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Address for correspondence: Prof. M.N. Marhatta, Editor-in-chief, Journal of Nepalgunj Medical College, Kohalpur, Nepal.
Tel No.: 081-540409 Fax No.: 00977-81-540409, **E-Mail:** ngmcjournal@gmail.com

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EDITORIAL

Medical Education during COVID-19 Crisis: Challenges and Opportunities

Marhatta MN

The new Coronavirus disease (COVID-19) was first identified in December 2019 in Wuhan, China. World Health Organization declared it as pandemic on March 11, 2020. It has spread all most everywhere in the world and has taken 1075750 lives till now. As of September 11, 2020 more than 107755 infected cases and 636 deaths have been reported in Nepal itself.

COVID-19 has severe impact to all spheres of life of the people worldwide. It has deep rooted negative effects not only to the health and well -being of the people but to the socioeconomic aspects of the nations. People have lost their job, productivity and income leading to economic crisis. Fear, anxiety depression insecurity, violation and psychosocial problems are increasing in the societies.

Education system of the country seems all most paralyzed. Medical education and health delivery system have been suffered a lot since the nationwide lockdown announcement by the Government to prevent spread of infection on 24th March 2020. The novel coronavirus disease-2019 pandemic has challenged the structure and delivery of undergraduate and graduate medical education.[1] Teaching learning activities and clinical postings are either shot down or drastically minimized. Educational institutions have been shut down all over the world for the safety of both students and communities. Social distancing measures hamper students from assembling in learning labs, lecture halls, or small-group rooms and interacting in person.[2]

Inadequate protective facilities, direct prolong exposure to COVID-19 positive cases and asymptomatic cases in the closed working environment and limited health human resources are the major factors contributing to high infection rate in the Health institutions. The Government has instructed to designate 20% beds in private and 33% beds in Medical Colleges Teaching Hospitals for COVID-19 patient management. The same faculties, residents and other health professionals are bound to provide health care services to both COVID and non-COVOID patients in the same health care settings, facilities and hospitals. There is shortage of health professionals due to additional COVID-19 burden on top of regular clinical work with continuous academic activities and by their own sickness, COVID-19 positive status, quarantine and isolation. Recently after release of nationwide lockdown COVID-19 infection rate is getting higher. The infection rate is much higher among the health professionals working in the hospitals and medical colleges. Huge number of faculty teachers, residents, Interns, nurses and other coworkers already are infected. Some health institutes have reported to have as high as 25% health care workers (HCW) infected. While health workers represent less than 3% of the population in the large majority of countries and less than 2% in almost all low- and middle-income countries, around 14% of COVID-19 cases reported to WHO are among health workers.[3]

COVID-19 crisis has been unique experience for both the faculties and trainees. This has been an opportunity to learn epidemiological aspects, preventive measures, self-protection techniques and the importance of health education to the communities against deadly infectious diseases. It also has taught how to continue Health Professionals academic training and provide health care services during adverse situation and crisis. Many modifications and accommodations has been adopted in the academic programs, teaching learning techniques and time period. The challenge is to maintain quality and standard of medical education so that the future health professionals can have acquisition of adequate knowledge, skills, positive attitudes professionalism and competencies.

Kathmandu University has encouraged to its affiliated colleges to implement Internet based academic activities especially during COVID-19 lockdown period when there was shot down of clinical and class based teaching. After a month of lockdown the theoretical aspects of academic activities was gradually resumed with the new modalities of distance teaching using online technology for the undergraduate training. It has kept the student attached with their course and engaged with educational activities. PG residents and interns were continued with their clinical posting however the teaching were compromised a lot in the new chaotic and uncertain environment since many of the faculties and residents were posted as front-liner on COVID-19 management.

Challenges to medical education during the coronavirus disease-2019 era include engagement over video conferencing and social media platforms, balancing of home and work life, and heightened concerns for provider burnout.[1] Technology based medical education already has been a main stay for teaching learning activities during the current COVID-19 crisis. Recently online approaches were applied successfully to conduct both the internal assessment and the final practical examination in the KU affiliated Colleges including Nepalgunj Medical College.

Online learning platforms now offer many opportunities that are being widely used by medical collages around the world, comprising of adoptive tutorials, online videos, webcasts, video-conferencing, and virtual models. The range extends from websites, discussions forums, and online discussion

spaces to real time online chat and a variety of communication apps.[4] Classroom lectures and tutorials are replaced by online lectures and interactive webinars subsequently.

There has been transformation of medical education and health service system in the form of online teaching and telemedicine in some extend. But these measures have their own limitation that they cannot meet the whole educational objectives of the medical teaching as per university curriculum. Some faculties and students are unable to participate in the teaching learning activities either due to unavailability of good access or inadequately motivated towards the technology driven education system. Most of the classes are one way lectures or slide presentations without interaction and feeling of live presence. The participation of students was encouraging in the initial days and is gradually declining since they lost the interest to the monotonous blind one way teaching. This problem can be solved by making classes more interactive and attractive by using appropriate version of Internet facilities depending upon the objective of subject matter and discipline. It is mandatory to upgrade internet facilities and to have updated soft were programs.

Online teaching lacks hands on training, interaction with the patient, their examination, communication and counseling and the team spirit which are so important to develop clinical skills and professional competencies. The important of human touch in clinical teaching learning cannot fade away but the opportunities for the students will be far less than the pre-COVID-19 era. Online teaching is an accepted alternative and the process of paradigm shift has already started globally.[5] The replacement of in-person classes with online equivalents is an obvious necessity at this time but creates a loss of collaborative experiences that has the potential to be a significant detriment to education. Likewise, the cancellation of clerkships, which are necessary for both skill acquisition as well as for relationship building, is a serious issue which students and medical schools must now resolve.[6]

Medical education seems to be more dependent on the internet technologies in the post COVID-19 era and further. The Government must extend the internet access to the remote and rural communities either. Similarly the medical colleges must give due attention to develop internet infrastructure, capacity building and teachers training for ongoing and future wave-based education.

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Clinical Spectrum- Cognition, Stages, Functionality among Elderly with Dementia: A Cross-Sectional Study

Niroula N

ABSTRACT

Introduction: Although cognitive and functional impairment are the hallmark features of Dementia but it is often undetected and neglected as a normal part of aging. So we conducted this study on clinical profile of dementia patients. **Aim**: The aim of this study is to evaluate the Patient's cognitive impairment, functional capacities, and stages of severity of dementia. **Methods:** A descriptive cross sectional study was conducted among 50 patients aged 60 years and above, of both sexes with the diagnosis of Dementia, admitted in Medicine ward of Nepalgunj Medical College, Nepalgunj, Nepal. The screening of dementia was done using Mini-Mental State Examination tool and the diagnosis of Dementia was confirmed using the International Classification of Disease-10 Diagnostic Criteria for Research. Cognition, functionality and stages of severity of dementia were assessed using Hierarchic Dementia Scale, Functional Autonomy Measurement System, Functional Assessment Staging Test tools respectively. **Results:** Among a total of 50 dementia patients, the mean and standard deviation of age was 82.4**±6.1 years, majority of cases** 60 % were in the age group ≥85 years and most patients were female 56%. The mean Mini-Mental State Examination score was 9.6±3.0, and 50 % had severe impairment of cognition on Hierarchic Dementia Scale. Stage 7 dementia 32 % was most prevalent stage on Functional Assessment Staging and severe deterioration in the functional autonomy was seen in 54% dementia patients (score ≥41 on Functional Autonomy Measurement System). **Conclusion:** This study concludes that significant number of elderly patients attending tertiary care hospital suffers from dementia with severe impairment in cognition and functionality in various stages of dementia in the elderly patients.

Keywords: **Alzheimer's disease, Cognition, Dementia, Mini Mental State Examination, Neurocognitive disorders**

Author:

1. Dr. Niju Niroula

Address for Correspondence:

Dr. Niju Niroula
Department of Medicine
Nepalgunj Medical College and Teaching Hospital
Nepalgunj, Banke, Nepal
E-mail: dr.nijuniroula@gmail.com

INTRODUCTION

Dementia also referred as Neurocognitivedisorders (NCDs) is adegenerative disease of brain characterizedby progressive impairment of memory, communication skills, planning and personalorganizational ability, and social skills leadingto the progressive decline in the activities ofdaily living and loss of independence. Thecognitive deficits interfere with independencein everyday activities of daily living providinggreat burden for the family members or caretakers.[1]

The most common form of dementia is Alzheimer's disease (AD), accounting for 60 to 80% of dementia cases. Vascular dementia (VaD), which occurs after a stroke, is the second most common form, accounting for about 10% of cases. Other types include mixed dementia, dementia with Lewy bodies, and frontotemporal dementia.[2] Dementia is mostly diagnosed in people over 65 years, but a less prevalent early onset form sometimes develops at earlier age group.[3] Dementia leads to patient's unusual behaviors, aggression, agitation, forgetting, repetitive questions, culturally inappropriate behaviors, sexual disinhibition, and/or shadowing.[4] The progressive course of dementia might be classified in three main stages: mild stage- there is still some aptitude for independent life, despite the impact on instrumental activities of daily living; moderate stage- the abilities for independent living are limited and supervision is needed in many activities; severe stage- restricted independence for all activities, including personal hygiene, limited language skills, sometimes with mutism, and often apathy.[5] Cognitive impairment, even in the mild stages, is a major cause of disability in dementia.[6]

Functional decline, defined as deterioration in self-care skills, is a common and devastating problem for elderly patients with dementia.[7, 8] It is associated with prolonged hospital stay, increased mortality, higher rates of institutionalization, and greater health care expenditure. Recent studies suggested that 34 to 50% of elderly patients experienced functional decline in dementia.[9,10] The prevalence of dementia is increasing

globally.[11,12] It approximately doubles every 5 years in individuals aged 65 to 85 years; from approximately 1% to 2% at 65 years, to more than 30% to 50% by age 85 years.[11] About 46.8 million persons suffer from dementia worldwide.[13] This number is expected to increase to 74.7 million persons by 2030 and to 131.5 million by 2050.[14] In Nepal except hospital based study we don't have prevalence data butbased on elderly population withat least 5% prevalence of Dementia among 2.7 million elderly populations in the country as per2011 National census it can be estimated thatthere can be at least 135,000 people suffering fromdementia.[15]The hospital based study conducted in outpatient departmentin Kathmandu, Nepalhad shown prevalence of dementia as 11% of which 6% was vascular dementia and 5% Alzheimer's dementia.[16], while another study done in a tertiary-care hospital in eastern Nepal in elderly had reported prevalence of dementia as 6%.[17]

Most studies employ superficial screening tests and rarely monitor functionality or qualitative aspects in dementia patients.[18, 19]Only a few studies have used a performance-based measure, in which the patient is actually observed and objectively rated on his or her ability to perform various activities of daily living.[20]In view of the scarcity of studies done in Nepal that precisely evaluate cognitive and (performance-based) functional abilities of dementia patients, we conducted this study on clinical profile of dementia patients with the aim to evaluate their cognitive impairment, functional capacities, and stages of severity of dementia.

METHODS

This was a descriptive cross-sectional study conducted among 50patients of aged 60 years and above, of both sexes with the diagnosis of Dementia, admitted in Medicine ward of Nepalgunj Medical College, Nepalgunj, Banke, Nepal, from 25th May 2018 to 25th May 2020 following all appropriate institutional ethics committee clearances. Informed consent was taken from the patients and when they were not able to provide consent because of disease severity, the consent was taken from their relatives. For inclusion, each patient who had scored 24 on the traditional Mini-Mental State Examination–MMSE[21]and who fulfilled the ICD-10 DCR[22]criteria for the diagnosis of Dementia, were enrolled into the study. A self-designed semi structured questionnaire was used to obtain the socio-demographic characteristics of the study population.

Each patient after initially scored on MMSE,were then screened for an accurate stratification of cognition using Hierarchic Dementia Scale (HDS).[23]This instrument consists of 20 subscales assessing a broad spectrum of cognitive abilities. The subscales comprise either five or 10 items in decreasing order of difficulty. On each subscale, the maximum score is 10, which suggests no impairment. Results between 7 and 9 suggest mild impairment; results between 4 and 6 suggest moderate impairment; finally, results between 0 and 3 suggest severe impairment. The maximum total score on the HDS is 200 points. Older adults who are cognitively intact generally achieve the maximum or close to maximum score.[24] Even patients with severe dementia are often able to answer correctly the easiest items on the lower end of a subtest.[25] The validity and reliability of the scale are well established.[26]

Stages of severity of dementia wereassessed by the Functional Assessment Staging Test–FAST,[27] a hierarchical scale consisting of 16 items. Scores range from normality (FAST stage 1) to severe dementia (FAST stage 7). FAST stages 6 and 7 are subdivided into five and six sub stages, respectively.Reliability andvalidity studies have been performed and showed satisfactory results.[28]

To evaluate the patient's functional capacities, the Functional Autonomy Measurement System (SMAF) was administered.[29]This 29-item scale measures functional ability in five areas: activities of daily living (ADL: 7 items), mobility (6 items), communication (3 items), mental functions (5 items) and instrumental activities of daily living (IADL: 8 items). The disability for each item is scored on a 5-point scale: 0 = independent, 0.5 = with difficulty, 1 = with supervision, 2 = with help and 3 = dependent. Higher score is indicative of severe autonomy impairment.This version of the scale has shown good test-retest and inter-rater reliability.[30]Data were analyzed using SPSS version16 (Chicago, Illinois, USA). Descriptive analysis was performed.

RESULTS

Among a total of 50 dementia patients (Alzheimer's dementia 44 (88%) and Vascular dementia 6 (12%) included in this study, females 28 (56%) outnumbered males22 (44%). The mean and SD of age of patients was 82.4 **±6.1** years, majority of cases 60 % were in the age group 85 years and above.Dementia was found more than 3 times higher in rural populations (78%) than in urban populations (22%).The risk of dementia was considerably higher among those with no formal education (62%), compared to those with primary (18%) or secondary (12%) or Higher secondary/above (8%). There was a considerably higher prevalence of dementia among respondents who were unemployed (60%) compared to those who were employed/retired (40%). (Table-I)

Variables		Frequency % n=50
Age in years	65–74	8 (16%)
	75–84	12 (24%)
	≥ 85	30 (60%)
Gender	Male	22 (44%)
	Female	28 (56%)
Residence	Urban	11 (22%)
	Rural	39 (78%)
Education	Illiterate	31 (62%)
	Primary	9 (18%)
	Secondary	6 (12%)
	Higher Secondary and above	4 (8%)
Occupation	Employed or retired	20 (40%)
	Unemployed	30 (60%)

Table I : Distribution on the basis of socio demographic variables

Regarding screening for cognition, initial traditionalMMSE mean result was 9.6±3.0. Then the further stratification of cognition using Hierarchic Dementia Scale-HDS showed 25 (50%) patients had severe impairment of cognition.More than two third of the dementia patients 27 (54 %) showed severe deterioration in their functional autonomy (score ≥41 on the Functional Autonomy Measurement System-SMAF). (Table-II)

Variables		Frequency % n=50
Cognition (HDS)	0-3 (Severe impairment)	25 (50%)
	4-6 (Moderate impairment)	16 (32%)
	7-9 (Mild impairment)	9 (18%)
Functionality (SMAF)	0-29 (No to mild dependency)	8 (16%)
	29.1- 40 (Moderate dependency)	15 (30%)
	≥ 41 (Severe dependency)	27 (54%)

Table II : Distribution on the basis of Cognition and Functionality

The different categories of stages of dementia in Functional Assessment Staging Test-FAST showed that the stage 7 dementia 32% was the most prevalent stage of dementia. Results can be seen in Table-III.

Stages of dementia (FAST)		Frequency % n=50
Mild dementia	Stage 4 (IADLs becomes affected)	9 (18%)
Moderate dementia	Stage 5 (Needs help selecting proper attire)	15 (30%)
Moderately Severe dementia	Stage 6	10 (20%)
	6a (Needs help putting on clothes)	5 (10%)
	6b (Needs help bathing)	3 (6%)
	6c (Needs help toileting)	2 (4%)
Severe dementia	Stage 7	16 (32%)
	7a (Speaks 5-6 words during day)	12 (24%)
	7b (Speaks only 1 word clearly)	4 (8%)

Table III : Distribution on the basis of Stages of dementia

DISCUSSION

In our research among a total of 50 patients, dementia prevalence increased with age, mean age of presentation was 82.4±6.1 years. The figure rose from 16% for patients younger than 74years, 24% for younger than 84years to 60% for 85 years and beyond of age. This was consistent with the results of previous studies pointing out the association between age and prevalence of dementia.[31, 32]

The most common form of dementia in our study was Alzheimer's dementia (88%) followed by Vascular dementia (12%). Various epidemiological and clinical studies have reported AD as the most common cause of dementia followed by VaD.[33]

In the present study, 56% of patients with dementia were females while 44% were males. This result is in line with the findings of the majority of the previous research, which have reported higher rates of dementia in women. Similar gender differences were also reported in many studies.[34,35] The interaction between genes, hormones, and the social environment may be the main reasons for this difference between genders.[33] As life expectancy for women is higher than men and age is major risk factor for dementia, soincidence of dementia is higher in women[36]

Dementia was found more than 3 times higher in rural populations (78%) than in urban populations (22%) in our study. Many studies reported the association between living in rural place and risk of dementia. This may be due to the fact that patients from rural background were less educated as compared to urban and low level education has a higher risk of cognitive decline and dementia in people living in rural areas.[37,38]

The risk of dementia in our study was seen considerably higher among those with no formal education (62%), compared to those with primary (18%) or secondary (12%) or Higher secondary/above (8%). This is comparable to other studies which also suggest that higher education levels are associated with a reduced risk of cognitive decline and dementia.[39] The effect of education on the cognitive decline can be explained using the 'cognitive reserve hypothesis' with a positive correlation that a low level of education is related to an increased incidence of dementia.Mental and intellectually challenging activities involved in educational and complex mental activities is recognized as having a powerful role in maintaining or enhancing brain reserve and is thus protective against the risk of dementia in old age.[40]

Another point we would like to highlight about this study is that the rate of dementia prevalence was significantly lower among employed or retired individuals (40%) than unemployed patients (60%). Several studies have shown that not having an active job throughout one's life increases the risk of dementia due to a reduction in cognitive reserves.[41]

In our study the cognitive abilities assessedusing Hierarchic Dementia Scale showed 50% patients had severe impairment of cognition which is in line with the previous research where severe deficits in cognitive function was reported in dementia patients as assessed by HDS tool.[42]

The functional capacities of patients in our study wasseverely impaired, more than two third of the dementia patients 27 (54 %) showed severe deterioration in their functional autonomy (score ≥41 on the Functional Autonomy Measurement System-SMAF).Some cross-sectional studies have noted greater prevalence rates offunctional declineassociated with increasing age among older persons with dementia.[43,44,45]

The different categories of stages of dementia in Functional Assessment Staging Test-FAST in our study showed that the stage 7 dementia 32% was the most prevalent stage. These findings have been consistent with a study done in Korean patients, which elucidated 46% patients at Functional Assessment Staging Scale (FAST) stage 6d or above.[46] Similar results noted in other studies.[47,48]

LIMITATIONS

The findings in this study are based on a single center outpatient based samples, so generalization to other settings might not be appropriate. A larger sample size may be helpful to confirm the contributing factors. So, if we want to produce more accurate conclusion for our present study, we need to carry out this study over large number of samples from different regional part of Nepal. Further studies should be conducted with different samples using alternative measures, with the aim to find the same correlations or new results through the application of different statistical techniques.

CONCLUSION

This study concludes that significant number of elderly patients attending tertiary care hospital suffers from dementia with severe impairment in cognition and functionality. It shows the importance for clinical, multidisciplinary teams along with adequate diagnostic modalities to understand the stages of the dementia with progressive decline in cognitive and functional capacities which may help in a timely diagnosis and may direct future developments with regard to specific techniques to deal with dementia patients.

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ORIGINAL ARTICLE

Platelet Count and Its Prognostic Value in Pregnancy Induced Hypertension

Sharma N[1], Kumari S[2], BC D[1], Shrestha M[3]

ABSTRACT

Introduction: Hypertensive disorders of pregnancy is one of the maternal diseases that cause the most detrimental effects to the mother and the fetus.[1] It is the leading cause of direct maternal death along with hemorrhage and infections. Approximately 70% of hypertensive disorders are due to gestational hypertension, preeclampsia and eclampsia whereas other 30% are due to pre-existing or undiagnosed hypertension.[2] Out of all the hematological abnormalities that occur in PIH, thrombocytopenia is the most common seen to occur in 11% to 29% of patients.[3] Thrombocytopenia occurs more commonly in patients with eclampsia (30%) compared to patients with both mild and severe forms of pre-eclampsia (15%-18%).[4] **Aims :**To find out the severity of disease with platelet count in pregnancy induced hypertension. **Methods:** This is a hospital- based descriptive cross sectional study, conducted in the department of Obstetrics and Gynecology at Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke, Nepal, conducted over a period of one year from September 2018 to August 2019. Fifty pregnant women were enrolled in study after getting informed written consent and assessing for inclusion and exclusion criteria. **Results:** Incidence of Pre-eclampsia/eclampsia is 2.3% in this study. Majority of the women belong to age group 21-25(40%), followed by 15-20(38%) with mean age 23.18±5.45. 62% constituted primigravidas and 38% were multigravidas. 33 (66%) cases were at term (37-42 weeks of gestation), 11(22%) at 34-36 weeks of gestation and 6 (12%) were at 28-33 weeks of gestation with mean gestational age 36.38±3.17. Eclampsia cases were found more i.e. 48%, followed by pre-eclampsia 38% and Gestational hypertension 14%. Moderately low platelet count was seen in 11.76% of Gestational hypertension, 47% of pre-eclampsia and 41.17% of eclampsia and severely low platelet count in 21.4% pre-eclampsia and 64.70% of eclampsia. **Conclusion:** PIH continues to be a leading cause of Maternal and perinatal morbidity and Mortality. The disease accounts of 40,000 maternal deaths worldwide per year[5]. It is one of the common causes of iatrogenic preterm delivery. Etiology of Pre-eclampsia/Eclampsia is complex and not completely understood. A combination of abnormal Placentation and predisposing maternal factor contribute to widespread endothelial dysfunctions which lead to the syndrome of PIH. To date there has been no screening test that has been widely adopted in clinical practice. Platelet estimation method is reliable, rapid, cheaper, and simple lab method. Prognosis of diseases could be monitored by measuring platelet count and level of platelet count can predict the severity of PIH. Therefore assessment of platelet count has special place in management of PIH.

***Keywords*: Eclampsia, Preeclampsia, Thrombocytopenia**

Authors:

1. Dr. Nirmala Sharma
2. Dr. Sheela Kumari
3. Dr. Durga BC
4. Dr. Merina Shrestha

[1] Department of Obstetrics & Gynaecology, Nepalgunj Medical College & Teaching Hospital, Kohalpur, Banke

[2] Department of Obstetrics & Gynaecology, Lumbini Provincial Hospital, Lumbini, Rupandehi

[3] Department of Community Medicine, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

Address for Correspondence:

Dr. Nirmala Sharma
Department of Obstetrics & Gynecology
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: sapkota_neerusha@yahoo.com

INTRODUCTION

According to the WHO systemic review on maternal mortality worldwide, hypertensive disease remains a leading cause of direct maternal mortality, together with hemorrhage and infections; hypertension forms the deadly triad that contributes to morbidity and mortality during pregnancy and childbirth.[6]

This hypertensive disorder in pregnancy is known as pregnancy induced hypertension is defined as a sustained systolic blood pressure of 140 mm of Hg or more and a diastolic blood pressure of 90 mm of Hg or more for the first time after 20 weeks of gestation and disappear following delivery.[7] PIH is responsible for 14% of maternal deaths in the world.[8] The incidence of pregnancy induced hypertension is between (6 to

15) % in primigravidas and (2 to 4) % in multigravidas. Whereas incidence of preeclampsia is (5 to 7) % and eclampsia is (0.5 to 2) % of all pregnancies. The condition is more frequent in obese women and in women with multiple gestation, diabetes, chronic hypertension and previous history of preeclampsia.[9]

Pregnancy-induced Hypertension (PIH) is a syndrome of hypertension with proteinuria (Pre-eclampsia) or without proteinuria and edema, with the clinical manifestation usually occurring late in pregnancy and regressing after delivery of the conceptus.[10] Platelets are also called Thrombocytes, are a component of blood whose function is to stop bleeding by clumping and clotting blood vessel injuries.[11] A normal platelet count in a healthy individual is between 150,000 and 450,000 per µl (microliter) of blood (150–450 × 10^9/L). Ninety-five percent of healthy people will have platelet counts within this range.[12] In the pregnant women, thrombocytopenia is defined as a platelet count of less than 150×10^9/L. Counts of 100–150×10^9/L are defined as mild thrombocytopenia and counts of 50–100×10^9/L as moderate thrombocytopenia, while counts of less than 50×10^9/L known as severe thrombocytopenia. Either the decreased production or the increased destruction via any means causes thrombocytopenia. In pregnancy, increased platelet destruction may be mediated by immunological mechanisms, abnormal platelet activation, or platelet consumption.[13]

Out of all the hematological abnormalities that occur in PIH, thrombocytopenia is the most common seen to occur in 11% to 29% of patients.[14] Thrombocytopenia occurs more commonly in patients with eclampsia (30%) compared to patients with both mild and severe forms of pre-eclampsia (15%-18%).[15]

Lower the platelet count, greater are maternal and fetal morbidity and mortality.[7] It is found that thrombocytopenia increases the risk of perinatal complications such as abruptio placenta, preterm delivery, low Apgar score and stillbirth.[35] The degree of thrombocytopenia increases with severity of disease and the incidence of thrombocytopenia depends on the severity of the disease process.[20] Lower the platelet count, greater are maternal and fetal morbidity and mortality.[4] Overt thrombocytopenia, defined by platelet count<1 lakh/ µl indicates severity of diseases process where in most cases delivery is indicated because platelet number continues to decrease after that.[1] HELLP Syndrome (Hemolysis, Elevated Liver enzyme i.e. bilirubin>1.2mg/dl LDH>600U/L, Serum AST>70U/L and Low Platelet count <1 Lakh/ µl) show poor fetal outcome and occurs in 2%–12% women with severe pre- eclampsia or eclampsia .[16, 1] Inadequate cytotrophoblast invasion that occurs in pre-eclampsia may constitute the impetus to endothelial cell dysfunction and increased activation of platelets. There is increased platelets consumption because of uncontrolled intravascular platelets activation and fibrin deposition in hypertension in pregnancy.[36,37] The contact of platelets with the injured endothelium may represent the initial step of a coagulation cascade which leads to increased consumption of platelets in the utero placental circulation with resultant reduction in the number of circulating platelets in the first phase of the process. Subsequently, there may be a compensatory increase in bone marrow production. In fact, there is evidence that in PIH, the platelets production time is significantly reduced in comparison with normal pregnancies; Young platelets thrown in circulation are bigger and present a higher tendency to aggregation.[17, 18]

METHODS

This is a hospital based descriptive cross sectional study. Sample was taken by convenient sampling method till desired size reached. Fifty pregnant women were enrolled in the study**.** This study was conducted in the department of Obstetrics and Gynecology at Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke, Nepal, over a period of one year, September 2018 to August 2019. Pregnant women, primigravidas and multigravidas visiting Department of Obstetrics and Gynecology or Labor room after 20 weeks of gestation, may or may not be in labour with history of hypertension i.e. systolic BP ≥ 140mm of Hg and diastolic BP ≥ 90 mm of Hg were enrolled after getting informed written consent and assessing for inclusion and exclusion criteria. A detail history was taken regarding chief complaint, history of present and past illness, family history, personal history, menstrual history, obstetrics history, contraceptive history. A thorough general examination with reference to pulse, BP, Temperature, Respiratory Rate followed by systemic examination included CVS, Respiratory, Per Abdominal and Per Vaginal examination was done. All the routine ANC investigations i.e. Hb%, blood grouping and Rh typing, RBS, HBsAg, HIV, VDRL, Routine Urine, Urine Albumin, 24 hr. urine protein monitoring, BT, CT, PT, INR, RFT, LFT, platelet count by automated hematology analyzer and by Peripheral Blood Smear and Ultrasonography for obstetrics scan for fetal assessment as well as abdominal pelvic scan was done to rule out other causes of hypertension. OPD patient was regularly followed up till delivery, in each ANC visit where BP, platelet count was monitored. All the collected data were entered in Microsoft Office Excel worksheet. The statistical analysis was done after consultation with expert statistician advice using Statistical Package for Social Science (SPSS) version 20. The level for significance was set as $p < 0.05$. The statistical test significance (chi square) was applied to find p value and relevant other tests were also used whenever required. $p < 0.05$ was considered statistically significant.

Inclusion criteria:

All pregnant women, both primigravidas and multigravidas, may or may not be in labour, with hypertension of Pregnancy after 20 weeks of pregnancy visiting department of Obstetrics and Gynecology.

Exclusion criteria:

1. Previous history of hypertension
2. Previous history of Diabetes mellitus
3. Previous history of renal disease
4. Previous history of thyroid disorder
5. Any type of anemia
6. Taking any medications which can affect platelet count and cause bone marrow depression except for vitamins, iron and calcium

RESULTS

The age of the women, in this study majority of the women belong to age group 21-25(40%) followed by 15-20 (38%) with mean age 23.18±5.45 (Fig 1)

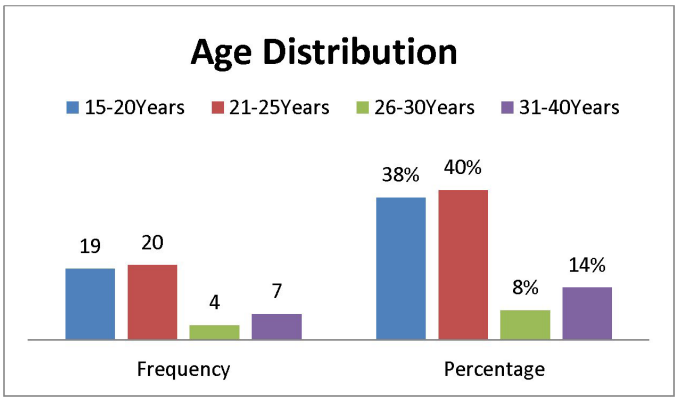

Figure 1

Gravidity:

In this study maximum number of women 62% constituted primigravidas only 38% were multigravidas.

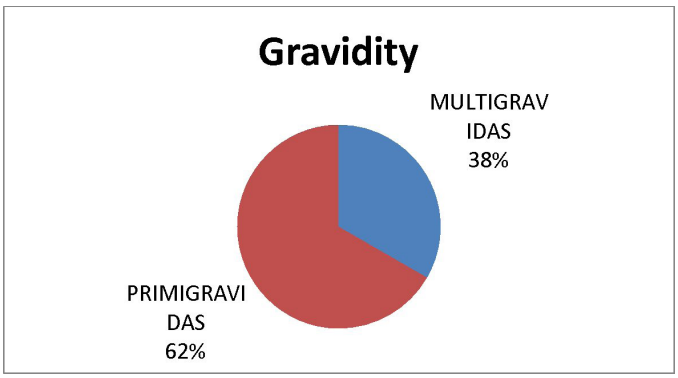

Figure 2

Gestational Age:

In this study, out of 50 cases 33 (66%) cases were at term (37-42 weeks of gestation), 11(22%) at 34-36 weeks of gestation and 6(12%) are at 28-33 weeks of gestation with mean gestational age is 36.38±3.17 as shown in figure 3.

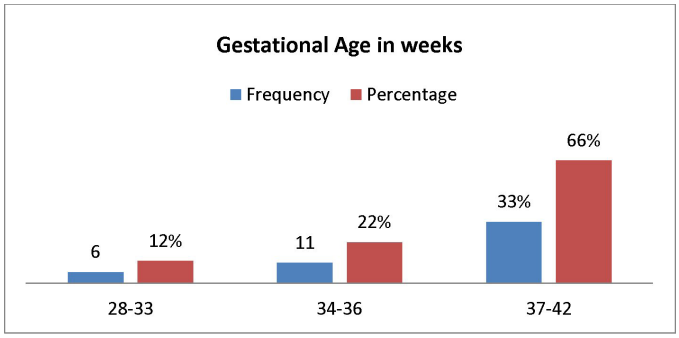

Figure 3

Pregnancy Induced Hypertension

In this study, eclampsia cases were found more i.e. 48% followed by pre-eclampsia 38% and Gestational hypertension 14% as shown in fig 4

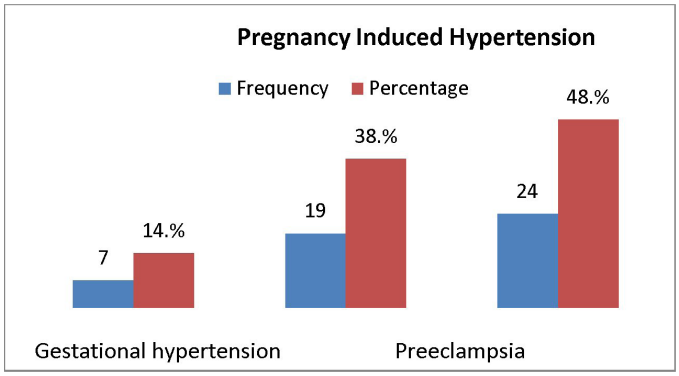

Figure 4

Relation of PIH with Platelet Count

In this study, moderately low platelet count was seen in 11.76% of Gestational hypertension, 47% of pre-eclampsia and 41.17% of eclampsia and severely low platelet count in 21.4% pre-eclampsia and 64.70% of eclampsia as shown in Fig 5.

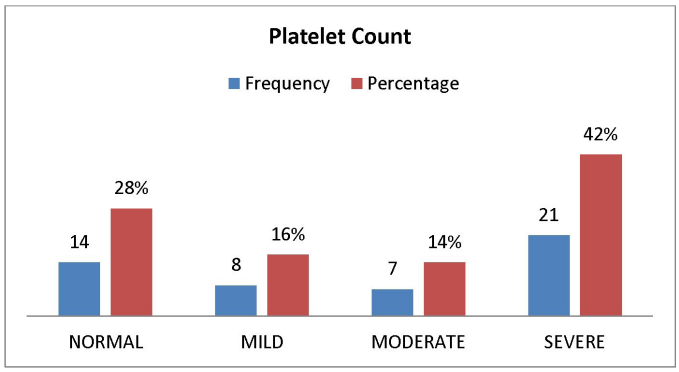

Figure 5

Mode of Delivery:

In this study, 54% cases had vaginal deliveries and 46% underwent caesarean section which is shown in table I.

Vaginal 27 (54 %)			Caesarean Section 23(46%)		
	Frequency	Percentage		Frequency	Percentage
SVD	20	74.07%	Non progress of labour	5	21.73%
Vacuum	4	14.81%	Oligohy-dramnios	2	8.69%
			Failed Induction	6	26.0%
Forceps	3	11.11%	Fetal Distress	10	43.47%
Total	**27**	**100**	**Total**	**23**	**100**

Table I : Distribution of cases according to Severity of PIH

Age group in years	PIH			Total	p value
	Gestational hypertension	Pre-eclampsia	Eclampsia		
15-20	0 0%	7 (36.84%)	12 (50%)	19	0.096
21-26	4 (57%)	7 (36.84%)	9 (37.5%)	20	
27-30	0 0%	2 (10.5%)	2 (8.33%)	4	
31-40	3 (42.85%)	3 (15.78%)	1 (4.16%)	7	
Total	**7**	**19**	**24**	**50**	

Table II

p value is 0.096 which is statistically not significant.

Severity of PIH with Gestational age in Weeks

PIH	Gestational Age In Weeks			Total	P Value
	28 - 33	34 - 36	37- 42		
Gestational hypertension	0 (0%)	3 (27.27%)	4 (12.12%)	7	0.039
Pre-eclampsia	1 (16.66%)	1 (9.09%)	17 (51.51%)	19	
Eclampsia	5 (83.33%)	7 (63.63%)	12 (36.36%)	24	
Total	6	11	33	50	

Table III

p value is 0.039 which is statistically significant.

Severity of PIH with Platelet Count

PIH	Platelet Count			Severe	Total	p Value
	Normal	Mild	Moderate			
Gestational hypertension	3 (33.33%)	3 (30%)	2 (11.76%)	0	8	0.057
Pre-eclampsia	3 (33.33%)	5 (50%)	8 (47%)	3 (21.4%)	19	
Eclampsia	3 (33.33%)	2 (20%)	7 (41.17%)	11 (64.70%)	23	
Total	9	10	17	14	50	

Table IV

Above shows that severe thrombocytopenia seen in women with preeclampsia and eclampsia.

Distribution of cases according to Platelet Count

Severity of thrombocytopenia with maternal age

Maternal Age (Years)	Platelet Count				Total	p Value
	Normal	Mild	Moderate	Severe		
15-20	3 (27.27%)	4 (40%)	5 (38.46%)	7 (43.75%)	19	0.280
21-25	7 (63.63%)	5 (50%)	4 (30.76%)	4 (25%)	20	
26-30	0	0	3 (23.07%)	1 (6.25%)	4	
31-40	1 (9.09%)	1 (10%)	1 (7.69%)	4 (25%)	7	
Total	**11**	**10**	**13**	**16**	**50**	

Table V

Severity of Thrombocytopenia with Maternal Outcome

Maternal Outcome	Platelet Count				Total	P Value
	Normal	Mild	Moderate	Severe		
No Complication	13 (92.85%)	8	3 (42.85%)	9 (42.85%)	33	0.023
PPH	0	0	1 (14.28%)	4 (19.04%)	5	
Abruptio placenta	0	0	2 (28.57%)	1 (4.76%)	3	
Intracranial Haemorrhage	0	0	1 (14.28%)	2 (9.52%)	3	
HELLP Syndrome	1 (7.14%)	0	0	5 (23.80%)	6	
Total	**14**	**8**	**7**	**21**	**50**	

Table VI

Table above shows more cases of PPH and HELLP syndrome are seen in pregnant women with severe thrombocytopenia.

Severity of Thrombocytopenia with Fetal Outcome

Fetal Outcome	Platelet Count				Total	p Value
	Normal	mild	moderate	severe		
Term Fetus	9 (81.81%)	12 (80%)	3 (30%)	2 (14.28%)	26	0.015
IUGR	1 (9.09%)	0	2 (20%)	3 (21.42%)	6	
IUFD	0	1 (6.66%)	1 (10%)	5 (35.71%)	7	
Preterm Fetus	1 (9.09%)	2 (13.33%)	4 (40%)	3 (21.42%)	10	
Early Neonatal Death	0	0	0	1 (7.14%)	1	
Total	**11**	**15**	**10**	**14**	**50**	

Table VII

Table above shows that IUGR, IUFD and Early neonatal death are mainly seen in women with severe thrombocytopenia.

DISCUSSION

Hypertensive disorders which include preeclampsia/ eclampsia represent a significant proportion of maternal deaths worldwide. Such deaths account 9.1%, 9.1% and 25.7% in Sub-Saharan Africa, South Asia, and Latin America respectively.[19] In Nepal, maternal death due to eclampsia accounts for 14%.[20] Nepal maternal mortality and morbidity study 2008-09 showed that preeclampsia/eclampsia is the second most common cause of maternal mortality.[21] Incidence of Pre-eclampsia/ eclampsia in developing countries is 0.94% to 1.8%.[22]

Whereas incidence is 2.3% in this study. As regards the age of the women, in this study majority of the women belongs to age group 21-25(40%) followed by 15-20(38%) with mean age 23.18±5.45.This is similar to the study done by Rahim R (2010)[23] and Rabia Prabin Sidiqui (2015)[24] with mean age 23.12 and 23.45±3.25 respectively.

In this study, maximum number of women 62% constituted primigravidas, only 38% were multigravidas that is similar to study done by Nirmala T(2015)[25], Feroza Sultana (2015)[26] and Shaiza Riaz et al(2011)[27] where 61%, 63% and 60% cases women affected were primigravidas respectively.

In this study, out of 50 cases, 33 (66%) cases were at term (37-42 weeks of gestation), 11(22%) at 34-36 weeks of gestation and 6(12%) are at 28-33 weeks of gestation with mean gestational age is 36.38±3.17, similar result were observed by Chaudhary P(2003)[27], 72.34% cases were at term whereas relatively more cases occurred before 37 completed weeks in the study done by Douglas L A. (1994).[28] In this study, eclampsia cases were found more i.e. 48% followed by pre-eclampsia 38% and Gestational hypertension 14%. In a study from Bhopal by Anand and Kirshnanand et al[29] majority of the cases had preeclampsia (66.36%) and the rest eclampsia (33.64%). In this study, moderately low platelet count was seen in 11.76% of Gestational Hypertension, 47% of pre-eclampsia and 41.17% of eclampsia and severely low platelet count in 21.4% pre-eclampsia and 64.70% of eclampsia. Which is similar to study by Khan A et al (2014)[30] with lowered platelet count 29.31% in pre-eclampsia and 44.44% in eclampsia.

In this study, 54% cases had vaginal deliveries and 46% underwent caesarean section, which is comparable to study done by Kuljit Kaur (2014)[31] where 35% had caesarean section.

In this study, Fetal Distress and Non Progress of Labour were the most common causes of caesarean sections i.e. (43.47%) and (21.73%) which is comparable to the study done by Singhal et al (2009), which reported (32%) of caesarean sections out of their total 100 cases of pre-eclampsia and fetal distress was the most common indication of caesarean section (59.28%) followed by Non Progress Of Labour (12.5%.)[32]

In this study, the most common maternal complication was HELLP syndrome (12%) followed by PPH (10%), Abruptio Placenta (6%) and Intracranial hemorrhage due to DIC (6%), similar to study done by Meshram et al (2014)[33] who observed HELLP syndrome in (10.6%) cases, PPH in (8.5%) and DIC in (3%) cases. In this study (54%) babies have birth weight ≤ 2.5 kg, (12%) with IUGR, (14%) with IUFD, (20%) Premature babies and (2%) Early neonatal death. Rahim R (2010)[23] found (74.28%) babies with low birth weight in patient with low platelet count. A study by Shahla K (2014)[34] found (17.3%) babies born to hypertensive mother had birth weight less than 2500gm in (17.3%), (5.5%) had birth weight less than 1500 gm, IUGR in (9.8%) cases, IUFD in (5.5%) cases and neonatal death in (6.1%) cases.

LIMITATIONS

- As the pathophysiology of PIH is complex and elusive so exact prediction of prognosis of disease still remains a challenge, there is no single marker or lab investigation which can strongly predict the prognosis of disease. So future research in this field is necessary.
- Sample size is small to give the exact representation of the general population.

CONCLUSION

HELLP syndrome complicates almost 20% of women with severe pre-eclampsia and eclampsia. Best markers to be followed are maternal platelet count and lactate dehydrogenase level. Prompt recognition and timely initiation of therapy are vital to ensure best outcome for both mother and fetus. Up to 50% of patients with pre-eclampsia /eclampsia developed thrombocytopenia. Severity is generally proportional to the underlying disease. In this study, severe thrombocytopenia contributed to poor maternal outcome with significant P value of 0.023. As well as fetal outcome was affected by increasing severity of thrombocytopenia with significant p value of 0.015. Hence it emphasizes on the importance of early recognition of thrombocytopenia for management of PIH ensuring safety to both baby and mother.

As PIH is an important complication of pregnant mother in developing countries. In Nepal maternal mortality due to eclampsia is 14% and second most common cause of maternal mortality and morbidity. Though prognosis of PIH is unpredictable, there are several laboratory investigations which were done in different studies like platelet aggregation test, platelet reactivity, serum level of LDH and transaminase, coagulation profile (BT, CT, PT aPTT) Platelet indices (MPV, Platelet Distribution width, platelet count) which predict the prognosis of disease. Besides that comparison study between platelet count and platelet indices can also be done to predict prognosis of PIH. Special focus should be given regarding health education and emphasizing regular ANC visits, correction

of anemia and infection, proper balance diet, calcium and micronutrient supplementation. In addition socio-economic status should be improved. As emphasized earlier, out of many tests, platelet estimation method is reliable, rapid, cheaper, and simple lab method which does not require sophisticated lab setup, highly skilled manpower. Prognosis of diseases could be monitored by measuring platelet count and level of platelet count can predict the severity of PIH. Therefore assessment of platelet count has special place in management of PIH.

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Effectiveness of Autologous Blood and Steroid Injection in Tennis Elbow Based on Visual Analog Score Pain Score and Nirschl Stage

DC GS

ABSTRACT

Introduction: Lateral epicondylitis or Tennis elbow is one of the most common causes of lateral elbow pain. Local steroid injection is a time tested treatment for providing symptomatic relief. Local injection of autologous blood in a case of lateral epicondylitis provides pain relief due to its cellular and humoral factor and triggers a healing cascade. **Aim:** This study aims to compare the outcomes of the autologous blood injection and local corticosteroid injection in the treatment of tennis elbow. **Methods:** This is a Hospital based study on conducted in the Department of Orthopedics at Nepalgunj Medical College from July 2018 to June 2019. 42 patients with unilateral tennis elbow were divided into two groups-Group A-21 patients (Autologous Blood Injection) and Group B-21 patients (Steroid Injection). Group A received 2 ml of autologous venous blood and mixed with 1 ml of 2% lignocaine solution; Group B patients received 80 mg (in 2 ml) of methyl Prednisolone acetate and 1ml of 2% lignocaine solution. Visual Analogue Scale pain score and Nirschl stage of patients were evaluated before injection and at 2, 6, and 12 weeks of injection were noted and analyzed. **Results**: Preinjection mean VAS pain score was - 7.48±0.75, 7.52±0.68 in Group A, and Group B respectively while the Nirschl stage was 5.62±0.59 and 5.6±0.5 in group A and B, these scores among two group was not statistically significant. At 2 weeks follow up both groups showed improvement without any significant difference between two groups (p=0.84 and 0.549), while group A had better improvement in VAS pain score at 6 weeks (p=0.001). At 12 weeks follow-up within each group, there was significant VAS pain and Nirschl stage improvement (p=0.001) but there was no significant difference between the two groups. **Conclusion:** Injection of autologous blood and corticosteroid injection is equally effective in the treatment of Tennis elbow at 12 weeks final follow-up.

Keywords: **Autologous Blood Patch, Lateral Epicondylitis, Steroid, Tennis Elbow**

Author:

1. Dr. Gopal Sagar DC

Address for Correspondence:

Dr. Gopal Sagar DC
Department of Orthopedics
Nepalgunj Medical College and Teaching Hospital
Nepalgunj, Banke, Nepal
Email: sagargopal@gmail.com

INTRODUCTION

Lateral epicondylitis or tennis elbow is a common cause of lateral elbow pain, with a prevalence of 1% to 3% in the general population.[1,2] It is considered a degenerative process (rather than an inflammatory process.[3] Histopathology shows-neovascularization (angiofibroblastic hyperplasia) and fibroblastic degeneration within the substance of extensor tendons, particularly affecting the extensor carpi radial is brevis[4].Despite short term pain relief after local injection of steroid,[5,6] it provides no advantage over exercise and physiotherapy in the long term. [7] Recent studies have shown that Autologous blood injection is effective in the treatment of tennis elbow as it provides necessary growth factors to the site of disease which helps in the healing of local degenerative changes.[8,9] Autologous blood injection is cost effective and safer compared to steroid injection. There are few studies that compares there outcomes in treatment of tennis elbow. So we designed this prospective study to compare and evaluate their effectiveness in our study.

METHODS

This is a Hospital based study on the treatment outcome of tennis elbow conducted in the Department of Orthopedics at Nepalgunj Medical College from July 2018 to June 2019.

Patient with complaints of lateral elbow pain was diagnosed with tennis elbow based on the presence of all there signs. [10, 11]

1. Tenderness on palpation of the lateral epicondyle and the Common Extensor Origin.
2. Tenderness in the Common Extensor Origin during resisted extension of the wrist or the third Finger.
3. Tenderness on maximum gripping strength.

Patients with a clinical diagnosis of tennis elbow with age more than 20 years and without a history of previous treatment for this condition were included in the study. Exclusion criteria were: (1) Bilateral tennis elbow case. (2) Previous intervention for tennis elbow. (3) History of significant trauma to the elbow. (4)High blood sugar level. (5)Presence of other elbow ailments causing lateral elbow pain. Written informed consent was taken for all eligible cases and proforma was filled taking details of age, sex, occupation, duration of symptoms, Visual Analogue scale (VAS)pain score, and degree of disability by Nirschl stage of tennis elbow [12] was recorded and entered in excel sheet. Patients with unilateral tennis elbow were allotted to two groups on alternate case basis (case 1 autologous blood injection group, case 2 steroid injection group, and so on) Group A-Autologous Blood Injection group and Group B-Steroid Injection group.

Group A patient - with aseptic precautions 2 ml of autologous venous blood drawn from the antecubital vein, mixed with 1 ml of 2% lignocaine in solution 3 cc syringe. It was then injected locally at the point of maximum tenderness over the lateral epicondyle. Group B patient-with aseptic precautions 80 mg (in 2ml) of methyl Prednisolone acetate and 1ml of 2% lignocaine solution prepared in 3cc syringe was locally injected at a maximal tender point in lateral epicondyle. After the procedure patient was advised to take Tab. Paracetamol 500mg PO SOS on day one and restrain from activities involving repetitive movements

of the wrist and elbow during the initial 2 weeks after injection. Follow up visit was arranged at 2, 6, and 12 weeks. In each visit, the VAS pain score and Nirschl stage were recorded.

Statistical analysis was done using SPSS V.19 software, continuous and categorical variables were compared using the Student's t-test and Chi-square test, respectively. Within-group differences were compared using the paired sample t-test and a p-value of <0.05 was considered statistically significant.

RESULTS

Group A and Group B patients were found similar in age, sex distribution, and laterality- thus two groups were homogenous. There was no statically significant difference in the VAS pain score and the Nirschl stage between these two groups. (Table I)

In Group A patient's VAS pain score improved from 7.48±0.75 to 0.95±0.74 at the final follow-up in 12 weeks. The Nirschl stage also improved from 5.62±0.59 to 1.19±0.64 at the final follow-up in 12 weeks. These were statistically significant (p=0.0001). (Table II)

In Group B patients VAS pain score improved from 7.52±0.68 to 0.71±0.64 at 12 weeks follow-up. Nirschl stage improved from 5.62±0.59 to 1.29±0.46 at 12 weeks follow-up. There was statistically significant (p=0.0001). (Table II)

Both groups showed improvement in symptoms after injection but while comparing between these two groups, there was no statistically significant difference except at 6 weeks follow-up Group A had significantly better improvement on VAS pain score compared to Group B(p=0.0001). (Table 3)

Age	Mean =37.62±6.15	Mean =34.9±6.43	0.12
Sex	Male/female=9/12	Male /female=11/10	0.35
Laterality	right/left=13/8	right/left=12/9	0.753
VAS pain	mean=7.48±0.75	7.52±0.68	0.89
Nirschl stage	mean=5.62±0.59	5.62±0.59	1

Table I: Comparison of Pre-injection demography, laterality, VAS pain score and Nirschl stage between Group A and Group B

Group A VAS pain Nirschl stage	7.48±0.75 5.62±0.59	5.14±0.727 4.67±0.65	3.68±0.75 3.19±0.69	0.95±0.74 1.19±0.64	**0.0001**
Group B VAS pain Nirschl stage	7.52±0.68 5.62±0.59	5.1±0.76 4.52±0.87	2.95±0.66 2.86±0.91	0.71±0.64 1.29±0.46	**0.0001**

Table II: Comparison of VAS pain score and Nirschl Stage in Pre-injection and at 2, 6 and 12 weeks follow-up in Group A and Group B

VAS pain (2 weeks) Nirschl stage (2weeks)	5.14±0.72 4.67±0.65	5.1±0.768 4.52±0.87	0.84 0.549
VAS Pain (6 weeks) Nirschl stage (6 weeks)	3.68±0.75 3.19±0.81	2.95±0.66 2.86±0.91	0.001 0.25
VAS pain (12 weeks) Nirschl stage (12 weeks)	0.95±0.74 1.19±0.40	0.71±0.64 1.29±0.463	0.289 0.474

Table III : Comparison of VAS pain and Nirschl Stage improvement after injection between two groups.

DISCUSSION

Tennis elbow or Lateral epicondylitis is a common cause of lateral elbow.[1, 2] It was initially assumed to be an inflammatory process, and thus corticosteroid injection was used.[13] However, histological studies have demonstrated non-inflammatory angiofibroblastic tendinosis, neovascularization, and mucoid degeneration in lateral epicondylitis specimens.[14,15] The presence of substance P, calcitonin gene-related peptide, and Neurokinin 1-receptors in tendon insertions may be related to pain.[14]

The reduction of these neuropeptides by corticosteroid injection can reduce the pain dramatically.[15] The mechanism of action of both autologous blood and platelet-rich plasma (PRP) is attributed to the degranulation of α granules of platelets releasing growth factors that play a role in tissue healing and regeneration.[16] However, the preparation of platelet concentrates requires specialized equipment which is both expensive and time-consuming. Autologous blood has a far easier and prompt application than PRP.[16]

In our study, autologous blood injection (Group A) and steroid injection (Group B) showed significant improvement

in pain and functional disability based on the VAS pain score and Nirschl stage in the follow-up. However, there was no significant difference between these two groups in at 2 weeks after injection, while the autologous blood group showed more marked improvement in VAS pain score at 6 weeks compared to the steroid injection group. The final outcome at 12 weeks follow-up was similar in both groups.

In a study by Naveen PR, autologous blood injection was found to be more effective than corticosteroid in terms of pain reduction & functional recovery at 6 months after injection, with 90% relieved of pain in the autologous blood group compared to only 45% in the corticosteroid group.[17] In 2003 Edwards and Calandruccio[18] reported 79% recovery after injecting autologous blood, in their prospective case series study. Karimi Mobarakeh et al.[19] had 85% good results with autologous blood injection. Connell et al.[20] in 2006 injected autologous blood for tennis elbow under ultrasonography guidance and had a 94.2% success rate in pain relief using VAS and Nirschl stage parameters.Thus in contrast to our study, most of the other studies show that autologous blood injection is more effective than steroid injection in tennis elbow.

LIMITATION

Limitation of our study was small sample size (n=42), short duration of follow-up -12 weeks post injection and lack of true randomization to match the two groups. Multicentric study with larger randomized sample and longer duration of follow-up can be carried out in our setup in future to validate results.

CONCLUSION

There is no statistically significant difference in VAS pain score and Nirschl stage in the final follow-up at 12 weeks between those patients who received autologous blood injection or steroid injection for tennis elbow. Thus autologous blood injection can be used as simple, cost-effective and safe method of treatment in tennis elbow in our setting.

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ORIGINAL ARTICLE

Incidence, Risk Factors and Immediate Outcome of Preterm Neonates: A Hospital Based Study

Acharya N[1], Poudel S[2]

ABSTRACT

Introduction: Preterm birth is defined as birth before 37 completed weeks of gestation. It is one of the leading cause of infant morbidity and mortality in the world. **Aim:** The study was aimed to find out the incidence, possible risk factors and outcome of inborn preterm babies till they were discharged from the hospital. **Methods**: This is a prospective hospital based study**.** A total of 100 preterm babies delivered in Nepalgunj Medical College Teaching Hospital, Kohalpur and admitted in Neonatal Intensive Care Unit (NICU) were studied. Preterms were divided into 2 groups extremely to very preterm (<32 weeks) and moderate to late preterm (≥ 32 weeks). The preterm babies were evaluated for various morbidities sand mortality till they were discharged from the hospital. **Results:** Data of 100 babies was analyzed. Out of 100 preterm babies 40 were extremely to very preterm babies (<32 weeks) and 60 were moderate to late preterm babies (≥32 weeks). Significant risk factors associated with preterm deliveries were inadequate antenatal visits (73%), primi gravidity (58%), preterm premature rupture of membrane (55%), urinary tract infection (54%), anemia (53%), teenage pregnancy (43%), antepartum hemorrhage (41%) and pregnancy induced hypertension (33%). The total mortality was higher in extremely to late preterm than in moderate to late preterm. The most common causes of mortality were Neonatal sepsis (NNS), Hyaline Membrane Disease (HMD) and Birth Asphyxia. **Conclusion:** The hospital incidence of preterm neonates is still very high. The major risk factor seen in the study was inadequate antenatal visit. Preventive measures, early identification of risk factors will improve the outcome.

***Keywords*: Morbidity, Mortality, Preterm, Risk factor**

Author:

1. Dr. Niraj Acharya
2. Dr. Sumita Poudel

[1] Department of Pediatrics, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

[2] Department of Pediatrics, Chitwan Medical College, Bharatpur, Chitwan

Address for Correspondence:

Dr. Niraj Acharya
Assistant Professor
Department of Pediatrics
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: drnirajacharya@gmail.com

INTRODUCTION

Preterm birth is the leading cause of infant morbidity and mortality in the world. World Health Organization (WHO) defines preterm birth as any birth before 37 completed weeks of gestation or fewer than 259 days since the first day of woman's last menstrual period (LMP).[1] It is subcategorized on the basis of gestational age: extremely preterm (<28 weeks), very preterm (28 to <32 weeks), moderate to late preterm (32 to <37 weeks). It has been reported that over 60-80% of all neonatal mortality and morbidity is due to preterm birth.[2] Preterm birth complications account for 35% of the estimated 3.1 million global neonatal deaths and are the second leading cause of death in children under 5 years of age.[3]The etiology of preterm birth is multi-factorial and categorized as either spontaneous or indicated. Spontaneous preterm birth occurs secondary to either preterm labor or preterm premature rupture of membranes (PPROM). Indicated preterm births are those that occur because of medical or obstetric problem that places either the mother or the fetus at risk; delivery is undertaken to preserve or improve the maternal or fetalstatus.[4]

In developing countries, the main causes of preterm births include infectious diseases and poor availability and accessibility of health care resources. Families of low socioeconomic status have higher rates of maternal undernutrition, anemia and illness, inadequate prenatal care, drug misuse, obstetric complications and maternal history of reproductive inefficiency (abortions, still-births, premature or low birth weight infants).[5] Preterm babies are at increased risk of mortality and morbidity, mainly due to infections and complications of prematurity. A better understanding of antenatal factors contributing to

preterm birth and need for improvement of perinatal care are necessary to prevent preterm births and to increase neonatal survival. Hence this study was conducted.

METHODS

A hospital based prospective study was carried out to estimate the incidence, risk factors and outcome of preterm neonates from May 2017 to April 2018., admitted in NICU department of Pediatrics, Nepalgunj Medcial College and Teaching Hospital Kohalpur.

They were divided in two groups extremely preterm (<32 weeks) and moderate to late preterm (>32 weeks). The consent was obtained from the Parents. Those not willing to take part in the study were excluded. Ethical clearance from Institutional Review Committee, NGMC, Kohalpur was obtained. Data regarding the demographic parameters like maternal age, parity, literacy status, socioeconomic status, antenatal checkup, gestational age, mode of delivery were recorded in structural questionnaire.

Neonatal parameters like perinatal asphyxia, Apgar score, sex, gestational age, birth weight were recorded for maximum one week. All the data were analyzed by using SPSS version 20.

RESULTS

There were 3978 birth during the study period. Total alive preterm babies were 367 (9.22%). Among them 71 (19.34%) were extremely to very preterm and 296 (80.65%) were moderate to late preterm. (Figure 1)

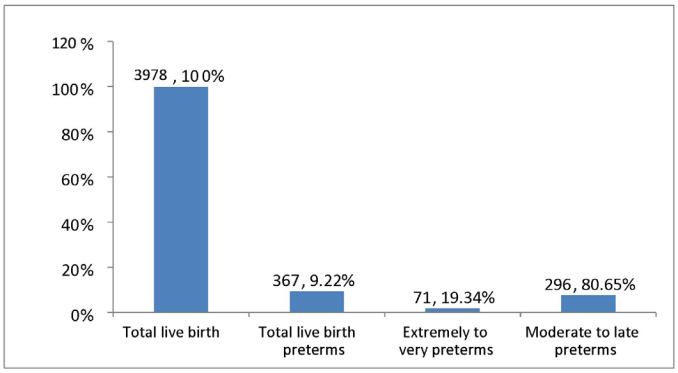

Figure 1 : Incidence of preterm birth at hospital

Out of 1410 NICU admission, 192(13.61%) preterm were admitted in NICU and 57 (29.68%) were extremely to very preterm and 135 (70.31%) were moderate to late preterm. The Parents of 92 preterm babies in NICU did not consent to take part in the study. Hence 100 preterm were taken out of which 40 were extremely to very preterm (<32 weeks) and60 were moderate to late preterm (>32 weeks).

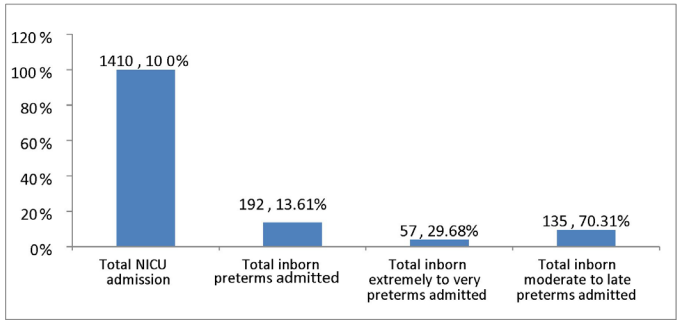

Figure 2: Preterm babies admitted in NICU

When the risk factors were analyzed it was found that the inadequate antenatal visits (73%) was the commonest cause of preterm births followed by prim gravidity (58%), PROM (55%). (Table I)

Risk factors	Number of patients	Percentage
Inadequate antenatal visits	73	73
Primigravidity	58	58
Preterm Premature Rupture of membrane (PPROM)	55	55
Urinary Tract Infection (UTI)	54	54
Anemia	53	53
Teenage pregnancy	43	43
Antepartum hemorrhage (APH)	41	41
Pregnancy Induced Hypertension (PIH)	33	33

Table I : Risk factors for preterm births in relation with maternal illnesses

In our study, maximum number of extremely to very preterm group (<32 weeks) belonged to very low birth weight (≥1000-1500 gm) comprising of 85% while maximum number of moderate to late preterm babies (≥32 weeks) belonged to low birth weight (>1500-2500 gm) comprising of 50%. These values also showed a statistically significant association between gestational age and birth weight ($p<0.05$). (Table II)

Birth weight (gms)	Gestational age				Total	p-value
	<32 weeks		≥32 weeks			
	Number	%	Number	%		
<1000	3	7.5	1	1.6	4	
≥1000-1500	34	85	29	48.4	63	< 0.01
>1500-2500	3	7.5	30	50	33	

Table II : Relation between gestational age and birth weight

Among extremely to very preterm babies, 31 (77.5%) out of 40 survived whereas 57 (95%) out of 60 of moderate to late preterm survived. The main causes of mortality were Neonatal Sepsis (NNS), Hyaline Membrane Disease (HMD) and Birth Asphyxia. (Table III)

Survival	Gestational age				Total	p - value
	<32 weeks		≥32 weeks			
	Number	%	Number	%		
Alive	31	77.5	57	95	88	
Deaths	9	22.5	3	5	12	< 0.01
Total	**40**	**100**	**60**	**100**	**100**	

Table III : Survival of preterm babies

Various immediate outcomes of preterm in extremely to very preterm (<32 weeks) and moderate to late preterm group (≥32 weeks) are shown in Table IV. Majority morbidities and majority of morbidities were observed in extremely to very preterm group (<32 weeks).

Outcomes	Gestational Age		Total (%)
	< 32 weeks (n=40)	≥ 32 weeks (n=60)	
Neonatal Sepsis (NNS)	36 (90%)	32 (53.3%)	68
Neonatal Jaundice (NNJ)	30 (75%)	29 (48.4%)	59
Hyaline Membrane Disease (HMD)	20 (50%)	9 (15%)	29
Birth Asphyxia	16 (40%)	15 (25%)	31
Apnea of Prematurity	6 (15%)	4 (6.6%)	10
Hypoglycemia	6 (15%)	5 (8.33%)	11
Anemia	6 (15%)	2 (3.33%)	8
Hypothermia	3 (7.5%)	1 (1.6%)	4
Necrotising Enterocolitis (NEC)	1 (2.5%)	1 (1.6%)	2

Table IV : Morbidities of Preterm Babies

DISCUSSION

In our study the hospital based incidence of preterm babies was 9.22% of total live birth with 19.34% extremely to very preterm (<32 weeks) and 80.65% moderate to late preterm (≥32-37 weeks).This is comparable to hospital incidence of preterm neonates in Tribhuwan University Teaching Hospital (TUTH) which was reported as 6.8% of total live births as shown by Shrestha et al[6]with 10.5% severe preterm, 28.5% moderate preterm and 61% late preterm.

In our study, 43% of mothers were teenagers. In a study by Shrestha et al [6] teenage pregnancy was reported in 34.7%. Similarly, in another study by Onyaye et al[7] 6.5% mothers were teenagers.

In our study 58% mothers were primi. In another study by Mohsenzadeh et al[8] 56.3% of mother giving birth to preterm were primigravida which is comparable with our figures. The higher percentage of primi mother leading to preterm birthin the present study could be due to higher percentage of teenager and thereby leading to preterm birth due to early age of marriage, and poor perinatal care.

Majority of the mothers (73%) in the present study had received inadequate antenatal care (ANC) visits (<4). While study by Shrestha et al[6] showed 52% of mother had inadequate antenatal visit.

Majority of the mothers in our study were found to have UTI (54%). This is comparable to a study by Halimi et al[9] where 43.5% of mothers had UTI.

A significant association (53%) was seen between maternal anemia and preterm babies. Similar observation was made by Halimi et al [10] who pointed that 48.3% of the mothers had anemia. A higher incidence of association of anemia in mothers giving preterm birth in our study may be because of the fact that majority of mothers belonged to teenage group and had inadequate ANC visits.

In the present study, 41% of mothers had a history of antepartum hemorrhage. In a similar study by Shrestha et al[6] APH wasseen in 23.3%.The higher number of mothers with APH could be due to majority of mothers belonging to teenage group and inadequate antenatal checkup.

Out of 100 mothers, 33 (33%) had a history of PIH. Our results are comparable to the results of Shrestha et al[11] where 26% of mother had history of PIH. Similar result was also seen in a study by Onyaye et al[7] where 23.9% mothers had PIH.

Majority of mothers in the present study had PPROM comprising 55%. This is comparable to a study by Onyaye et al [7] where 46.5% of mothers had PPROM. Similarly in a study by Halimi et al[9] 77.1% mothers of preterm had PPROM.

Regarding neonatal outcome, in the present study, 4% preterms were less than 1000 grams, 63% between 1000- 1500 grams and 33% more than 1500 grams. In similar study done by Shrestha et al[6] 6.7% of preterm babies were <1000 grams while 28.7% preterm babies were between 1000-1500 grams and 64.7% preterm babies had weight more than 1500 gram. In another study by Das et al[10] 19.4% of preterm had weight <1.5 kg while 71.5% had weight between 1.5-2.5 kg and 9.1% had >2.5 kg weight at the time of birth.

Out of 100 preterms in our study, 31 out of 40 (77.5%) of extremely to very preterm babies survived whereas 57 out of 60 (95%) of moderate to late preterm survived. And the total mortality was 12% with 22.5% of the extremely to late preterm and 5% of moderate to late preterm. In a similar study by Shrestha et al[11] overall mortality was found to be 12%. In another study done by Onyaye et al[7] the overall survival rate was 65.9%. The survival rate was significantly higher in the

mild preterm category, 83.8% compared to the very preterm, 47.8% and extremely preterm, 11.1%.

The most important complication in our study was NNS in 68% of preterm, followed by Neonatal Jaundice 59%, Birth Asphyxia 31%, HMD 29%, Apnea of Prematurity 10%, Hypoglycemia 11%, Anemia 8%, Hypothermia 4%, and Necrotizing Enterocolitis (NEC) 2%.In similar study by Shrestha et al.,[6] sepsis was found in 66.7% followed by NNJ in58.8%, Birth Asphyxia in 26.8%, HMD in 23.5%, NEC in 13.1%, Hypothermia in13.1%, Hypoglycemia in 9.8%, Hyponatremia in 6.5%,Intra ventricular hemorrhage (IVH) in 3.9%, Hypocalcemia in 3.9% and Apnea in 3.3%.

LIMITATION

This study only looked into the immediate outcome. Further study is needed to assess the long term (One year) outcome of these babies. The neurological outcomes are not assessed.

CONCLUSION

Significant maternal risk factors associated with preterm babies were inadequate antenatal visits, preterm premature rupture of membrane, teenage pregnancy, urinary tract infection, anemia, antepartum hemorrhage, pregnancy induced hypertension.

Common morbidities among preterm babies were Neonatal sepsis followed by Neonatal Jaundice, Birth Asphyxia, Hyaline Membrane Disease, Apnea of Prematurity, Hypoglycemia, Anemia, Hypothermia, and Necrotizing Enterocolitis. Overall mortality was 12%. The main causes of mortality were NNS, HMD and Birth Asphyxia.

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ORIGINAL ARTICLE

Efficacy of Tranexamic Acid in Reducing Blood Loss during and After Caesarean Section: A Case control Study

Sinha K[1], Pandey S[2], Khadka D[3]

ABSTRACT

Introduction: The incidence of caesarean section is increasing day by day. One of the most common complications is primary or secondary postpartum haemorrhage. Tranexamic acid has been shown to be very useful in reducing blood loss and incidence of blood transfusion in varieties of surgery. **Aim:** To study the efficacy of tranexamic acid in reducing blood loss during and after the lower segment caesarean section. **Methods**: Arandomized, case controlled, prospective study was conducted on 100 women undergoing lower segment caesarean section carried out in the Department of Obstetrics and Gynaecology, Nepalgunj Medical College, Kohalpur from Sept 2019 to Feb 2020**.**Fifty of them were given tranexamic acid immediately before lower segment caesarean section and were compared with 50 others to whom tranexamic acid was not given. Blood loss was collected and measured during two different time interval. The first period was considered from placental delivery to end of lower segment caesarean section and second from the end of lower segment caesarean section to 2 hours postpartum period. Vital signs at time of delivery, at 1 hour and 2 hour postpartum and APGAR score at 1 min and 5 min were studied in both the groups. **Result**: Tranexamic acid significantly reduced the quantity of blood loss from the placental delivery to 2 hours post-partum: 360.9 ml in the study group, versus 443 ml in the control group (p=0.0008).It also significantly reduced the quantity of blood loss from the end of lower segment caesarean section to 2 hours postpartum:71.5 ml in the study group versus 112.6 ml in the control group (p=0.0002).There was 18% less incidence of postpartum haemorrhage , who received tranexamic acid(p=0.02).There were no significant adverse drug reaction and difference in APGAR score in both the groups. No complications or side effects were reported in either group. **Conclusion**: Tranexamic acid is safe and effective in reducing blood loss among women undergoing lower segment caesarean section.

Keywords: Antifibrinolytic, Lower segment Caesarean section (LSCS), Postpartum haemorrhage (PPH), Tranexamic acid

Authors:

1. Dr. Kavita Sinha
2. Dr. Subhash Pandey
3. Dr. Dipendra Khadka

[1] Department of Obstetrics & Gynaecology, Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke

[2] Department of Emergency & General Practice, Bardiya Hospital, Bardiya

[3] Department of Medicine, Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke

Address for Correspondence:

Dr. Kavita Sinha
Department of Obstetrics & Gynaecology
Nepalgunj Medical College Teaching Hospital
Kohalpur, Banke, Nepal
Email: ksinhapandey@gmail.com

INTRODUCTION

The incidence of caesarean section is increasing day by day**.** The incidence of complications is much higher when compared with normal vaginal delivery. Out of these complications primary and secondary postpartum haemorrhage (PPH) is most common. It leads to increased maternal morbidity and mortality. Effect of this complication is reduced by reducing the amount of blood loss during and after caesarean section.[1] An evidence based approach is to minimize peri-operative bleeding through the prophylactic use of the antifibrinolytic agents Aprotinin, Tranexamic acid and Epsilon animocaproic acid.[2]

Blood loss frequently leads to transfusion of allogeneic blood products, which expose patients to the risk of transfusion – related adverse effects such as febrile, non-haemolytic transfusion reactions, transfusion errors and blood born infections. Concerns about blood safety, continual blood shortages and rising costs of blood bank have generated interest in the reduction of transfusion requirements during and after surgery. Tranexamic acid is a synthetic derivative of the amino acid lysine that exerts its antifibrinolytic effect through the reversible blockade of the lysine binding sites on plasminogen molecules.[3,4] It almost completely blocks the

interaction of plasminogen and heavy chain of plasmin with the lysine residues of fibrin monomer.[5] Intravenous administration of tranexamic acid has been routinely used for many years to reduce haemorrhage during and after surgical procedures.

After an intravenous dose of 1gm tranexamic acid, the plasma concentration time curves show riexponential decay with a half-life of about 2 hours for the terminal elimination phase. Urinary excretion is the main route of elimination via glomerular filtration. Overall, renal clearance is equal to plasma clearance (110 to 116 ml/min) and 90% excreted at 24hours after IV administration.[6] It passes though the placenta as well.[7] This study was conducted to demonstrate the efficacy of tranexamic acid on blood loss during and after LSCS.

METHODS

A randomized, case controlled, prospective study was conducted on 100 women undergoing lower segment caesarean section (LSCS) carried out in the Department of Obstetrics and Gynaecology, Nepalgunj Medical College, Kohalpur from Sept 2019 to Feb 2020**.** Ethical approval was taken from Institutional review committee (IRC), Nepalgunj Medical College and written informed consent was taken from each patient.

Full term primigravida or multigravida with singleton pregnancy delivered by LSCS with normal or abnormal presentation was included in this study. The following cases were excluded from the study: allergy to tranexamic acid, history of thromboembolic event, placenta praevia, placenta abruption, Pregnancy Induced Hypertension, multiple pregnancies, polyhydroamnios, macrosomia, any medical and surgical problems and any blood dyscrasia. Total cases enrolled were 100 which were allocated in 2 groups and tranexamic acid given on basis of lottery system, picked up by anaesthetic team, before starting the Surgery.

1. Study group (50) - subjects who received tranexamic acid
2. Control group (50) - subjects who did not received tranexamic acid

Preparation of tranexamic acid injections solutions, 1gm/10ml tranexamic acid diluted with 10ml of distilled water. 20 minutes before incision, 1gm of tranexamic acid intravenous slowly infuse over 5 minutes. After delivery of neonate oxytocin 10 units in a pint of DNS was given by IV over 30mins.

Clinical Observations of vital signs- Blood Pressure, Respiratory rate and heart rate were measured immediately after placental delivery and 1 and 2 hours after birth respectively. The extent of PPH-Blood was measured by weight and volume following placental delivery to completion of skin closure and from completion of skin closure to 2 hours after birth. Side effects after giving tranexamic acid were noted. Laboratory examinations- pre operation haemoglobin, packed cell volume, Bleeding Time, Clotting Time, urine analysis were sent.

Blood was collected by a suction container and soaked gauze pads. Blood was measured post-partum during two separate periods from placental delivery to 2 hours postpartum. Amniotic fluid and amount of blood loss before delivery was not included in this study.

Calculation of blood loss

The quantity of blood (ml) = (weight of material used after surgery- weight of material used prior to surgery) +(volume sucked in suction bottle after placental delivery).In addition, the pads used after completion of LSCS to 2 hour postpartum were separately weighed.

Data collected in structured proforma were entered in Microsoft Excel, compared by using chi-square test and statistical analysis was done with SPSS version 20.

RESULTS

Variables	Study group (mean± SD) N=50	Control group (mean ±SD) N = 50	z test	p-value
Age (years)	23.62±3.429	24.5±3.982	1.19	0.239
Height (cm)	152.56±5.75	153.2±6	0.54	0.588
Weight (kg)	52.54±7.86	53.5±7.45	0.63	0.532

Table I : Distribution based on patient characteristics in both groups

Mean age was 23.62 years in the study group and 24.5 years in the control group. The difference in age, height and weight of both the groups were not statistically significant.

Duration	Study group mean blood loss(ml)	Control group mean blood loss (ml)	z test	p-value
Time of placental delivery to completion of skin closure	289.4±71.4	328.4±58.9	2.98	0.004
From completion of skin closure to 2 hrs postpartum	71.5±53.6	112.6±51.7	3.9	0.0002
Time of placental delivery to 2 hrs postpartum	360.9±110.3	443±88.552	4.17	0.0008
Amount of blood loss > 500ml (PPH)	6 (12%)	15 (30%)	2.27	0.02

Table II : Comparison of blood loss from placental delivery to 2 hrs post-partum and Post-partum haemorrhage

Above table shows mean blood loss from placental delivery to 2 hours postpartum was statistically significant (p=0.0008) in both groups. Incidence of PPH was significantly less (p=0.02) those receiving tranexamic acid.

	Vital signs	Study	Control	z test	p-value
At the time of placental delivery	HR (bpm)	86.14±7.25	84.81±8.35	0.86	0.394
	RR (breath/min)	19.38±2.29	19.94±2.14	1.26	0.21
	SBP (mm of Hg)	121.08±10.1	119.81±9.47	0.65	0.514
	DBP (mm of Hg)	77.08±7.04	76.88±7.61	0.14	0.892
1 hour after surgery	HR (bpm)	86.14 ± 7.05	82.18 ± 8.92	2.46	0.066
	RR (breath/min)	19.6 ± 2.25	19.98 ± 2.49	0.8	0.426
	SBP (mm of Hg)	128.24 ± 11.5	124.44 ± 8.75	1.32	0.065
	DBP (mm of Hg)	80.48 ± 6.77	77.44 ± 5.41	1.36	0.08
2 hours after surgery	HR (bpm)	79.96 ± 7.55	82.16 ± 7.08	0.36	0.094
	RR (breath/min)	19.44 ± 2.57	19.58 ± 2.75	0.26	0.798
	SBP (mm of Hg)	127.16 ± 12	119.72 ± 11.5	0.465	0.647
	DBP (mm of Hg)	81.04 ± 6.12	78.28 ± 5.39	1.39	0.101

HR: Heart rate, RR: Respiratory rate, SBP: Systolic blood pressure, DBP: Diastolic blood pressure

Table III : Table showing vitals of both groups at different interval

There was no statistically significant difference in vital signs at placenta delivery, 1 hour after delivery and 2 hours after delivery.

APGAR score	Study	Control	z test	p-value
1 min	8.88+1.19	8.64+1.34	0.95	0.345
5 min	9.4+0.639	9.22+0.79	1.25	0.213

Table IV: Comparison of APGAR score in both the groups

Adverse drug reactions	Study	Control	z test	p- value
Nausea	16	13	0.66	0.508
Vomiting	09	08	0.08	1.135
Diarrhoea	01	00	1.01	0.312
Signs of thrombosis	00	00		

Table V : Comparison of adverse drug reaction in both the groups

No serious side effects noted in study group and difference in APGAR score in both the groups as shown in table IV and V.

DISCUSSION

Tranexamic acid exerts its antifibrinolytic effect by blocking the lysine binding locus of the plasminogen and plasmin molecules, thereby preventing the binding to the fibrin substrate. During placental delivery, fibrinogen and fibrin are rapidly degraded, whereas plasminogen activators and fibrin degradation products (FDP) increase due to activation of fibrinolytic system. This activation can last up to 6-10 hrs postpartum, causing more bleeding. It was because of this activation of fibrinolytic system that we decided to use tranexamic acid in this study. Our study showed that tranexamic acid significantly reduces bleeding from time of placental delivery to 2 hrs postpartum in LSCS which is comparable to the studies conducted by Ming-ying Gaiet al[8], Gohel M et al[9], Leila Sekhav at et al.[10] Tranexamic acid also reduced the incidence of postpartum haemorrhage (patients with blood loss ≥ 500 ml) by 18% in study group as compared to control group. Ming-yingGai[8], Zheng SR et al[11] showed similar results.

There was no significant alteration in the vital signs of subjects following tranexamic acid administration at time of delivery and at 1 hr & 2 hrs postpartum. Similar findings were reported by other studies too.[8, 10, 11, 12] In our study, there was no statistical difference in APGAR score at 1 & 5 minutes in both the groups, comparable observations were reported by Ming-yingGai et al[8]and Zheng SR et al.[11] The incidence of thrombosis during pregnancy & puerperium is 5-6 times higher than that in the general population. When the anti-fibrinolytic drug tranexamic acid is administered, the increased risk of thrombosis should be considered, especially in the LSCS postpartum population. In our study, not a single patient developed signs of thrombosis; similar results were found in Ming-ying Gai[8], Gohel Met al.[9] The side effects of tranexamic acid as nausea, vomiting& diarrhoea were not statistically significant in our study.

LIMITATIONS

The limitations of this study are smaller sample size and pitfall regarding measurement of actual amount of blood loss.

CONCLUSION

Tranexamic acid can be used safely in subjects with lower segment caesarean section. It significantly reduced the amount of blood loss during and after the operation and was not associated with any adverse side effects like nausea, vomiting, diarrhoea or thrombosis. Foetal outcome as evaluated by APGAR score was not adversely affected by use of tranexamic acid.

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ORIGINAL ARTICLE

Treatment Outcome of Métaizeau Technique of Intramedullary Pinning in Pediatric Displaced Radial Neck Fracture

Karki P[1], Ranabhat R[2], Shah A[1]

ABSTRACT

Introduction: Displaced radial neck fracture in children when poorly managed results in deformity of elbow and incapacitates patient's daily activities due to compromised forearm motion, hence they require careful attention. **Aim:** The aim of this study is to assess the outcome of Métaizeau Technique in displaced radial neck fracture in Children. **Methods:** This hospital based study evaluated the treatment outcome of 35 patients with an average age of 9.34 years (range, 6 – 14 years), who presented with displaced radial neck fracture; and were treated by Métaizeau technique of intramedullary pinning by Kirschners (K) wire at Nepalgunj Medical College, Kohalpur from April 2017 to January 2020. Only Judet's type 3 and 4 fractures were included in this study. Close reduction was attempted in all cases. All patients were followed up for an average of 8.4 months (range, 6-12 months). Functional outcome was assessed as per Métaizeau functional score. **Results:** All fractures united at an average of 3.77 0.84 months (meanSD). Twenty seven patients had type 3 fracture and remaining 8 had type 4a fracture. Twenty five (92.5%) patients with type 3 fracture exhibited excellent results; while three patients (37.5%) with type 4a fracture had excellent outcome. Closed reduction produced excellent outcome in all patients while 80.95% patients with percutaneous reduction had excellent result. **Conclusion:** Outcome depends on initial fracture type and mode of reduction. Closed reduction should be preferred over an open reduction in order to achieve superior outcome.

Keywords: **Intramedullary nailing, Métaizeau technique, Pediatric radial neck fracture, Percutaneous reduction.**

Authors:

1. Dr. Prateek Karki
2. Dr. Roshani Ranabhat
3. Dr. Aman Shah

[1]Department of Orthopedics, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke
[2]Department of Radiology, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

Address for Correspondence:

Dr. Prateek Karki
Department of Orthopedics
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: prateekkarki@gmail.com

INTRODUCTION

Radial neck fracture accounts for 5 to 10% of fractures around elbow in children.[1] The injury may happen with fall in an outstretched hand with elbow in extension and valgus or rarely associated with an elbow dislocation. [2, 3] In both the mechanism, the force which is transmitted through the proximal radial epiphysis concentrate over neck region hence causes a fracture there.[3]

Judet[4, 5] has classified radial neck fracture based on degree of angulation (table I). Those displaced less than 30 degrees can be managed with posterior splints for one to two weeks. [6] Those angulated more than 30 degrees or severely displaced fractures needs reduction. Open reduction however is discouraged in these injuries, as it may lead to complications like avascular necrosis (AVN) of radial epiphysis, premature closure of the epiphysis or an intra-articular calcification. However, it is reserved only for those fractures that remains significantly angled or displaced even after multiple attempts with closed reduction or minimally invasive techniques have failed. Therefore, for severely angulated fractures a post-reduction residual angulation less than 30 degrees has a benefit over risk in an attempt to achieve anatomical reduction by open reduction introducing further soft tissue trauma.[6]

This study aims towards functional and radiographic evaluation of Judet's type 3 and type 4 radial neck fractures managed with an intramedullary Kirschners (K) wire fixation by technique as described by Métaizeau [7], preferably by close reduction or with the help of a percutaneous K-wire leverage. Open reduction was reserved only for those fractures that cannot be reduced even after minimally invasive percutaneous leverage.

This surgery helps in anchorage of small proximal fragment with adequate stability without violating elbow joint, so that elbow movement can be started early. The surgery is simple and does not require a steep learning curve. Implant removal is also an outpatient procedure making the treatment cheap. This Study aims to assess the functional and radiological outcome in displaced radial neck fracture in Children.

Judet's Classification	Degree of angulation
Type 1	Undisplaced
Type 2	< 30 degrees
Type 3	30-60 degrees
Type 4a	60-80 degrees
Type 4b	>80 degrees

Table I : Judet's classification of pediatrics radial neck fracture[4, 5]

METHODS

This prospective observational study consists of 35 pediatric patients with displaced radial neck fracture who were taken as convenient sampling technique at Nepalgunj Medical College Teaching Hospital, Kohalpur, Nepal from April 2017 to January 2020 and were managed with an intramedullary K-wire by Métaizeau technique.

Informed written consent was taken from the patient's guardian and only those willing to take part in this study were included.

Inclusion criteria:

1. Age between 6 years to 14 years
2. Angulation more than 30 degree at fracture site.
3. Open growth plates of the elbow at the time of injury.

Exclusion criteria:

1. Open fracture.
2. Age more than 14 years and less than 6 years
3. Pathological fracture

Surgical technique

Under general anesthesia or brachial block patient was placed supine with injured limb over a hand table draped from axilla to hand. Approximately 2 cm longitudinal incision was made just about 2cm proximal to the distal radial physis under fluoroscopy, along lateral radial border. After meticulous dissection of soft tissues to avoid injury to superficial sensory branch of radial nerve, a hole was made by a bone awl over lateral cortex. A 2.0 mm K-wire with its sharp tip angulated almost 20 to 30 degrees; which was bent about 1.5 cm from its tip was introduced through the portal of entry. The wire was gently advanced till its tip reached the fracture site.

Close reduction was attempted in all cases with traction in extension of elbow and varus stress with surgeons thumb pressing over radial head as described by Patterson.[8] If the reduction was successful (radial neck– shaft angle was reduced to <30 degrees and displacement of bone fragments less than 30%), then the K-wire with bent tip was advanced into the proximal fragment and was rotated 180 degree after engaging into proximal epiphysis, as described by Métaizeau. [7] If close reduction was unsuccessful then the displaced radial head was manipulated with a 2mm K-wire percutaneously under fluoroscopy as described by Böhler. [9] After successful reduction, the intramedullary K- wire was inserted in previously described technique and the percutaneous K- wire was removed.

In some displaced fractures where the reduction could not be achieved even after minimally invasive technique, an open reduction was carried out with Kocher approach.[10] Approximately 5 mm of the lower end of intramedullary K wire was slightly bent and was left outside skin for removal after the fracture consolidates. Postoperatively an above elbow slab was applied for two weeks. After removal of plaster, elbow was gently mobilized.

Patients were followed up at regular intervals at two weeks, four weeks, eight weeks, 12 weeks post operatively and then every two months from six months to one year. At the final follow up, flexion and extension of elbow and pronation and supination of the forearm were measured by a goniometer while the contralateral elbow served as a control. Functional recovery of elbow was assessed according to Métaizeau functional score.[4, 7] Final radiographs of elbow in antero-posterior and lateral views were used to evaluate any residual angulation. [11] It was measured by an angle subtended by a line drawn perpendicular to the articular surface and long axis of radial shaft and results were documented as table II:

Radiological outcome	Residual angulation at fracture site
Excellent	If the reduction was anatomic
Good	If a simple shift or inclination not exceeding 20° persisted
Fair	If the tilt was between 20° and 40°
Poor	If the tilt was beyond 40

Table II : Radiological outcome after pediatric radial head fracture[11]

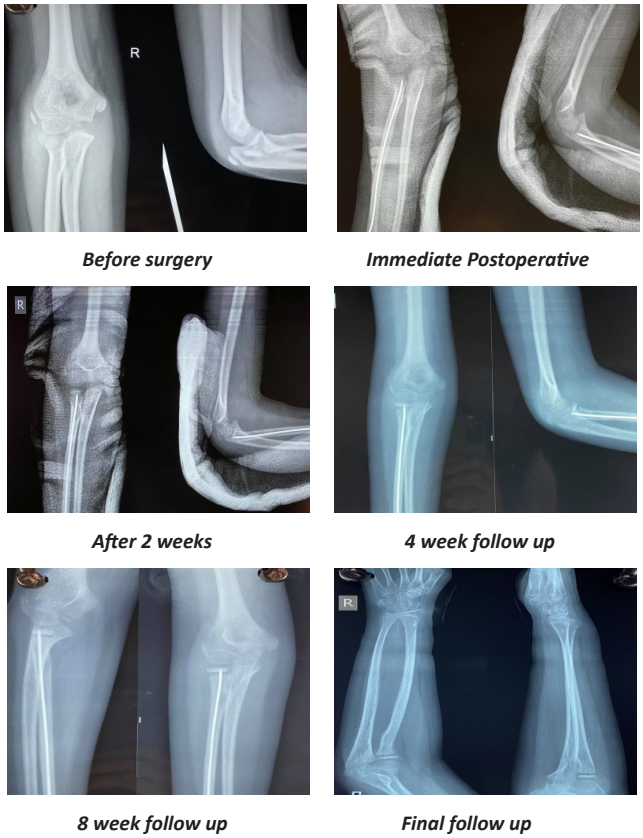
Statistical analysis

All statistical analysis was performed using SPSS version 25. P<0.05 was considered statistically significant. Pearson chi-square test was used to analyze functional outcome according to classification of fracture and type of reduction during surgery. Mean and standard deviation were calculated for all measured and calculated values.

RESULTS

We included 35 patients (21 male and 14 female) with an average age of 9.34 years (range, 6 – 14 years) meeting the inclusion criteria. The patients were followed for an average

of 8.4 months (range, 6-12 months). All fractures united at an average of 3.77 0.84 months (meanSD), following which the K-wire was removed at outpatient basis (figure 1 showing sequential follow up).



Before surgery *Immediate Postoperative*

After 2 weeks *4 week follow up*

8 week follow up *Final follow up*

Figure 1 : Sequential radiograph till final follow-up

27 patients sustained fall while playing and remaining 8 had fallen from a tree. There were 27 type 3 fractures among which close reduction was possible in 11 patients (40%) while the remaining 16 fractures (60%) were reduced by means of a percutaneous leverage. Eight patients had type 4a, among which percutaneous reduction was done in 5 (62%) patients while 3 (38%) patients underwent an open reduction (table III).

				Functional Outcome			
				Excellent	Good	Fair	Total
Judet's Classification	Type 3	Reduction Type	Close	11	0	0	11
			Precutaneous	14	2	0	16
	Type 4a	Reduction Type	Open	0	2	1	3
			Precutaneous	3	2	0	5

Table III: Functional outcome in relation with type of fracture and method of reduction used

The initial fracture pattern had statistically significant influence over the functional outcome. Less severe displacement was associated with a better functional outcome. Out of 27 patients with type 3 fracture, 25 (92.5%) had an excellent result; while among those with type 4a fracture, only 3 (37.5%) had excellent result, p value 0.002 (table III).

Similarly, the type of reduction also had significant impact with functional outcome. All patients who underwent a close reduction had excellent functional outcome while only 80.95% patients with percutaneous reduction showed similar result and none of the patients with an open reduction exhibited excellent result, p = 0.001. However, those patients who required an open reduction had some degree of limitations in their elbow and forearm range movements. Out three patients in open reduction group two had good functional result and one had fair result (table IV).

Close		Type of reduction			Total
		Percutaneous	Open		
Functional outcome	Excellent	11	17	0	28
	Good	0	4	2	6
	Fair	0	0	1	1
Total		11	21	3	35

Table IV : Relation between type of reduction and functional outcome

One patient had neuropraxia of radial nerve following an open reduction, that later recovered after three months. Treatment outcomes in associated fractures were satisfactory (table V).

Associated injuries	Treatment method	Functional outcome		
		Excellent	Good	Fair
Medial epicondyle fracture	Conservative	0	1	0
Olecranon fracture	Tension band wiring	0	2	0
Undisplaced ulna fracture	Close reduction and intramedullary fixation	1	0	0

Table V : Treatment outcome in associated fractures

The radiological outcome in final follow up was excellent in 20 (57.14%) and good in 15 (42.86%) patients (figure 2).

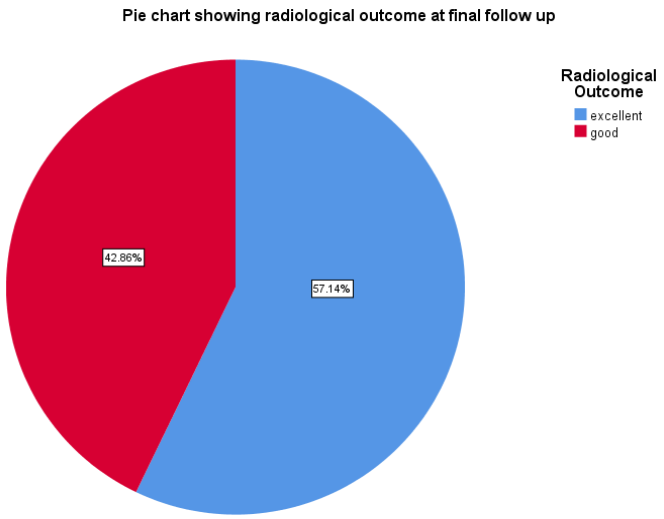


Figure 2 : Radiological outcome

DISCUSSION

Fracture usually occurs at radial neck region by indirect mechanism when the patient falls on an outstretched hand with elbow in extension and valgus.[3] The cartilaginous radial head in children are more resistant to fracture as compared to the radial neck.

The treatment options for radial neck fractures are widely determined by the radial neck–shaft angle. Un-displaced or minimally displaced fractures (Judet's type 1 and 2 respectively) can be successfully treated conservatively by an above elbow cast in neutral position or slight pronation for 2 to 3 weeks. [6, 12] Tachdjian's[6] and Métaizeau et al[7] have proposed angulation more than 30 degrees does not remodel and result in subsequent loss of forearm motion, hence the angulation should be corrected by surgery. In our study, we included only cases with angulation more than 30 degrees. These acceptable angulation limits are consistent with that of Zang et al[1], Ursei et al[11] and Wang et al.[13] An optimal treatment option for displaced fracture is still controversial. Several studies reported the functional outcome of close reduction and minimally invasive percutaneous leverage to be similar. [14, 15] In children cartilaginous radial head receives its blood supply from metaphysis, which may be impaired during fracture. This vascular insult may further attenuate during an open reduction leading to complications like avascular necrosis or premature fusion of physis. Hence an open reduction is widely criticized by several authors. [1, 7, 16, 17] Bernstein et al.[18] specifically reported poor functional outcome despite of a desirable perioperative reduction after an open reduction. Therefore we also reserved an open reduction in only those cases which remained angulated more than 30 degrees after closed reduction.

In our study closed reduction maneuver with varus stress as described by Patterson [8], was possible in 11 cases. Excellent result was obtained in all patients which was comparable to that of D'souza et al.[16] Of 21 cases where a K- wire was used percutaneously to lever and reduce the fracture, 17 patients had excellent outcome (81%) while remaining four patients exhibited good outcome. The result was encouraging and was consistent with that of Zang et al[1] and Ursei et al.[11]

Three patients, where fracture was severely angulated (Judet's type 4) underwent an open reduction. One patient had 30 degree loss of motion as compared to normal side and was considered as fair result as per Métaizeau functional score [4,7] while the remaining two had less than 20 degrees loss of motion exhibiting good result. All fracture united, which was not an issue however, those patients who underwent an open reduction landed with decreased elbow range of motion. The results were comparable with Zhang et al.[1] One patient with type 4a fracture where an open reduction was carried out, developed neuropathy of posterior interosseous nerve, which spontaneously recovered after 3 months. This patient had 20 degree loss of elbow motion arc and 10 degrees loss of supination of affected forearm which was documented as fair result as per Métaizeau functional score.[4, 7] Ugutmen et al[2] reported chance of damage to physis during K-wire manipulation however, in our study we could not find any difference in functional outcome between patients treated with close reduction or with the help of percutaneous leverage, result was not statistically significant $p > 0.005$. Our result were consistent with that of Al-Aubaidi et al[19] and Wang et al.[13]

LIMITATIONS

The sample size is smaller so that total numbers of patients were not enough to make more accurate conclusion but considering rarity of these fractures it is still a case series with adequate number. Another limitation is lack of control group to compare this technique with conservative management or plating to make a more meaningful conclusion.

CONCLUSION

We conclude that close reduction and percutaneous reduction are superior to an open reduction. Hence an open reduction can be avoided to pursue endeavour of achieving an anatomical reduction. The surgery is easy, cheap and implant removal can be done at an outpatient basis.

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Assessment of the Status of Contralateral Ear in Post-Operative Subjects of Unilateral Chronic Otorrhoea

Bhandari S[1], Shrestha S[1], Paudel DR[1]

ABSTRACT

I**ntroduction**: Chronic otitis media is one of the most common ear diseases in developing countries like Nepal and is important cause of the hearing loss. Chronic otitis media is rarely an isolated entity, because the responsible factors for its development in one ear in similar way will impact the contralateral ear, since both ears have a common "nasopharyngeal" drainage. Contralateral ear is defined as asymptomatic ear in cases of unilateral chronic otitis media. **Aim:** To evaluate the audiological profile of Contralateral ear in post-operative subjects of unilateral otorrhoea. **Methods:** Patients fulfilling criteria underwent Otoscopic examination, tuning fork test and pure tone audiometry. The findings of contralateral ear like retraction, tympanosclerotic patch (TS patch), thin, dull and atrophied tympanic membrane were noted. The final diagnosis with the type of surgery of diseased ear, as well as status of contralateral ear were entered into the proforma. All the patients were followed till three months in relation to anatomy of Tympanic membrane onotomicroscopy and pure tone audiometry respectively. **Results:** In postoperative cases of mucosal disease, the cases with abnormality in the contralateral ear reduced from 17 to 10 patients (30.3%) and the normal patients increased from 16 to 23 cases (69.7%). Likewise, in postoperative squamous disease, the cases with abnormality in the contralateral ear reduced from 14 to 11 patients (64.7%) and the normal patients increased from 3 to 6 cases (35.3%). Out of 50 cases, 14 cases (28%) had defective hearing while 36 cases (72%) had normal hearing in the contralateral ear respectively. **Conclusions:** The high incidence of occurrence of abnormality in contralateral ear indicate that both ears should be regarded as a pair. Unilateral Chronic otitis media should not be taken as a static phenomenon but as a continuous process in the other ear too.

***Keywords*: Chronic otitis media, Contralateral ear, Tympanic membrane**

1. Dr. Shama Bhandari
2. Dr. Sulav Shrestha
3. Prof. Dhundi Raj Paudel

[1] Department of Otorhinolaryngology, Nepalgunj Medical College and Teaching Hospital, Kohalpur

Address for Correspondence:

Dr. Shama Bhandari
Department of Otorhinolaryngology
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
E-mail: dr.shama.bhandari@gmail.com

INTRODUCTION

Otorrhoea, exiting of any discharge from the ear is the foremost symptoms of ear disease The discharge may be from external, middle ear and the skull base as well but chronic middle ear cleft infection and inflammation are the most common cause for chronic otorrhoea requiring various modalities of surgical management Chronic otitis media(COM) is defined as chronic inflammation of the middle ear (ME) and/or mastoid associated with permanent perforation or retraction of the tympanic membrane (TM) with or without otorrhoea.[1]

There are two types of COM - one could be associated with transient or permanent otorrhoea with central perforation of tympanic membrane and the other with or without discharge with marginal perforations, retraction with the potentiality of or frank cholesteaoma. The former is classified as mucosal and the later as squamous type. [2] COM, most likely is the result of earlier acute otitis media (AOM), negative ME pressure or otitis media with effusion (OME). Hearing loss associated with it is due to perforation of the ear drum and/or disruption of the ossicles.[3]COM is mostly associated with malfunction of Eustachian tube (ET). It is probable that a patient with unilateral discharge attributed to COM, may also have a disorder in the contralateral ear (CLE).[4] CLE is defined as the asymptomatic ear or in cases with bilateral symptoms, the ear with clearly less symptoms based on hearing loss, otorrhoea and overall discomfort.[2] It has become universal knowledge that COM is rarely an isolated disease. The factors responsible for initiating COM in one ear may as well affect the CLE since both ear share a common portal of aeration and drainage i.e. the nasopharynx. According to the continuum theory, unresolved OME later evolves into COM. Assessment of the clinico-pathological feature may reveal that states of CLE may indicate the etiology and evolution of disease of the worst

ear. The affected ear may well be the suggestive of impending pathological end point of the CLE.[5-8]The study of the CLE may provide clues to the pathophysiology of the primary disease of ear with full-blown disease, status of tubal function and contribute to the therapeutic planning.[9]

Though patients may attend ENT department with complains of ipsilateral ear discharge and without any complains of the contralateral ear its mandatory to examine both ear to rule out pathology in the asymptomatic ear. Sometimes non discharging ear may have more severe diseases.

METHODS

This study is Hospital based prospective, observational study done at Nepalgunj Medical College and Teaching hospital, Kohalpur from1st August, 2017 to 31st July, 2018. Sample size was 50 using the formula for sample size.

Including criteria: unilateral otorrhoea for more than 10 years undergoing surgical operation with contralateral non discharging ear were included cases.

Excluding criteria: Patient with bilateral otorrhoea with perforation, previous history of surgery in CLE, CLE dead or not suitable for hearing aid and having acute active upper respiratory tract infection were excluded.

All patients were fully informed about the procedure and informed consent was taken. Detailed history along with nasal obstruction, discharge, allergy and sore throat were also emphasized. A proforma was designed and tested.

Examination of ear, nose and throat, Otoscopic examination, Tuning fork test, Audiometric examinations were done. CLE was examined for any abnormalities or pathologies of both parts of TM in terms of thinness, dullness and atrophy tympanosclerotic patch (TS patch), and pathologies like Perforation, retraction cholesteatoma and other rare pathologies too.

The degree of HL for AC thresholds and BC threshold were measured and calculated by taking average threshold of speech frequencies i.e. mean of hearing threshold at 0.5, 1, 2, 4 Kilohertz (KHz). Masked PTA was done if there was a difference of more than 40 dB between AC threshold of the test ear and the BC threshold of the opposite ear or when the A-B gap of the poorer ear under test was more than 10 dB. The final diagnosis with the type of surgery of diseased ear, as well as CLE were entered into the proforma. All the patients were followed up at three months in relation to anatomy of TM (otomicroscopy) and pure tone audiometry (PTA)

The data collected was entered into SPSS software version 20 and further analysis was performed. The data was tabulated and the result of study were analyzed using statistical package for social science (SPSS) 20.0 and Microsoft word and Microsoft excel were used to generate graphs, tables etc. Before starting the study, ethical approval was taken from institutional review committee (IRC) of NGMC. Every participant's willingness was considered before including them in the study.

RESULTS

The most common age group affected by the disease was 10-20 and 21-30 years and the least commonly affected age group was 40–50 years. There were 29 (58%) female and 21(42%) male patient. Out of 50 cases of COM, 33(66%) patients had mucosal diseases and 17 (34%) had squamous disease suggesting a higher preponderance of mucosal disease.

Size and site of perforation (%)				Retraction		
Small pars tensa (0-40%)	Medium pars tensa (40-60%)	Subtotal	Attic perforation	PSRP	PT retraction	Sclerosis
16 (32%)	12 (24%)	4 (8%)	3 (6%)	8 (16%)	4 (8%)	3 (6%)

Table I : Pre-operative Otoscopic abnormality of TM of ipsilateral ear

Preoperative otoscope of ipsilateral ear showed 16(32%) small pars tensa, 12(24%) medium pars tensa, 3 (6%) attic perforation. (Table I)

Preoperative assessment of CLE ear revealed pathology exclusively in PT. Before undertaking operation, the assessment of the status of CLE in the mucosal COM cases revealed that 17(51.6%) patients had various pathological findings in the CLE while other 16 (48.4%) cases were observed to have normal otological and audiological status. Preoperative assessment in squamous COM cases (17) showed that 14 (82.3%) had pathological features on CLE's as well, and only 3 (17.7 %) of them were having normal otological and audiological status.

Out of 50 cases, the total number of patients with abnormalities of TM in the CLE were 31 (62%). In patients with mucosal COM, retracted PT was seen in 6 (21.2%), tympnosclerotic patch in 4 (12.1%), opaque TM was observed in 2 (6%), thinned out TM was noted in 3 (9%) cases. In addition, both retracted TM and TS patch was seen in 1 (3%) while none of the patients having mucosal type of COM had retracted PF. Retraction and sclerosis of PT were seen twice more often in mucosal type of disease. Furthermore, asymptomatic PF retraction was noticed in 4 (17.6%) of squamous type of COM in CLE. Sclerosis of TM was seen in equal number of cases in both type of COM, yet being numerically lesser in number than mucosal type. The thicker and opaque PT was 2 (6.1%) in mucosal type and 3 (17.6%) in squamous type which is an important feature of squamous type. Tympanic membrane retraction associated with TS patch 4 (23.5%)was a dominant feature of squamous type of COM. Thinning of TM, perhaps a sign of spontaneous healed perforation was observed exclusively in mucosal type of disease. (**Table II)**

Type of COM	Retracted PT	Retracted PF	T.S patch	Opaque TM	Thin TM	Retracted TM with T.S patch	Total
Mucosal	21.2%	0%	12.1%	6.1%	9.1%	3%	51.5%
Squamous	11.8%	17.6%	11.8%	17.6%	0	23.5%	82.3%

Table II : Pre-operative Otoscopic abnormalities in TM of CLE

This study shows that retracted PT was the most common otoscopic finding in TM of the CLE in case of mucosal disease while retracted PF was the least common finding. Similarly, in case of squamosal disease the most common otoscopic finding in the TM were the patients who presented with retracted TM with T.S patch while the least common findings in the TM was thin TM.

Type of COM	Pre-op			Post-op		
	Abnormal	Normal	Total	Abnormal	Normal	Total
Mucosal	51.6%	48.4%	100%	30.30%	69.70%	100%
Squamous	82.30%	17.70%	100%	64.70%	35.30%	100%

Table III : Post-operative otoscopic abnormalities of CLE

Out of 50 cases, the total number of patients with abnormalities of TM (on post-op otoscopic examination) in the CLE were 21 (42%). In the post-operative assessment out of 33 mucosal disease, 17 cases who had initial abnormality in the CLE had regression of pathologies in 7 cases but 10 patients (30.3%) continued to have it. There was apparent decrease in aural pathology in 7 cases, making pathologically free CLE's in total 23 cases of mucosal disease (69.7%).

Of those17 subjects who had squamous type COM, there were 14 (82.3%) cases having shown some pathology in the CLE's. Among these, the cases with abnormality in CLE reduced from 14 to 11(64.7%) with increasing normal appearing tympanic membrane from 3 to 6 (35.3%). (**Table III)**

Type of COM	Retracted PT	Retracted PF	T.S patch	Opaque TM	Thin TM	Retracted TM+T.S patch
Mucosal	6.1%	0%	12.1%	3%	6.1%	3%
Squamous	5.8%	11.8%	11.8%	11.8%	0%	23.5%

Table IV: Post -op otoscopic abnormality of CLE Tympanic membrane

Mucosal type of COM on follow up: Out of 33 cases, 5 cases with size of perforation up to 30%, morphology and hearing were normal on contralateral side and remained so in all but one who initially having had grade II retraction became normal on follow up. Of another 19 cases, 12 cases on contra-lateral side were normal and remained so, 4 cases had tympanosclerosis and 2 atrophic TM that showed no change on follow up. However, one case from each of these above group showed change during follow up, and that was the opaque and thick TM normalizing in morphology in one and in other grade II retraction becoming grade I. The remaining 9 cases having more than 50% loss of TM showed that grade I retraction of PT became normal on follow up in 3 cases, but one case grade I retraction, another with atrophic PT and yet another with normal drumhead remained unchanged. Furthermore, one case each of grade II retraction and other one with thin TM became normal whereas a case with grade II retraction improved to grade I. Therefore, in 33 cases of mucosal type COM the CLE had pathology in 17 on initial examination that normalized during follow-up in 7 cases but in 10 cases retained the pathology.

Squamous type of COM on follow up Out of 17cases of COM squamous type 9cases did not change morphology of TM in CLE on follow up. Of 17 cases, 3 cases 2 ears each with atrophic membrane and TS patches, one case each of dimpled PF and thickened membrane retained remained initial morphology. Other 5 cases with initial PT retraction bettered their grade of retraction. Furthermore, one case each of PT retraction, atrophic membrane and attic dimple became normal. Overall, 14 cases had abnormal morphology on initial examination of which 11 ears retained that pathology and 3 ears revealed betterment in the status of their pathology on follow up. (Table IV)

Among the 50 patients assessed, the patients with mucosal disease with mild hearing loss was 7 (21%), none of them had moderate hearing loss while 26 of them (78%) presented with normal hearing. Similarly, the patients with squamosal disease with mild hearing loss was 5 (29%), moderate hearing loss was 2(11%) and 10 patients (58%) presented with normal hearing. Out of 50 cases that was assessed, 14 cases (28%) had defective hearing while 36 cases (72%) had normal hearing in the CLE respectively. (Figure 1)

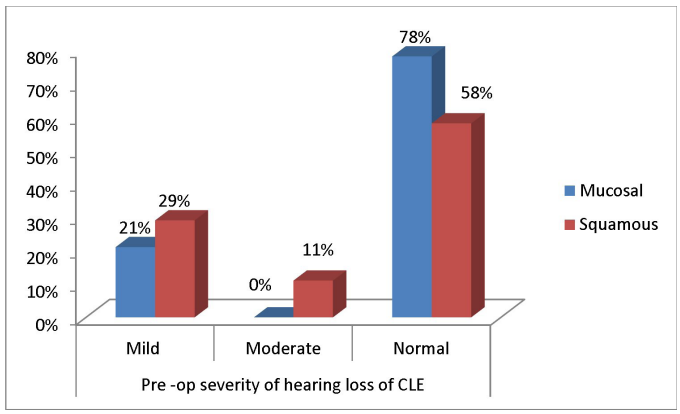

Figure 1: Pre-op Severity of hearing loss

Type of COM	Mild	Moderate	Normal
Mucosal	9%	0%	90%
Squamous	29%	0%	70%

Table V: Post -op severity of hearing loss of CLE

Among the 50 patients assessed, the patients with mucosal disease with mild hearing loss reduced from 7 to3 (from 21% to 9%), none of them had moderate hearing loss while the number of patient with normal hearing increased from 26 to

30 (from 52% to 90%). Similarly, the number of patients with squamosal disease with mild hearing loss remained the same i.e. 29%, none of them had moderate hearing loss and the patient with normal hearing increased from 10 to 12 (58% to 70%). Out of total 14 cases of defective hearing in contralateral ears 6 cases had improved hearing and in 8 cases hearing did not improve. (Table V)

DISCUSSION

Dawood MR (2018) reported the incidence of otoscopic structural abnormalities of CLEs to be mainly TM retraction in case of squamous type and thinning TM in mucosal type of COM.[11] Furthermore it is interesting to note from this study that in Mucosal type of otitis media the remnants of PT of TM were either atrophic or retracted with sclerosis and chalk patches. Where as in cases of squamous type COM the PT was very often thickened dull and opaque and also had sclerosis and chalk patches. It may or may not perhaps be due to actually OME only. This observation is in agreement with Chauhan B, Chauhan K (2013) who ascertained that the functioning of ET has a direct impact on normal ME function.[12] Out of 33 cases of COM mucosal, 14 had undergone tympanoplasty. For out of 17 case of squamous COM, 16 had undergone MRM and radical mastoidectomy in single case. In the post-operative assessment of the CLE, of those subjects who had mucosal type COM had regression of pathologies in 7 cases but 10 patients continued to have it. Similarly of those subjects who had squamous type COM with mild hearing loss remained the same i.e. 10%, none of them had moderate hearing loss and the patient with normal hearing increased from 10 to 12 (20% to 24%).In a study done by ShireenAzizkutty, Mubeena*.,* Mohammed N. A. most of the Tympanic membranes were abnormal, with contralateral ear of squamous disease showing more abnormality. Retraction and thinning were the most common abnormalities and 14.3% cases of pars tensa retractions in squamous cases were grade 4.[13] In our study 62 % had some sort of pathologies in CLE TM. Nine percentage of TMs were thinned out. Deguine found that the tympanic membrane in the contralateral ears of unilateral cholesteatoma patients was normal in only one third of cases.[14] In our study cholesteatoma was not seen in any cases.

LIMITATION

The Small sample size and study design are the major limitation of this study. It could have been analytical and comparative but again due to small size sample statistical significance could not be shown.

CONCLUSION

The present study has highlighted the possibility of existence of latent pathological process in CLE. We could also show significant regression in pathology of TM and improvement in air conduction; bone conduction in the CLE after treatment of diseased ear. His knowledge can be effectively used in therapeutic planning of diseased ear counselling of patient regarding other ear and if necessary providing therapeutic intervention in other ear at the earliest. The high incidences of occurrence of abnormality in CLE indicate that both ears should be regarded as a pair. The unilateral COM should not be taken as a static phenomenon but as a continuous process in other ear too. We could also show a significant improvement in the CLE after treatment of diseased ear, this knowledge can be effectively used in therapeutic planning of diseased ear, counseling of patient regarding other ear and if necessary providing therapeutic intervention in the other ear at the earliest.

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ORIGINAL ARTICLE

Normal Pituitary Gland Size and Morphology and Its Variations Related To Age and Gender: An MRI Evaluation

Jha A[1], Paudel N[1], Nepal S[1], Nayak R[1]

ABSTRACT

Introduction: The pituitary gland is regarded as the master endocrine gland of the body. Subtle alterations in the size can cause significant changes to other endocrine glands and hormonal status. Magnetic Resonance Imaging (MRI) is the investigation of choice to examine pituitary gland. It is important to know the range of normal size and variations according to age and gender to enable radiologists to suggest what might be an abnormal pituitary gland. **Aim**: This study aims to examine normal size, volume and shape of pituitary gland and to establish a normal reference value for pituitary size in different age groups and genders. **Methods:** MRI Brain of 137 patients were studied retrospectively and patients with endocrinal abnormalities were excluded from the study. Images were acquired in General Electronics 1.5 Tesla MRI machine and mid-sagittal T1WI and coronal T2WI were selected for accurate measurement of the gland. Height, AP diameter, Transverse diameter, and volume were calculated for each individual and the collected data was categorized based on age and sex for analysis. Pearson's correlation test was done to establish a relation between age and volume of the gland and a p-value of <0.05 was considered as significant. **Results:** Our study included 137 patients (57 males, 80 females) with age ranging from 3 to 86 years. The study was divided into six age groups. Mean pituitary height, AP diameter, transverse diameter and volume of the gland were 6mm, 8.9mm, 12.3 mm, and 354.5 mm^3 respectively. The gland observed a gradual increase in size up to the third decade and was more pronounced in the female population. A steady decline in the size of the gland was noted after 30 years for both populations. **Conclusion:** Good understanding of the normal size and shape of pituitary gland and its variation with age and gender is a must for every radiologist to compare with an abnormal increase in size.

K*eywords*: MRI, Normal, Pituitary gland

Authors:

1. Dr. Amit Jha
2. Dr. Nabin Paudel
3. Dr. Sabin Nepal
4. Dr. Rajesh Nayak

[1]Department of Radiodiagnosis, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

Address for Correspondence:

Dr. Amit Jha
Department of Radiodiagnosis
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: amitjha52.aj@gmail.com

INTRODUCTION

Pituitary gland is a small gland located in pituitary fossa of sphenoid bone. This region has significant variations between normal individuals, including sphenoid sinus, size of sella including depth and size and shape of pituitary gland. [1,2] It has been coined 'master gland' as it controls the activity of most other hormone-secreting glands. Before the advent of MRI, imaging of pituitary and hypothalamus region was done by plain radiographs and CT scan. Now MRI has been accepted as the investigation of choice to evaluate pituitary gland as there is a better delineation of the gland due to its resolution and as there is no harmful ionizing radiation involved. Depending on the hormonal status, the size of the gland changes. Usually, large size of the gland is observed in pregnant/ lactating women and small size in child and older individuals. The size and shape of this gland varies with age, sex, and even race of the individual. Thus, a detailed assessment of pituitary gland is very important as findings sometimes can be very subtle. Generally, it is possible to differentiate normal from abnormal size, there exists an ambiguous region where it is difficult for a radiologist to say whether the size is normal or not. For this assessment, one should be aware of its normal size, anatomy, and physiological variations with age and gender of the individual. Various studies are done to evaluate dimensions and physiological variations of pituitary gland [3, 4], however, there is paucity of such data on the dimensions of normal pituitary

gland in Nepali population. To the best of our knowledge only one similar study was carried out by Lamichhane et al, i.e., 'Age and gender related variations of pituitary gland size of healthy Nepalese people using magnetic resonance imaging'.[5] This study showed the mean height, AP diameter, transverse diameter, and volume of normal pituitary gland, however shape of the gland and subjects below the age of 10 years were not included in this study. Furthermore, the dimensions were measured in 0.3T MRI of 6mm slice thickness where only axial sections were used, whereas for most accurate measurements T1 weighted thin sections in sagittal and coronal planes should be used. Therefore, this present study was conducted for accurate assessment of pituitary gland dimensions in various age groups of both genders and to procure normal standard reference values for various dimensions of pituitary gland in Nepali population.

METHODS

This is a retrospective observational study carried out in Nepalgunj Medical College, Kohalpur, Nepalgunj, Nepal. Patients without any significant brain pathology or endocrine disorder who had undergone MRI Brain in the department of Radiology, Kohalpur, between November 2019 to May 2020 were chosen for this study. The study group consisted of 137 patients (57 males, 80 females). Institution review committee clearance was obtained.

Patient selection:

All patients of any age group and gender sent for MRI Brain were selected for this study with the following exclusion criteria.

Exclusion criteria

- Subjects with pituitary diseases in past or present.
- Subjects who received in past or receiving at present, hormonal therapy, including thyroxin, gonadal steroids, and adrenal steroids (except use of corticosteroid for <7 days before current MRI, and not prescribed for adrenal insufficiency)
- Subjects with history of any psychiatric disorder or receiving antipsychotic drug
- Subjects with history of intracranial surgery
- Subjects who were pregnant or in within 2 weeks of post-partum
- Subjects with structural abnormality of pituitary gland such as empty sella, cyst, microadenoma, etc.

The patients included in this study were divided into six age groups (1 to 10 years, 11 to 20 years, 21 to 30 years, 31 to 40 years, 41 to 50 years, 51 years and above) for both genders.

MRI sequences were performed using General Electronics MRI 1.5 Tesla scanner. Sequence parameters included matrix 352x256, FOV 230mm and 5mm slice thickness. The coronal and sagittal views were taken using the midline plane of both T1-weighted sagittal spin-echo and T2- weighted coronal spin-echo images. The mid-sagittal section was defined by visualization of the anterior and posterior pituitary gland with pituitary stalk in the same slice.

All the measurements were done in T1 weighted mid sagittal and T2 weighted coronal images (Figure 1 and 2). Vertical height (craniocaudal), anteroposterior (AP) diameter, transverse (TR) diameter was measured and volume was calculated using the formula V= AP dimension x TR dimension x CC dimension x 0.52. This formula was derived from the sphere volume equation coefficient and cubic volume calculation: $(4/3\pi)$ (r3)/ (2r) 3 =3.1416/6=0.52. Height, AP and TR diameter were expressed in mm and volume in mm^3. The shape of superior surface of the gland was observed to be concave, flat and convex.

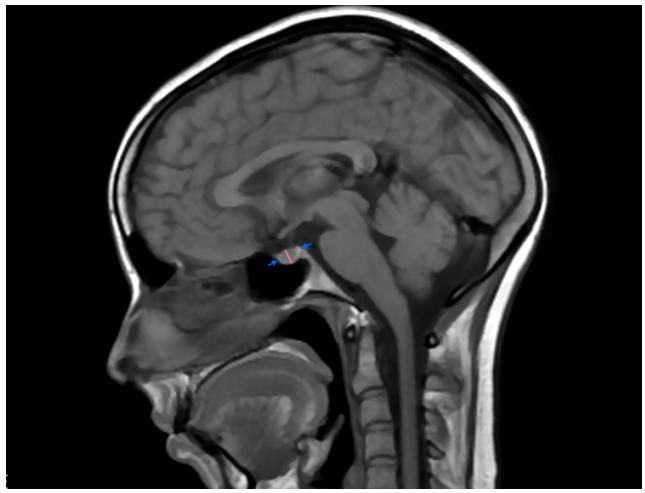

Figure 1 : Mid-sagittal T1WI at the level of stalk shows normal pituitary gland. The arrows represent the length (AP) and the central line represents the normal height (CC) of the gland

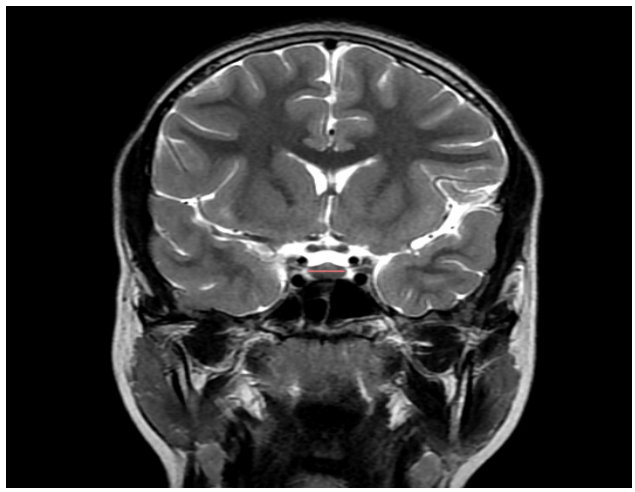

Figure 2 : Coronal T2WI image shows a central line which represents normal width (TR) of the gland. Also noted is superior convex surface of the gland

Statistical analysis

Statistical calculations were done using statistical package for the social sciences (SPSS). Mean and Standard deviations of pituitary gland height, AP and TR diameter were calculated in mm. Volume in different age groups was calculated in the scale of mm^3. The relationship between pituitary gland volume with age was examined statistically using Pearson's correlation while gender differences were evaluated using the Student's *t*-test. P-value of <0.05 was considered significant.

RESULTS

Pituitary gland dimensions of 137 patients within the inclusion criteria were measured out of which 57 were male (42%) and 80 females (58%). The age of the patients ranged from 3 years to 86 years. The mean pituitary gland height in our study group was 6 ± 1.3mm and the mean volume was 354.59± 128.25 mm^3. Mean height and volume for male were 5.53±1.06mm and 314.54±106.8 mm^3 and for female were 6.33±1.38mm and 382.95±135.13 mm^3 respectively. Mean height, AP diameter, transverse diameter, and volume of the gland according to different age groups are listed in table I.

Age group	Mean height in mm (SD)	Mean AP diameter in mm (SD)	Mean transverse diameter in mm (SD)	Mean volume in mm^3
1-10	3.6±0.6	6.8±0.9	9.9±1.2	126.1±28.1
11-20	6.4±0.9	8.5±1.2	12.3±1.4	357.3±96.2
21-30	6.7±1.2	9.3±0.9	13.±1.6	432.9±135.3
31-40	6.1±0.9	9.4±0.9	12.3±1.3	372.4±90.0
41-50	5.5±1	9.3±1.3	12.2±1.3	332.6±107.4
Above 50 years	4.9±0.9	8.4±1.3	11.9±1.8	259.6±77.6

Table I : Mean value of pituitary gland height and volume in different age groups

The mean value of pituitary gland dimensions and volume in different age group and both the sexes are given in the Table II and the relationship between age and pituitary gland volume in both sexes are demonstrated in Figure 3.

Age	Sex	Mean height in mm (SD)	Mean AP diameter in mm (SD)	Mean transverse diameter in mm (SD)	Mean volume in mm^3
1-10 years	Male	3.3±0.6	6.3±0.5	9.7±1.7	105.5±14.4
	Female	3.9±0.7	7.4±1	10.2±10.7	153.4±9.3
11-20 years	Male	5.9±0.9	8.8±1.3	12.5±1.5	350.2±107.6
	Female	6.6±0.9	8.4±1.2	12.2±1.4	361.2±92
21-30 years	Male	5.9±0.6	9.3±0.7	12.7±1.3	364±53.3
	Female	7.1±1.3	9.4±1.1	13.2±1.7	467.4±150.9
31-40 years	Male	5.8±0.8	9.1±1.3	12±1.18	334.8±89
	Female	6.3±0.9	9.6±0.5	12.5±1.4	398.2±83.8
41-50 years	Male	5.3±1.2	9.2±1.7	11.9±1.7	312.3±128
	Female	5.7±0.9	9.3±0.7	12.5±0.8	355.7±81.3
Above 50 years	Male	5.3±0.8	8.7±1.5	11.5±2.2	273.8±76.2
	Female	4.4±0.9	8.2±0.9	12.5±1	241.9±80.5

Table II. Mean value of pituitary gland height and volume in different age group and in both sexes

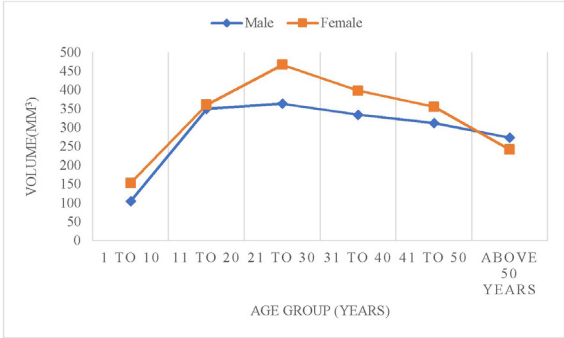

Figure 3 : Relationship between age and pituitary gland volume

Superior surface of the gland was categorized as concave surface, flat surface and convex surface. Superior flat surface was observed in 50 patients whereas the surface was concave in 44 and convex in 40 patients. Concave surface was mostly observed in patients <10 years of age and >50 years of age, while young adults showed mostly flat and convex surface. Pituitary volume was largest in age group 21 to 30 for both males and females. The lowest values recorded were in age group <10 years followed by above 50 years of age. Pituitary height and volume correlated negatively for age (p=0.161).

DISCUSSION

MRI is the preferred examination to visualize pituitary gland and the radiologist must be aware of the normal size and volume of the gland and the variations related to age and gender as small changes in the size of the gland could have a considerable effect on other neuro-endocrine glands. Borderline pituitary abnormalities are frequently encountered such as small microadenoma, physiological alterations of the gland and inflammatory diseases but there is a constant dilemma for the radiologists to report such cases. Although there are many works of literatures on normal size and variations of the gland abroad, there is a scarcity of such literatures in Nepal. This study was designed to recognize the normal size and volume of pituitary gland and its variations with age and sex in Nepali population.

Our study showed there was a linear increase in pituitary dimensions and volume up to 30 years of age in both sexes, after which a gradual decrease in size and volume was observed. This finding is consistent with a study conducted by Ibinaiye et al.[6]

Our study showed the mean height and volume of the gland to be 6 ±1.3mm and 354.59± 128.25 mm^3 respectively which

is partly comparable to the study performed by Lamichhane et al.[5] In contrast to their study, the mean volume of the gland in our study was much less as patients less than 10 years of age were not included in their study and our study shows the mean volume of the gland of patients below 10 years to be only 128mm^3. Concave superior surface was mostly observed in children below 10 years of age and adults above 50 years of age. Superior surface in most of the cases was flat. A sudden increase in the volume of the gland during puberty is a well-known fact. [7-9] Similarly, in our study we found the maximum size of the gland to be in pubertal females. Studies done previously suggest that changes in the morphology of the gland are due to the hormone levels. The above-mentioned increase in pituitary height during puberty can be related to the increased production of Luteinizing Hormone (LH) during this time of growth. The decreased in the pituitary height with age also shows the changes in the endocrine status with aging and also physiological atrophy of the pituitary gland.[4]

Furthermore, we also observed that among the parameters that we studied including height, AP diameter, TR diameter and volume, pituitary gland height changed most remarkably with respect to age and sex. This is in partial agreement with the belief that mid-sagittal height of the pituitary gland reflects the variation in pituitary morphology more accurately.[6, 10]

Some of the previous studies [4, 6] show a second surge in pituitary height in the fifth decade of life which is more pronounced in females but was not observed in our study. Correlation between age and volume of the gland was non-significant in accordance with previous studies.[6, 11]

LIMITATION

Since this was a hospital-based study from a single-center, its findings may not apply to all populations and the fact that since MRI is an expensive study there was a selection bias as normal volunteers declined for this study.

CONCLUSION

MRI is the best modality for assessing the size and shape of pituitary gland. This study provides the normal range of pituitary dimensions and volume and its variation according to age and gender among Nepali population. The maximum size of the gland was observed in the second decade and a large size was more pronounced in the female population. The data collected may be used for future larger studies regarding the normal pituitary gland. Maximum height and volume are observed in puberty and a decrease in gland size reflect physiological atrophy of the gland with age.

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ORIGINAL ARTICLE

Correlation of Epithelial Cell Abnormality in Cervical Cytology with Cervical Histology

Shrestha R[1], Sinha K[2], Sharma N[2], Shrestha A[3]

ABSTRACT

Introduction: Cervical cancer is the second most common cancer in females worldwide and third most common cancer in Nepal. Conventional Pap smear is the most widely used screening tool for detecting premalignant and malignant lesions of cervix. Cytohistological correlation of Pap smear is a widely accepted method for analysis of various factors leading to discrepancies in diagnosis and internal quality assurance. **Aim**: To study the cytohistological correlation of epithelial cell abnormality in Pap smear in Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke, Nepal. **Methods:** This is a hospital based prospective cross sectional study carried out at Department of Pathology, NGMC, Kohalpur, Nepal from August 2018 to January 2020. The study included 137 cases of Pap smear with epithelial cell abnormality and correlated with corresponding histopathological findings. **Results:** The age of patients ranged from 20-80 years with the number of cases seen in the range of 30-39 years (n=44; 32.1%). Whitish discharge per vaginum was most common presenting symptom. High grade squamous intraepithelial lesion (HSIL) was the most common abnormal finding in Pap smear with a frequency of 40 (29.1%) cases. Out of 137 cases of Pap smear 57 (41.6%) cases showed discrepancies in cervical biopsy. All cases of Squamous Cell Carcinoma (SCC) were correctly diagnosed by Pap smear. The overall sensitivity of smear test was 84%. After evaluating cytohistological correlation, the Positive Predictive Value (PPV) was found to be 100% for SCC, 52% for HSIL and 59% for Low grade squamous intraepithelial lesion (LSIL). **Conclusion**: The current study revealed a good correlation between cervical cytology and biopsy in Pap smear showing epithelial cell abnormalities. Thus, cytology and histology are complementary to each other and helps to reduce discrepancies.

Keywords: **Cytohistological correlation, High grade squamous intraepithelial lesion, Low grade squamous intraepithelial lesion, Pap smear**

Authors:

1. Dr. Richa Shrestha
2. Dr. Kavita Sinha
3. Dr. Nirmala Sharma
4. Dr. Anil Shrestha

[1] Department of Pathology, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

[2] Department of Obstetrics and Gynaecology, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

[3] Department of Medicine, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

Address for Correspondence:

Dr. Richa Shrestha
Department of Pathology
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: shresthericha@hotmail.com

INTRODUCTION

Cancer of the cervix is the second most common cancer in developing countries following breast cancer and ranks fourth globally.[1] It is third common cancer in females in Nepal.[2] Human Papilloma Virus (HPV) is considered as the primary factor in the development of cervical cancer. Poor living condition, lack of hygiene, early age of first intercourse, multiple sexual partner are other etiological factors.[3] Cervical cytology using the Papanicolaou (Pap) smear is most commonly used cervical cancer screening method in developing countries, despite of other advanced tests for high risk HPV, which is not available widely. A significant decrease in the incidence and mortality of cervical cancer is due to effective cervical cytology screening program.Although cervical cytology is considered effective for screening of precancerous conditions of cervix, its false negative yield due to sampling and interpretation error is still a reason of concern. Thus histological correlation of Pap smear is one of the recommendations of the European guideline for quality reassurance to reduce false negative results.[4]

Thus the present study has been carried out to evaluate the cytohistological correlation of cervical lesion in Pap smears with epithelial cell abnormalities.

METHODS

This is a hospital based descriptive study conducted over the period of August 2018 to January 2020 in Department of Pathology, NGMC, Kohalpur, Banke, Nepal. Informed verbal consent from the patient and permission of the institutional review committee (IRC) of the hospital was also obtained. Total 137 Pap smears with epithelial cell abnormality were included in the study whose corresponding histopathological sample was also received in the form of cervical biopsy or hysterectomy performed for various indications. The study group included women of different age group who were attending gynecology outpatient department (OPD).

Inclusion Criteria

- Epithelial cell abnormality in Pap smear.
- Cervical biopsy on the corresponding patient for histopathological study.

Exclusion Criteria

- Negative for Intraepithelial lesion and Unsatisfactory smears for evaluation in Pap cytology.
- Epithelial cell abnormality in Pap smear without cervical biopsy of same patient.

The Pap smears were taken with the Ayer's spatula on a clean glass slide and fixed immediately in 95% ethanol and ether.[5] Staining of the slides were performed by means of the conventional Pap technique and was reported according to the Bethesda for cervical cytology 2014 and biopsies were advised for correlation. Tissue sample obtained was fixed in 10% neutral buffered formalin and processed routinely with final embedding in paraffin blocks and stained with hematoxylin and eosin (H&E).[6] Biopsy results were evaluated with the Cervical Intraepithelial Neoplasia (CIN) classification and the correlation with Pap smear was studied.

Biopsy reports were categorized as nonneoplastic (cervicitis, polyps and immature squamous metaplasia), CIN I (LSIL), CIN II and CIN III (HSIL) and Invasive carcinoma according to World Health Organization (WHO) classification.[7] Pap smear cytology reports were categorized according to Bethesda for cervical cytology- 2014.[8] Data were analyzed using Microsoft excel 2010 and standard statistical software SPSS 20.0.

RESULTS

A total of 137 cases were included in the study. All of them had abnormal Pap smear finding that fulfilled the epithelial cell abnormality criteria according to the Bethesda -2014. The peak age group was between 30-39 years (44 cases, 32.1%), as shown in table I. The mean age of the patient was 38.5. The most common presenting complain was whitish discharge per vagina (52%) followed by pain lower abdomen (40%). There were 37 (26.9%) cases of Low grade squamous intraepithelial lesion (LSIL), 40 (29.1%) cases of High grade squamous intraepithelial lesion (HSIL), 30 (22%) cases of Atypical squamous cell of undetermined significance (ASC-US), 13 (9.6%) cases of Atypical squamous cells cannot exclude a high-grade squamous intraepithelial lesion (ASC-H), 7 (5.2%) cases of Atypical Glandular cells Not otherwise specified (AGCNOS), and 10 (7.3%) cases of Squamous cell carcinoma (SCC) on Pap smear cytology. On histopathology, there were 22 (16.1%) Nonneoplastic cases, 40 (29.1%) CIN I cases, 20 (14.7%) CIN II cases, 25 (18.2%) CIN III cases, 28 (20.4%) SCC and 2 (1.5%) Adenocarcinoma (Table II). Out of 30 cases of ASC-US, 16 was CIN I followed by 8 nonneoplastic cases on histopathology. Out of 37 LSIL in Pap smear, 22 was CIN I in biopsy. Including both HSIL and ASC-H (40 and 13 cases respectively), 27 were accurately diagnosed as CIN II and III in biopsy (11 and 16 cases respectively). All 10 SCC in Pap smear was diagnosed as invasive SCC in biopsy. Out of 7 AGCNOS, 2 were adenocarcinoma. The most common histopathological finding was CIN I (40 cases; 29.1%) followed by SCC and CIN III (28 cases; 20.4% and 20 cases; 14.7% respectively). The correlation of malignancy in Pap smear with histopathology was statistically significant with p valve of <0.001. The sensitivity of cytology was 84% with false positivity of 16%. We were unable to calculate specificity, and negative predictive value as there were no real negative or false negative cases in cytology.

The correlation was calculated using Positive Predective Value (PPV) in our study data and showed increased cytohistological correlation with CIN as the degree of epithelial cell abnormality increased. This was matched based on the Bethesda terminology counterpart of the smear result with CIN terminology of the biopsy result. The PPV was 100% for SCC, 52% for HSIL , 59 % for LSIL and 28% for AGCNOS (Table III). Out of 137 cases, 80 cases (58.4%) showed concordance between Pap smear and cervical biopsy while discrepancies was seen in 57 (41.6%) cases (Table IV).

Age (Year)	Frequency	%
20-29	8	5.9%
30-39	44	32.1%
40-49	37	27.0%
50-59	36	26.3%
60-69	11	8.0%
70-80	1	0.7%
TOTAL	**137**	**100%**

Table I : Distribution of ages groups

Pap Smear Diagnosis	Histopathological Diagnosis							P Value
	Non-Neoplastic	CIN I	CIN II	CIN III	SCC	Adeno-carcinoma	Total	
LSIL	8 (5.8%)	22 (16.0%)	7 (5.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	37 (26.9%)	
HSIL	2 (1.5%)	1 (0.7%)	7 (5.1%)	14 (10.1%)	16 (11.6%)	0 (0.0%)	40 (29.1%)	
ASCUS	8 (5.8%)	16 (11.7%)	4 (3.0%)	2 (1.5%)	0 (0.0%)	0 (0.0%)	30 (22.0%)	<0.001
ASCH	0 (0.0%)	0 (0.0%)	2 (1.5%)	9 (6.6%)	2 (1.5%)	0 (0.0%)	13 (9.6%)	
AGCNOS	4 (3.0%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.5%)	7 (5.2%)	
SCC	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	10 (7.3%)	0 (0.0%)	10 (7.3%)	
TOTAL	22 (16.1%)	40 (29.1%)	20 (14.7%)	25 (18.2%)	28 (20.4%)	2 (1.5%)	137 (100%)	

Table II: Correlation of Pap smear and histopathological diagnosis with P valve

Cytopathological Diagnosis	Histopathological Diagnosis	PPV
LSIL	CIN I	59%
HSIL	CIN II & III	52%
SCC	SCC	100%
AGCNOS	Adenocarcinoma	28%

Table III: Positive Predictive Values of cyto-histopathologic diagnosis

Pap Smear Diagnosis	Concordant Cases	Discordant Cases	Total cases
LSIL	22	15	37
HSIL	21	19	40
ASCUS	16	14	30
ASCH	9	4	13
AGCNOS	2	5	7
SCC	10	0	10
TOTAL	**80 (58.4%)**	**57 (41.6%)**	**137 (100%)**

Table IV: Concordance and discordance cases between Pap smear and cervical biopsy

DISCUSSION

Most of the cervical cancer arises from the transformation zone, which can be detected by a good Pap smear. The Pap smear is regarded as an ideal screening tool worldwide for sexually active women.[9-11]

Cervical Pap smear is a widely used screening test as it is simple and cost effective in developing countries like Nepal. The aim of cervical screening test is to enable early detection and treatment of precancerous and cancerous lesion and prevent mortality due to cervical cancer. However, it has a high false negative rate ranging from 1.1-30 %, as shown in various studies.[12,13] This is due to variation in sampling technique, smear preparation and difference in impression among expertise. Thus, comparing cytological impression with cervical biopsy is considered as immediate gold standard method to reduce the false negative rate.

This study is done to enhance the role of Pap smear in gynaecology cytology and its correlation with biopsy which provides important information regarding resolving the discrepancies or confirming the diagnosis by histology. [14] In the present study, maximum number of cases were in the age group 30-39 years (41 cases), which is similar to studies done by Bamanikar SA et al, Likhar KS et al, Kaveri SB et al and Joshi et al.[15-18] Whitish discharge per vaginum was the most common presenting symptom as reported in other similar studies.[16-18]In this study, HISL was the most common abnormal finding in Pap smear with 29.1% of all smears examined. Similar observations were made by Shah R et al[19] and Fatima NK et al[14], followed by LSIL in 37 (26.9%) and ASCUS in 30 (21.2%). Most common histopathological diagnosis among women with abnormal Pap smear was CIN I which accounted for 40 (29.1%) of cases. Similar finding was observed in other studies.[3,14,18,20-22] All 10 cases of SCC on PAP smear were diagnosed as invasive SCC in histopathology. Similar observation was made by Fathima NK et al[14,] Joshi C et al[18] , Abali R et al[20] and Poudel A et al.[21]

We found nonneoplastic changes in 8 cases, CIN I in 16 cases, CIN II in 4 cases and CIN III in 2 cases of total 30 ASC-US cases. The total rate of CIN among cases with an ASC-US smear result was 73%. The cases with ASC-H diagnosis in PAP smear was diagnosed as CIN II in 2 cases, CIN III in 9 cases and SCC in 2 cases by biopsy. The higher rate of CIN in cases reported as ASC-US and ASC-H in Pap smear indicated a need of close follow up and cervical biopsy in these patients. This observation was also seen in a study done by Abali R et al.[20] The false positive cases in this study showed chronic cervicitis or inflammation related regenerative changes which increased the rate of smear reported as ASC-US.

This study showed increased cytohistological correlation with Cervical Intraepithelial lesion as the degree of epithelial cell abnormality increased in Pap smear which is similar to study done by Abali R et al.[20] In this study, concordance and discordance between Pap smear and histopathology is 58.4% and 41.6%, with the increased concordance rate, which is also seen in study done by Poudel A et al[21], Jain RV[22] and Jyothi R et al.[23]

LIMITATIONS

Limitation of this study is that all the biopsies were not performed using colposcopy, which could cause error in identifying most suspicious area of cervix for taking biopsy and histopathological study resulting in false negative diagnosis. Thus colposcopy and colposcopy guided biopsy of cervix should be used along with Pap smear for increasing the accuracy of detection of cervical lesion.

CONCLUSION

Pap smear is an ideal screening test for detection of precancerous and cancerous cervical lesion. However, under certain conditions, it may give false positive impression of neoplasia. Thus, it is necessary to perform a cervical biopsy which is considered to be the gold standard in cases of epithelial cell abnormality in Pap smear. The current study result supported a good correlation between cervical cytology and histopathology concluding that conventional Pap smear is a cost effective, simple and quick method of detection of precancerous and cancerous cervical lesion.

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ORIGINAL ARTICLE

Role of Cortical Mastoidectomy in the Management of Safe Chronic Otitis Media

Verma LR[1], Paudel DR[1]

ABSTRACT

Introduction: Role of cortical mastoidectomy in tympanoplasty for Chronic Otitis Media Mucosal inactive disease is controversial. Some arguments are in favor and suggest that cortical mastoidectomy increases the air reservoir in the mastoid and also help in achieving the patency of aditus but others believe that the ingrowths of squamous epithelium, potential for injury to the inner ear structures and facial nerve during mastoid surgery outweighs the beneficial effects on tympanic membrane healing. **Aim:** To assess the hearing improvement and graft uptake in patients undergoing Tympanoplasty and Tympano-mastoidectomy in chronic otitis media mucosal inactive disease. **Methods:** This was a comparative study comprises of 50 patients with Chronic Otitis Media Mucosal inactive ear, conducted in the patients attending the department of ENT in NGMC teaching hospital from Nov 2017 to May 2019. All cases were operated during a period of one half year. 25 patients were selected for tympanoplasty (Group A) and 25 patients were selected for Tympanoplasty with cortical mastoidectomy (Group B). **Results:** There were 14(28%) male and 36(72%) female, with mean age of 28. 36 years, ranging from minimum of 13 years to maximum 56 years. The postoperative audiograms were recorded after 3 months. Type I tympanoplasty with cortical mastoidectomy has better graft uptake (96%) as compared to without mastoidectomy (84%). Post-operative hearing improvement is almost equal in tympano-mastoidectomy (13.24 dB) and tympanoplasty (13.04 dB). **Conclusion:** Post-operative hearing gain almost equal in both study group but graft uptake was better with tympano-mastoidectomy then tympanoplasty alone in present study.

Keywords: **Chronic Otitis Media (COM), Inactive, Mucosal, Tympanoplasty, Tympano-mastoidectomy.**

Authors:

1. Dr. Lok Ram Verma
2. Prof. Dhundi Raj Paudel

[1] Department of Otorhinolaryngology, Nepalgunj Medical College and Teaching Hopital, Banke

Address for Correspondence:

Dr. Lok Ram Verma
Department of Otorhinolaryngology
Nepalgunj Medical College and Teaching Hospital
Nepalgunj, Banke, Nepal
Email: lokramverma@gmail.com

INTRODUCTION

Otitis media is defined as "an inflammation of the middle ear without reference to etiology or pathogenesis." Otitis media also implies concomitant inflammation, to a greater or lesser extent, of the mastoid air cell system, owing to its anatomic linkage to the middle ear cleft (i.e., the tympanic cavity). Accordingly, otitis media is more correctly conceived of as an inflammatory disorder of the entire tympanomastoid compartment.[1] It is one of the commonest ear diseases of all age groups and it is caused by multiple interrelated factors including infections, eustachian tube dysfunction, nasal allergy and trauma. The disease Chronic Otitis Media (COM) has been classified on the basis of its underlying pathology as active or inactive mucosal, active or inactive squamous and healed chronic otitis media.[2] According to Jackler and Schindler many factors contribute to success or failure of surgery which are divided into mastoid and non-mastoid factors.[3] Non mastoid factors are age, general debility, and eustachian tube dysfunction, septic focus in non-mastoid areas, cochlear reserve and ossicular chain status. Mastoid factors are extent of pneumatization and presence of inflammatory disease in mastoid. Holmquist and Bergstorm in 1978 said that well aerated mastoid is a prerequisite for well ventilated middle ear and long lasting success.[4] The term tympanoplasty was first used in 1953 by Wullstein to describe surgical techniques for reconstruction of the middle ear hearing mechanism that had been impaired or destroyed by chronic ear disease.[5] Role of cortical mastoidectomy in tympanoplasty for COM Mucosal inactive disease is controversial. Those arguing in favor suggest that cortical mastoidectomy increases the air reservoir in the mastoid and also help in achieving the patency of aditus but the rationale use for the addition of simple mastoidectomy to tympanoplasty does not universally accepted, with the fear that an unoccluded antrum would invite the ingrowths of squamous epithelium. Others believe that the potential for injury to the inner ear structures and facial nerve during mastoid surgery outweighs the beneficial effects on tympanic membrane healing.[6]

The aim of this study is:

1. To assess the graft uptake in patients undergoing tympanoplasty and Tympanomastoidectomy in COM mucosal inactive disease.
2. To compare the hearing improvement in patients undergoing tympanoplasty and Tympanomastoidectomy in COM mucosal inactive disease.

METHODS

The present prospective study was conducted in the Department of Otorhinolaryngology, Nepalgunj Medical College, Teaching Hospital Nepalgunj, Banke, Nepal. The total number of cases included in the study was 50. A detailed history followed by general physical and detailed ENT examination was done in all patients and diagnosis recorded. These cases were subjected to routine investigations (Complete Blood count and Urine analysis) and specific investigations. Pure Tone Audiometry (PTA) was done by ALPS Advanced Digital Audiometer AD 2100 in a sound proof room. Otomicroscopy was done to reconfirm the otoscopic finding, middle ear mucosal status, middle ear epithelization and status of attic region. All patients had undergone X-ray Mastoid Schuller's view to see for the status of pneumatization of mastoid and findings were recorded as well pneumatized and sclerotic. Depending on the clinical diagnosis and mastoid pneumatization of the patient they were divided into two groups.

- Group A - 20 patients underwent tympanoplasty.
- Group B - 20 patients underwent Tympano-mastoidectomy.

Written and informed consent was taken before surgery. Ethical clearance was obtained from IRC (NGMC). Tympanoplasty and tympanomastoidectomy was done. Patient was watched for soakage of dressing, vertigo, facial nerve status, otalgia, headache etc. and discharged on 2nd day after re-dressing. First visit was at 7 post-op days for removal of dressing, cotton/ ribbon plug and stitches. Patients were advised to start a topical antibiotic ear drops for two weeks. Second visit was done at 21 post-op days for, subjective evaluation (hearing, tinnitus, and any other complaints) and status of post aural wound. Third visit was done at one and half month post-operative day for subjective evaluation (hearing, tinnitus, and any other complaints) and post aural wound and status of graft by otoscopy. Fourth visit was at 3 months post op for subjective evaluation and PTA was repeated. These findings were then evaluated and compared with preoperative findings.

RESULTS

Age and Sex Incidence

The study conducted in the patients attending the department of ENT in NGMC teaching hospital from November 2017 to May 2019. During the period under study, a total of 50 patients with established chronic otitis media inactive were studied. 14(28%) were males and 36(72%) females. Their ages ranged from 13 year to 56 years with mean age was 28.36± 11.56 days. Patients in the age group of 10-20 years were 16 (32%), followed by 21-30 were 17(34%), 31-40 were 9(18%), 41-50 were 5(10%) and >50 were 3(6%).

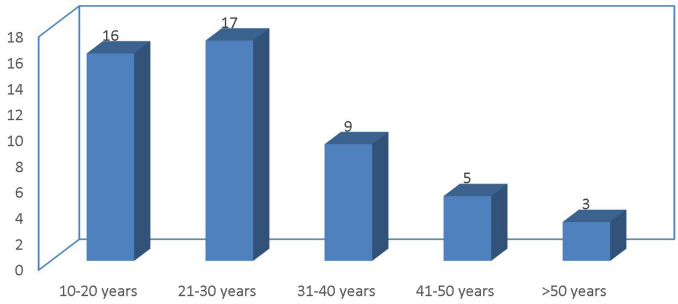

Figure 1 : Age distribution

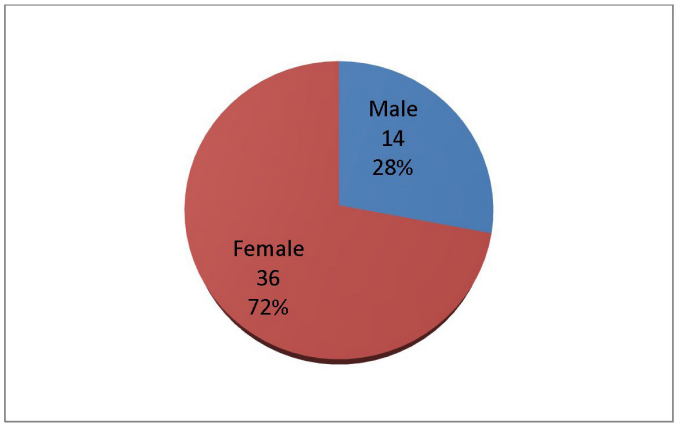

Figure 2 : Sex distribution

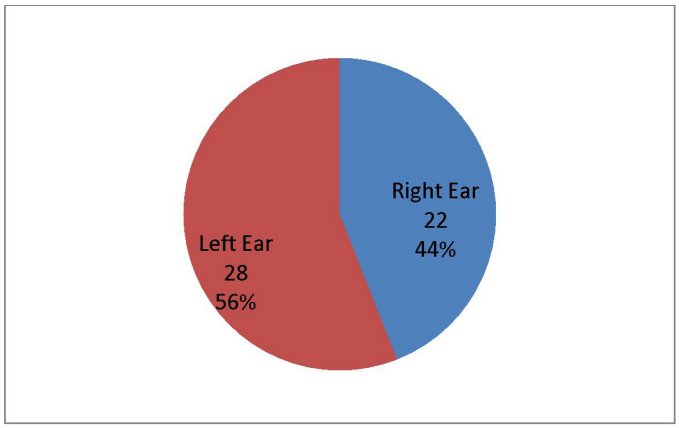

Figure 3 : Laterality

Ear Involved

Figure 3 show that right ear involvement was seen in 22(44%) cases. The left ear was seen to be involved in 28(56%) of the cases. Out of the 50 cases, the disease was unilateral in 39(78%) patients and bilateral in 11(22 %) patients.

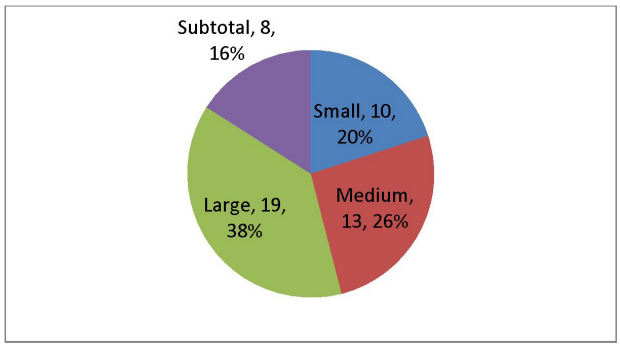

Figure 4 : Type of perforation

Size of Perforation

Figure 4 show the type of perforation. Large perforation was seen in 19 (38 %), followed by medium perforation 13(26 %), small perforation 10(20%) and subtotal perforations was seen in 8 (10%) of the patients.

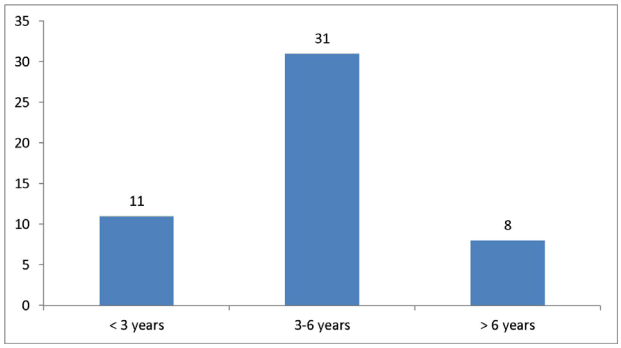

Figure 5 : Duration of Ear Discharge

Duration of Ear Discharge

Figure 5 show duration of ear discharge. In maximum number of patients, 31(62 %), the duration of ear discharge was 3–6 years, followed by 11(22%) and 8(16 %) of the patients where the duration was seen to be <3 and >6 years respectively.

Pre-op Audiological Assessment

The preoperative AC threshold was (43.44 ± 4.34) for Group "A" patients undergoing tympanoplasty and (36.16 ± 4.39) for Group "B" patients undergoing Tympano-mastoidectomy (Table I). In present study preoperative mean A–B gap in Groups A and B was (21.36 ± 3.12 dB) and (21.64 ± 3.06dB) respectively.

Group	A	B
Pre-op AC Threshold (mean ± SD)	43.44 ± 4.34	36.16 ± 4.39
Pre-op AB Gap (mean ± SD)	21.36 ± 3.12	21.64 ± 3.06

Table I : Pre-op Audiological Assessment

Mastoid Pneumatization

Radiologic condition was noted in every patient. Pneumatic mastoid was observed in 9(18 %) patients and sclerotic mastoid in 41(82 %) patients. In group "A" Pneumatic mastoid was 7 (28%) patients and sclerotic mastoid 18 (72%) patients. In group "B" Pneumatic mastoid was 2 (8%) patients and sclerotic mastoid 23 (92%) patients.

Graft Uptake

Table II shows the status of graft after 3 months follow up. Results were taken as positive if graft was taken up and negative if it was not taken up. It shows that in Group "A" graft take up rate was 21(84%) and in Group "B" it was 24(96%).

Group	A	B	P value
Positive	21 (84%)	24 (96%)	0.157
Negative	4 (16%)	1 (4%)	

Table II : Graft Uptake

Post-op Audiological Assessment

Postoperatively AC hearing threshold was (26.40 ± 1.29 dB) in Group A and (26.92 ± 2.19 dB) in Group B. The average gain in air conduction threshold was 13.04 ± 6.54 in patients who had undergone tympanoplasty while the gain seen in patients who had undergone Tympano-mastoidectomy was 13.24 ± 5.52. However this was not statistically significant (Table III). In this study preoperative mean A–B gap in Groups A and B was (21.36 ± 3.12 dB) and (21.64 ± 3.06 dB) respectively. Postoperatively mean AB gap was (12.00 ± 1.63 dB) in Group A and (11.92 ± 2.85 dB) in Group B. Overall AB gap gain was (9.36 ± 3.77 dB) for Group A and (9.72 ± 3.75 dB) for Group B (Table IV).

Group	A	B	P-value
Pre-op AC Threshold	43.44 ± 4.34	36.16 ± 4.39	0.00
Post-op AC Threshold	26.40 ± 1.29	26.92 ± 2.19	0.313
AC Threshold gain	13.04 ± 6.54	13.24 ± 5.52	0.914

Table III : Post-op Audiological Assessment (AC Threshold)

Group	A	B	P-value
Pre-op A-B Gap	21.36 ± 3.12	21.64 ± 3.06	0.750
Post-op A-B Gap	12.00 ± 1.63	11.92 ± 2.85	0.904
A-B Gap gain	9.36 ± 3.77	9.72 ± 3.75	0.737

Table IV : Post-op Audiological Assessment (A-B Gap)

DISCUSSION

In the present study, 50 patients in the age group of 13–56 years of either sex were selected from Ear, Nose and Throat Outpatient Department of NGMC, Nepalgunj Teaching Hospital, Nepalgunj. A detailed history, clinical examination and investigations were done as per the performa. Pure tone audiometery was done to assess hearing loss before and 3 month after surgery.

Age & Sex Incidence:

In this study, the age group ranged from 13 to 65 years with maximum number of patients 17 being between the age group of 21–30 years followed by 16 patients between age group 10-20 years. The mean age of patients in our study was 28 years. In a study done by Chavan et al, the mean age of presentation was also 28 years[6]. In present study there was female preponderance as compared to male patients. Overall 36(72 %) were females while rest 14(28%) patients was males.

Ear Involved:

The right ear involvement was seen in 22(44%) cases. The left ear was seen to be involved in 28(56%) of the cases. Out of the 50 cases, the disease was unilateral in 39(78 %) patients and bilateral only in 11(22 %) patients.

Duration of Ear Discharge:

The duration of ear discharge ranged from 2 years to 9 years. Maximum number of patients, that were 31(62 %) cases, had duration of ear discharge of 3-6 years fallowed by11(22%) patients gave history of ear discharge for a duration of < 3 year and 8(16 %) had a history of ear discharge of >6 years. In a study conducted by Kabdwal et al. 37.5 % of the patients presented with a history of ear discharge for 10–15 years.[7] Longer duration of ear discharge shows lack of awareness about the disease and its complications.

Present study revealed that the most common type of perforation seen was large perforation, seen in 19(38 %), followed by medium perforation 13(26%), small perforation 10(20%) and subtotal perforations seen in 8(10 %) of the patients.

Radiological Condition of Mastoid:

Radiologic condition was noted in every patient. Pneumatic mastoid was observed in 9(18%) patients and sclerotic mastoid in 41(82%) patients of the patients in our study, while 93% of the patients in the study done by Sharma et al. were observed to have a sclerotic mastoid[7].

Graft Uptake In the present study, the success was defined as intact graft at least 3 months postoperatively. The success rate was in terms of graft uptake rate which was 84% with tympanoplasty, and 96% with Tympano-mastoidectomy. These findings were consistent with those of the study done by Chavan et al.[6] it was observed that the success rate of graft uptake was also seen to be 100% with Tympano-mastoidectomy in the studies conducted by Sharma et al.[7] and Nayak et al.[8] However in the study conducted by Yasuo et al.[9] the graft uptake was seen to be slightly better with tympanoplasty (94.4 %) than with Tympano-mastoidectomy (90.7%).

Study	No of cases	Group A Tympanoplasty	Group B Tympano-mastoidectomy
Present Study	50	84%	96%
Chaven et al	150	93.3%	97.3%
Sharma et al	40	95%	100%
Nayak et al	40	60%	100%
Yasuo et al	251	94.4%	90.7%

Table V : Graft Intake

Hearing Improvement

In present study, we observed that the hearing gain in patients undergoing Tympano-mastoidectomy was 13.24 dB and the gain seen in patients undergoing tympanoplasty was 13.04dB. This was seen to be statistically significant up to a level of 5%. According to a study conducted by Kabdwal et al.[10] the average hearing gain in patients who underwent tympanoplasty alone was 7.8 dB and the gain in patients who underwent Tympano-mastoidectomy was 3.5 dB. In the study, conducted by Sharma et al.[7] the hearing gain in patients underwent Tympano-mastoidectomy was 20.48 dB and the gain seen in patients underwent tympanoplasty was 15.75 dB. Table VI.

Study	No. of cases	Group A Tympanoplasty	Group B Tympano-mastoidectomy
Present study	50	13.04 dB	13.24 dB
Kabdwal et al.	57	7.80 dB	3.50 dB
Sharma et al.	40	15.75 dB	20.48 dB

Table VI : Hearing improvement

In our study preoperative mean A–B gap in Groups A and B was (21.36± 3.12dB) and (21.64 ± 3.06 dB) respectively. Postoperatively mean AB gap was (12.00± 1.63dB) in Group A and (11.92± 2.85dB) in Group B. Overall AB gap gain was (9.36± 3.77dB) for Group A and (9.72± 3.75) for Group B. Hence there was a significant improvement seen in the ABG in both group in our study. The average gain in air conduction threshold was 13.04± 6.54 in patients who had undergone tympanoplasty while the gain seen in patients who had undergone Tympano-mastoidectomy was 13.24± 5.52. However this was not statistically significant.

LIMITATION

To establish strong indication and statistical significance about role of mastoidectomy the management of safe Chronic Otitis Media, it requires large sample size and multicenter study.

CONCLUSION

Depending on our observation we concluded that hearing improvement are equal in both study group. However tympano-mastoidectomy may have beneficial effect on the post-operative healing and graft uptake. To establish strong indication and statistical significance about role of mastoidectomy, it requires large sample size and multicenter study.

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Knowledge, Attitude and Practice of Self-Medication among Nursing Students of Nepalgunj Nursing Campus Kohalpur Banke

Dhami DB[1], Dhakal S[2]

ABSTRACT

Introduction: Self-medication is widely practiced among the nursing students because of easy availability and accessibility of the drugs. Inappropriate self-medication can leads to increased resistance among pathogens, wastage of resources, can cause serious harm and increase morbidity; which indicates needs of responsible self-medication. **Aim**: This study was to assess the self-medication knowledge, attitude and practice among nursing students. **Methods**: This was a questionnaire based descriptive cross sectional study conducted in Nursing students of Nepalgunj Nursing Campus, Kohalpur, on August 2019. Questions related to various aspects of self-medication was used for data collection. **Results:** Out of 120 students, 102 (85%) students were found practicing self-medication with reason of no need to visit the doctor for minor illness 78%, for quick relief 75% and for time saving 50%. Only 15% not taken self-medication reasoning there was risk of adverse effects 65% and risk of using wrong drugs 60%. The source of information of the drugs used for self-medication was previous prescription and text book was 50% and 35% respectively and the source of the drugs was medical store, 88.2%. Majority of 96% took for headache followed by fever 83.3%; menstrual symptoms 68.6%; and cough and cold 68.6% and dirrhoea 64.7%. Most of the students 96% took analgesics and antipyretics drugs. **Conclusion:** Our study shows that self-medication is significantly practiced by nursing students. There is need to aware them about advantages and disadvantages of self-medication in order to ensure safety and proper use of drugs.

Keywords: **Attitude and Practice, Knowledge, Nursing students, Self-medication**

Authors:

1. Dr. Dabal Bahadur Dhami
2. Mrs. Sanjeeva Dhakal

[1]Department of Pharmacology, Nepalgunj Medical College, Chisapani, Banke

[2]Department of Nursing, Nepalgunj Nursing Campus, Kohalpur, Banke

Address for Correspondence:

Dr. Dabal Bahadur Dhami
Department of Pharmacology
Nepalgunj Medical College
Chisapani, Banke, Nepal
Email: drddhami@gmail.com

INTRODUCTION

Self-medication is use of drugs to treat self-diagnosed disorders or symptoms or the intermittent or continued use of a prescribed drug for chronic or recurrent disease or symptoms.[1] Self-medication practice is a growing concern among nursing students and access to drugs and handling them in their future practice makes nursing students more susceptible to self-medication which can lead to incorrect or delay in diagnosis, increased resistance among pathogens, wastage of resources and leads to serious health hazards such as adverse drug reaction and increase morbidity because of drug interactions.[2,3,4,5] In this situation, we should educate the students about advantages and disadvantages of self-medication and about rationale use of drugs to the studetns.[6] Present study was to assess the self-medication practice and related knowledge and attitude among nursing students of Nepalgunj Nursing Campus.

METHODS

This descriptive cross-sectional study was conducted in nursing students of Nepalgunj Nursing Campus, Kohalpur, on August 2019, after getting permission from ethical committee of Nepalgunj Medical Campus. A total number of 120 PCL nursing students of first, second and third year were included in the study. Pre-validated questionnaire consisting of twelve closed end questions was used for data collection. The nature of study and the procedure of completing the questionnaire was explained to students. The collected data was entered on Microsoft excel and was summarized as counts and percentages.

RESULTS

All participated students were female. Mean age ± standard deviation in years was 18.42±1.07; range was from 17 to 22 years. Out of 120 students, 102 (85%) students were found practicing self-medication and the 18 (15%) not taken self-medication.

The source of information of the drugs used for self-medication was previous prescription 50%, text book 35%, advertise10% and classroom teaching 5%. In 98 (88.2%) the source of the drugs used for Self-medication was medical store.

Knowledge

Most common reasons for taking self-medication were that there was no need to visit the doctor for minor illness 78%, for quick relief was 75% and for time saving 50%. There was ease and convenience in taking self-medication (61%). (Table I)

Reasons	Percentages of students
No need to visit the doctor for minor illness	78%
Quick relief	75%
Time saving	50%
Confidence on your knowledge about medicines	15%
Economical	18%
Ease and convenience	61%
Learning opportunity	10%

Table I : Student's reasons in favour of self-medication

The most common reasons for not taking Self-medication were that there was risk of adverse effects 65%, risk of using wrong drugs 60%, risk of misdiagnosing 53% and lack of knowledge about medicines was 35% (Table II).

Reasons	Percentages of students
Lack of knowledge about medicines	35%
Risk of adverse effects	65%
Risk of using wrong drugs	60%
Risk of misdiagnosing	53%
Risk of drug dependence	20%
Risk of using drugs wrongly	30%

Table II : Student's reasons not taking self-medication

Attitude

In our study we found that out of 120 students 32% nursing students accepted the fact that they always visited a qualified practitioner whenever they fell ill, while 62% students said that they sometimes visited and 6% students visited rarely.

Practice

Among 102 self-medication practicing students, most of the students, 96% took self-medication for headache followed by fever, 83.3%; menstrual symptoms 68.6%; and cough and cold 68.6% and diarrhea 64.7%. (Table III).

Indications	Number of students (Percentages) n=102
Headache	98 (96%)
Fever	85 (83.3%)
Cough, cold, sore throat	70 (68.6%)
Stomach ache	20 (19.6%)
Menstrual symptoms	70 (68.6%)
Vomiting	38 (37.2%)
Diarrhea	66 (64.7%)
Ocular symptoms	8 (7.8%)

Table III : Student's indications for self-medication

Most of the students took analgesics and antipyretics drugs 96% followed by decongestant 63.7%, antispasmodics by 60% and lozenges and multi vitamins 44%. (Table IV).

Drugs	Number of students (Percentages) n=102
Analgesics/antipyretic	98 (96%)
Antimicrobials	30 (29.4%)
Multivitamins	45 (44%)
Antispasmodics	60 (58.8%)
Decongestants	65 (63.7%)
Lozenges	45 (44%)

Table IV : Drugs used for self-medication

DISCUSSION

In our study 102 (85%) students were found practicing self-medication, which is supported by the studies reported in india 88.24% by Goel Divya et al[7], 88.5% by Sankdia RK at al[8] 76% in Karachi by *Zafar SN* et al[9] ; 94.1% in Slovenia by *Klemenc-Ketis Z* et al[10;] 76.9% in Bahrain by James et al.[11]

In our study students gave reasons for taking Self-medication were that there was no need to visit the doctor for minor illness 78%, for quick relief was 75%, ease and convenience 61% and for time saving 50% and reasons given by rest of the students for not taking Self-medication were that there was risk of adverse effects 65%, risk of using wrong drugs 60%, risk of misdiagnosing 53% and lack of knowledge about medicines was 35%. Similar findings were there in the study done by Sankdia RK at al[8] and by James et al.[11]

In our study, we found that source of information of the drugs used for Self-medication was previous prescription 50% and text book 35%, this may be due to the fact that they had visited the doctor for the same illness previously and do not found it necessary to again visit the doctor for the similar complaints. The source of the drugs used for Self-medication was medical store 88.2%, this may be due to the high tendency of selling and purchasing medicines without the prescription of doctors in developing countries like us. Similar results were found in the study done by Sankdia RK at al[8] and by Klemenc ketis et al.[10]

We found that most of the students took analgesics for problem of headache and menstrual symptoms, this may be due to the strain on eyes while studying and lack of sleep and pain during menstrual period respectively for which they had to take analgesics and Significant students also took antipyretic for fever. Similar findings were there in study done by by Goel Divya et al[7]. Sankdia RK at al[8], by Zafar et al.[9], James et al.[11], Thadani et al.[12] and Phukan Swopna et al.[13]

LIMITATIONS

The limitations of this study were small sample size, non-comparison nursing students according to their knowledge level and study year, no appropriate dose, frequency and duration of medication and absence of interventions like hazards of irresponsible self-medication. It will be better if it had been done in large scale populations and Multicentric as well as medical and non-medical students with detail history of drug taken for self-medication with antibiotics.

CONCLUSION

Our study shows that self-medication is significantly practiced by PCL nursing students. It is due to the lack of awareness about the health hazards and high tendency of selling and purchasing medicines without the prescription of doctors in our country. Access to drugs and handling them in their future practice makes nursing students susceptible to self-medication. Although the practice of self-medication is inevitable, the awareness program should be initiated and curriculum should include for nursing about self-medication and government should strictly prohibit the selling and purchasing medicines without the prescription of doctors.

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ORIGINAL ARTICLE

Comparison of Tramadol with Combination of Tramadol and Ketorolac for Post Cesarean Section Analgesia

Regmi NK[1], Jahan K[2], Rai P[2], Bhandari A[2]

ABSTRACT

Introduction: Effective post-operative analgesia is mandatory following cesarean section (CS), as parturients need to recover quickly to breast feed and provide care for their newborns. Till date no single drug has been able to achieve this goal. Multimodal analgesia with opioids and non-steroidal anti-inflammatory drugs (NSAID) combination has shown promising results. **Aim**: To compare the analgesic efficacy, patient satisfaction and maternal adverse effects, between intravenous (IV) tramadol and multimodal analgesia with IV tramadol and IV ketorolac combination for post cesarean section analgesia. **Methods**: This is a prospective, randomized and single-blinded comparative study, conducted in 60 parturients who underwent Lower Segment Cesarian Section. They were divided into two groups: Group 1 (IV Tramadol 50 mg given 8 hourly) and Group 2 (IV Tramadol 50 mg + IV Ketorolac 30 mg given 8 hourly). IV Promethazine was given with each dose of tramadol in both groups. **Results**: The (Visual analogue scale) VAS scores were significantly low in IV tramadol + IV ketrolac group than with IV tramadol alone group at 2 hours and 12 hours with p value of 0.003 and 0.08 respectively. Rescue analgesia was significantly reduced in group 2 (p value 0.005). Patient satisfaction was good in group 2 and fair in group 1(p value 0.002). No maternal side effects were found. **Conclusions**: IV tramadol and IV ketorolac combination used for post cesarean section analgesia significantly decreases post-operative pain, need of rescue analgesia and significantly increases patient satisfaction in comparison to IV tramadol alone.

Keywords: **Analgesia, Caesarean section, Ketorolac, Post-operative, Tramadol**

Authors:

1. Dr. Nabin Kumar Regmi
2. Dr. Kamar Jahan
3. Dr. Purnima Rai
4. Dr. Ankur Bhandari

[1] Department of Anesthesia, Nepalgunj Medical College and Teaching Hospital, Nepalgunj, Banke

[2] Department of Obstetrics and Gynecology, Nepalgunj Medical College and Teaching Hospital, Nepalgunj, Banke

Address for Correspondence:

Dr. Nabin Kumar Regmi
Department of Anesthesia
Nepalgunj Medical College and Teaching Hospital
Nepalgunj, Banke, Nepal
Email: nabinkums@gmail.com

INTRODUCTION

Rate of Cesarean section is rising globally. As stated by Lancet, the global cesarean section rate was 21% in 2015. In Nepal it was 9% in 2016.[1] Adequate post-operative analgesia in the cesarean section patients is crucial as they have different surgical recovery needs which include breastfeeding and care of the newborn. These can be impaired if analgesia is unsatisfactory.[2] Yet there is no any "gold standard" analgesic for post CS pain management.[3] Multimodal and preventive approach to provide postoperative analgesia is gaining popularity these days[4]. NSAIDs and acetaminophen are commonly added to a post-caesarean analgesic regimen along with opioid medications to improve post-caesarean pain relief and reduce opioid requirements.[5] Tramadol, a centrally acting analgesic provides analgesia via multimodal mechanism involving the μ-opioid agonism, the noradrenergic and serotonergic reuptake inhibition at descending inhibitory pain pathway. It has been shown to provide effective analgesia for post-operative pain. However, for severe postoperative pain, the use of tramadol as the sole analgesic is not recommended.[6,7] Ketorolac is the NSAID of choice for post-cesarean section analgesia and has been used to control post-operative pain in immediate post-partum period in women for whom multi modal analgesia is indicated.[8,9] Solo tramadol, ketorolac and occasionally their combinations have been used in our institution for years. Limited studies exist in the literatures that compare the effects of tramadol alone with tramadol and ketorolac combinations as analgesic agents post-CS. So, in this study we tried to compare tramadol with tramadol and ketorolac combination taking pain intensity, rescue analgesia and patient satisfaction

needed as our primary outcomes whereas pruritus, respiratory depression, nausea and vomiting as our secondary outcomes.

METHODS

This is a prospective, randomized and single blinded comparative study. This study was conducted from Jan. 2020 to June 2020, in the department of anesthesiology, Nepalgunj Medical College, after taking approval from Institutional Review Committee. 60 parturient between the ages of 18 and 50 years, with an ASA grade I and II undergoing lower segment cesarean section under spinal anesthesia with plain 0.5% bupivacaine were enrolled, after taking written consent. No intrathecal opioids were administered. Patient with cardiac disease, asthma, bleeding disorders, peptic ulcer disease, renal injury/failure and hypersensitivity to any of the study drugs were excluded from the study. Patient on anti-platelets, anti-coagulants, antipyretics, antidepressant, antipsychotics and MgSO4 were also excluded.

In post-operative room parturients were divided into two groups randomly: Group 1 who received IV tramadol 50 mg 8 hourly and Group 2 who received IV tramadol 50 mg + IV ketorolac 30 mg 8 hourly. The analgesics were started as soon as the parturients were brought to post-operative room, as per randomization. IV Promethazine 25 mg diluted in 9 ml normal saline (Total Volume 10 ml) was given slowly over 5 minutes following each dose of tramadol in both the groups to counteract pruritus, nausea and vomiting that can be caused by tramadol. Pain intensity, rescue analgesia and patient satisfaction needed were our primary measures whereas pruritus, respiratory depression, nausea and vomiting were our secondary measures. Postoperative pain intensity was measured using a 10 cm Visual Analogue Scale labeled '0= no pain' to '10= worst pain imaginable' at 2, 6, 12, 18 and 24 hours following surgery. IM Diclofenac 75 mg was given as rescue analgesia at the request of the patients. The number of patients requiring rescue analgesia as well as the time it was taken was recorded. At the end of the 24 hours period, overall rating of satisfaction with quality of analgesia was done with 5 points Likert Scale. Very poor, poor, fair, good, and excellent patient satisfaction were considered as points 1, 2, 3, 4 and 5 respectively in this scale.[10]

Pruritus, respiratory depression, nausea and vomiting were noted.

STATISTICAL ANALYSIS

Data was analyzed using SPSS 20. Two sample T test and chi square test were used. P value and X^2 asymp. Sign. Value less than 0.005 were considered significant in T test and chi square test respectively.

RESULTS

There were total 60 patients in the study. The mean age in group 1 was 25.67±5.248 and in group 2 26.23.There was no significant difference in age between the two study groups. (Table I)

Variables	Group	N	Mean	Std. Deviation	P value
Age (Years)	Group 1	30	25.67	5.248	.669
	Group 2	30	26.23	4.953	

Table I : Comparison of age between the groups

VAS Score was significantly less in group 2 at 2hours and 12 hours postoperatively. (Table II, Figure 1)

Variables	Groups	N	Mean	Std. Deviation	P value
VAS Score 2 hours	Group 1	30	3.03	1.189	0.003
	group 2	30	2.17	0.986	
VAS Score 6 hours	Group 1	30	2.53	1.167	0.420
	group 2	30	2.30	1.055	
VAS Score 12 hours	Group 1	30	2.53	1.167	0.008
	group 2	30	1.83	0.747	
VAS score 18 hours	Group 1	30	2.40	1.404	0.466
	group 2	30	2.20	0.484	
VAS Score 24 hours	Group 1	30	1.83	0.592	0.074
	group 2	30	1.53	0.681	

Table II : Comparison of Pain Intensity (VAS Score) at different intervals

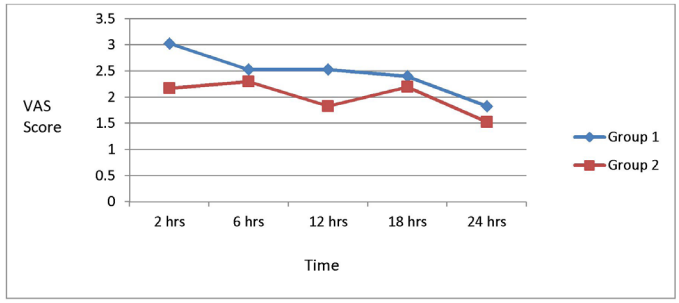

Figure 1 : Graph of mean VAS scores over 24 hours period

Requirement of rescue analgesia was significantly higher in group 1 in comparison to group 2. (Table III)

Variables		Group 1	Group 2	Total	P value
Rescue Analgesia (IM Diclofenac)	Not Given	16 (53%)	26 (87%)	42	0.005
	Given	14 (47%)	4 (13%)	18	
Total		30	30	60	

Table III : Comparison of requirement of Rescue Analgesia between the two groups

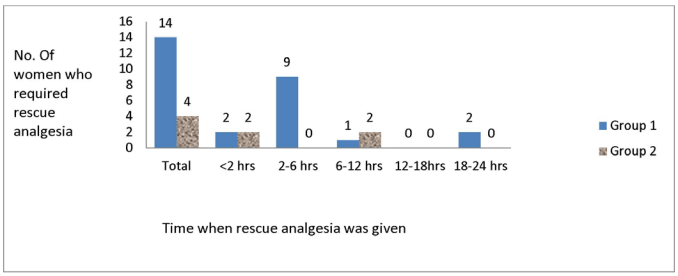

Figure 2 : Comparison of time for rescue analgesia given between the groups

No woman had likert scale score other than 3 (Fair) or 4 (Good). There was significant difference between fair and good satisfaction between the groups. (Table IV)

Overall pain Satisfaction taken at 24 hours (Likert Scale)	Group 1	Group 2	Total	P value
Likert Scale 3	19	7	26	0.002
Likert Scale 4	11	23	34	
Total	30	30	60	

Table IV : Comparison of overall pain satisfaction level between the two groups

No parturients complained nausea and vomiting in both the groups. None had pruritus, and respiratory depression.

DISCUSSION

Effective pain relief after cesarean section is a global challenge as both maternal and neonatal adverse effects are to be considered. Effective pain relief after cesarean section improves a woman's ability to function, breast feed and interact with her newborn infant. It increases maternal satisfaction, decreases maternal morbidity and hospital stay.[11] Post-cesarean pain consists of a somatic and visceral component. Visceral pain originates from uterine incision and contractions whereas the somatic component arises from the abdominal wall incision. It is unlikely that a single analgesic or targeted agent will significantly reduce most visceral pains since multiple neurotransmitters, channels, and receptors are responsible for visceral pain. Analgesics combinations are anticipated to be better than single analgesics.[12] Opioids are still playing a central role in post cesarean section pain management. However, from all published data, it is clear that opioids alone do not completely relieve pain after cesarean section.[13]To overcome this many centers around the world, combine opioid with non-opioid analgesics.[3] Tramadol being an atypical opioid, has very low risk of respiratory depression, pruritus and abusive potential compared to the classical opioids.[6] Tramadol with its relative infant dose of 2.4 – 2.9, has no reports of toxicity in breast fed infants after maternal use.[9,12] On top of that tramadol has a potency which is equal to pethidine and 1/10 of morphine.[14] NSAIDs should be given routinely in the immediate postpartum period, unless contraindicated. Among the nonsteroidal anti-inflammatory drugs investigated, ketorolac is safe in immediate post-partum breast feeding woman with relative infant dose 0.2 to 0.4. It has an analgesic efficacy similar to opioids.[9,11] IV Ketorolac produces opioid sparing effect by approximately 30%- 45%.[15,16]

In our study, VAS score was significantly decreased in ketorolac and tramadol group in 2 and 12 hours. Similar to our study, Lowder JL et al in their study found that ketorolac combined with opioids significantly decreases the VAS score in the first post-operative day of cesarean section in comparison to opioids and placebo.[17] The difference in VAS score was not significant at 6, 18 and 24 hrs. This insignificance at 6 hours could be because 9 parturients i.e. 64% of rescue analgesia receivers of group 1 received rescue analgesia between 2 to 6 hours. At 12 to 24 hours the intensity of pain might have decreased resulting in no significant difference in VAS. Our study shows multimodal analgesia with ketorolac and tramadol provides significant patient satisfaction (P value 0.002) than tramadol alone. A similar study done by Adamou N et al. found that multimodal analgesia with diclofenac and pentazocine provides statistically significant patient satisfaction (P-value 0.00001) than pentazocine alone in early post cesarean section pain control.[3]

Thippeswamy T et al. in their study found that, 35% women in tramadol only group required rescue analgesia in first 24 hours postoperatively[7], similarly 47% women of our tramadol only group required rescue analgesia which was significantly greater than 13% women in tramadol plus ketorolac group.

Despite the main side effect of tramadol being nausea and vomiting, there was no incidence of nausea and vomiting in our study. This result is similar to the result of study done by Shankariah M, where they used intraoperative antiemetics.[18] (Shankariah M), but is in contrast to result of Mitra S et al, where no prophylactic antiemetics were used and tramadol resulted in nausea and vomiting in 15% of parturients.[5]

Likewise pruritus not found in our study could be due to addition of promethazine with tramadol.

Respiratory depression was not found in any woman. Study done by Houmes RJ supports this result where 50 mg tramadol given 8 hourly, did not cause respiratory depression in any parturients.[19]

LIMITATION

Comparison of our study with the similar study was limited in the discussion, as only few studies exist in the literatures that compare tramadol with combination of tramadol and ketorolac as analgesic agents post-CS.

CONCLUSION

IV Tramadol and IV ketorolac combination used for post cesarean section analgesia significantly decreases post-operative pain, need of rescue analgesia and significantly increases patient satisfaction in comparison to IV tramadol alone.

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ORIGINAL ARTICLE

Functional Outcome of Galezzi Fracture Dislocation in Adults Treated With Dynamic Compression Plate and Kirschner Wire

KC D[1], Shrestha DK[1], Karki P[1], Shrestha S[1], Yogi S[1], Giri S[1]

ABSTRACT

Introduction: Galeazzi fracture-dislocation is a complex traumatic disruption of the distal radioulnar joint (DRUJ) that is associated with lower shaft radius fracture. Galeazzi fractures are extremely unstable, and the results of nonsurgical treatment are uniformly unsatisfactory. Galeazzi fractures managed with closed modalities have unsatisfactory clinical results in most of the patients in published literature so open reduction and internal fixation with plating is the standard treatment for this fracture. **Aim**: The aim of this study was to evaluate the functional outcome of Galeazzi fracture dislocation. **Methods:** This prospective study was conducted in the Department of Orthopedics at Nepalgunj Medical College Teaching Hospital Kohalpur, from April 2016 to March 2019. It included 35 patients of age group 19 to 49. All of the fractures in this study were treated by open reduction and internal fixation (ORIF) with 3.5 mm narrow dynamic compression plate (DCP) and cortical screws via Henrys anterior approach and distal radio-ulnar joint (DRUJ) stabilization was done with 1 Kirschner wire (K-wire) inserted parallel to the wrist joint. Patients were observed at 6, 10, 16 and 24 weeks and 52 weeks both radiographically and clinically. **Results:** In this study of 35 patients, 24 (68.57%) were males and 11 (31.43%) were females with the age range of 19 to 49 years and mean age of 35 and standard deviation (SD) of ±1.5 years. Majority of fractures were observed between 31 to 40 years of age. Most of the injuries were due to fall injury 51.42%. The average duration from time of injury to surgery was 5 days and bone grafting was not needed in any cases. The average time period for union was about 16 weeks. The most common complication seen in this study was stiffness of wrist (11.42%). Twenty four patients (68.57%) had good result, 10 patients (28.57%) had fair result and one patient (2.86%) had poor result in DASH score at final follow-up. **Conclusion:** Open reduction and internal fixation with plating and stabilization of distal radioulnar joint with K wire yields good to fair outcome on Disabilities of Arm, Shoulder and Hand Score.

Keywords: **Disabilities of Arm, Shoulder and Hand Score (DASH score), Galeazzi fracture, Kirschner wire (K-wire), Open reduction and internal fixation (ORIF)**

Authors:

1. Dr. Dipendra KC
2. Dr. Dinesh Kumar Shrestha
3. Dr. Prateek Karki
4. Dr. Sabin Shrestha
5. Dr. Sushil Yogi
6. Dr. Sagar Giri

[1] Department of Orthopedics, Nepalgunj Medical College & Teaching Hospital, Kohalpur, Banke

Address for Correspondence:

Dr. Dipendra KC
Department Of Orthopedics
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: drdipendrakc@gmail.com

INTRODUCTION

Galeazzi fracture-dislocation is a complex traumatic disruption of the distal radioulnar joint (DRUJ) that is associated with lower shaft radius fracture. This fracture pattern was first described by Cooper in 1822[1] but it is Galeazzi who in 1934 presented a series of 18 patients with this injury, and elaborated on the incidence, pathomechanics, and management.[2,3] This fracture is also eponymically referred to as a reverse Monteggia fracture,[4]a Piedmont fracture,[4]a Darrach- Hughston-Milch fracture,[5]and a fracture of necessity.[6]

Galeazzi lesions are frequently underdiagnosed, and the true incidence may vary. Reports indicate an incidence of ≤3% of all forearm fractures in children and ≤7% of those in adults.[7] In adults, Galeazzi fractures are extremely unstable, and the results of nonsurgical treatment are uniformly unsatisfactory. A high risk of deformation following nonsurgical management has been linked to various deforming forces, including gravity, which acts through the weight of the hand and causes fracture displacement and subluxation of the DRUJ, as well as the deforming forces associated with the brachioradialis, pronator

quadratus, and thumb abductors and extensors.[8]Galeazzi fractures managed with closed modalities have been reported to yield up to 92% unsatisfactory clinical results.[6]Therefore open reduction and internal fixation is the standard of treatment for this fracture.[6]The aim of this study was to evaluate the demographic details and functional outcome of Galeazzi fracture dislocation managed with dynamic compression plate and DRUJ stabilization with one Kirschner wire inserted parallel to the wrist joint. Open reduction and internal fixation with stabilization of DRUJ is simple, cost effective and gold standard procedure for Galezzi fracture and as per the author's knowledge this will be the first study of its kind in mid-western part of Nepal.

METHODS

This descriptive observational study was conducted in the Department of Orthopedics at Nepalgunj Medical College Teaching Hospital Kohalpur, Banke, Nepal over the period of 36 months from April 2016 to March 2019. All adult patients aged above 18 who had closed or Gustilo and Anderson grade I open fracture without any pre-existing fracture around the wrist on the ipsilateral and without pre-existing arthrosis of the wrist and radiographically confirmed Galeazzi fracture (fracture of the middle or distal third of the radius with fracture at the base of the ulnar styloid, widening of the joint space of the DRUJ, angulation of the radius relative to the ulna on lateral radiographs, and more than 5 mm of shortening of the ulna) were included in the study. Patients who had distal radius fracture without radiographical DRUJ subluxation/dislocation, open fractures above grade I, pre-existing fracture around the wrist or arthrosis of the wrist, pathological fracture, pre-existing forearm fractures, fracture with associated ulna fracture and fractures old than 2 weeks were excluded from the study. All patients with suspected forearm fractures presenting to the emergency department were initially immobilized in above elbow Plaster of Paris slab, and after the general condition of the patient was stabilized, detailed history was taken to determine the demographic details, mode of injury, and clinical evaluation was done to determine the status of soft tissue, fracture pattern, and neurovascular status. Plain radiographs were taken in anteroposterior and lateral views. Patients were enrolled in the study after confirming diagnosis and considering inclusion and exclusion criteria. All the cases were approached via standard Henrys anterior approach, in all the patients radius shaft fracture was fixed first with 3.5 mm narrow dynamic compression plate (DCP) and lag screw (oblique fractures) and autologous iliac crest bone grafting was used in patients who had comminution and in all cases stability of the DRUJ was assessed at the operation and restored using one 2.0 mm percutaneous Kirschner wire inserted parallel to distal radioulnar joint. Wound was closed in layers followed by above elbow posterior slab in 90 degrees of flexion with forearm in supinaton after dressing was done. All the patients were administered intravenous antibiotics for at least of 48 hours and then converted to oral antibiotics. The dressing was changed after 48 hours of surgery and the patients were generally discharged from hospital after 48 hours and second look dressing was advised to the patient on 5th to 7th day. On 14th post-operative day sutures were removed and above elbow slab was continued till 6 weeks. Kirschner wire was removed at 6 weeks duration and range of movement exercises and physiotherapy were started after this period. Patients were observed at 6, 10, 16 and 24 weeks and 52 weeks both radiographically and clinically. At every follow up patients were observed for fracture union, range of movement, arthrosis, implant position and stability of the DRUJ. Union was defined as bridging of at least 3 out of 4 cortices on two radiograph views. Patients were given a questionnaire at the end of follow up to assess their functional disability. This was done using the disability of arm, shoulder and hand (DASH) score[9]and tabulated for analysis. In this study, the score result was divided into 4 categories as follows 75-100 indicated severe disability, 50-74 indicated poor, 25-49 showed fair and 0-25 showed good function.

RESULTS

1. Distribution of demographic profile in total patients (n=35)

There were 35 patients in the study. There were 24 (68.57%) males and 11(31.43) females.

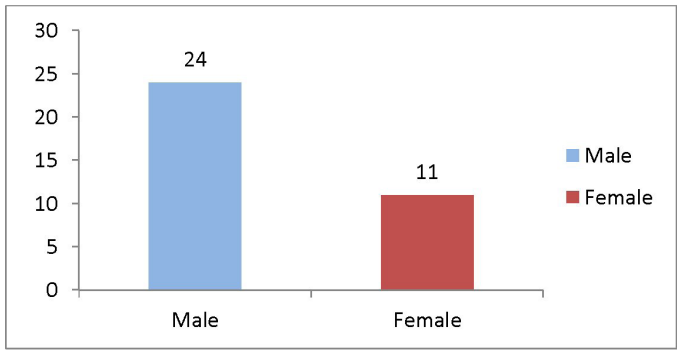

Figure 1 : Bar diagram showing gender ratio in total population

2. Distribution of age group in total patients (n=35)

In my study the patients were from 19 years to 49 years with mean age of 35.00±1.5 years.

Age group	Number	Percentage	Mean
18-30	9	25.7%	
31-40	22	62.9%	35.00±1.5
41 and above	4	11.4%	

Table I :

3. Distribution of patients according to Mode of Injury

The common modes of injury is as shown below which consisted of 18 patients (51.42%) with fall injury, 7 patients (20%) with direct blow, 6 patients (17.14%) with road traffic accident and 4 patients (11.42%) with sport injury.

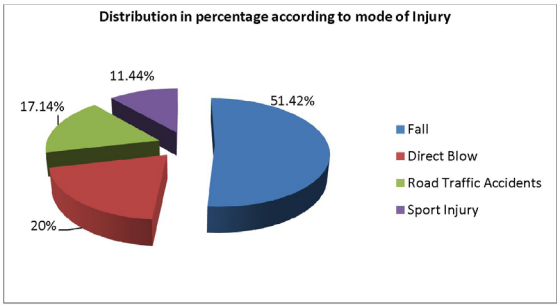

Figure 2 : Pie chart showing mode of injury in total patients

In this study 26 patients (74.28%) had involvement of right limb and 9 patients (25.71%) had involvement of left limb. The average duration from time of injury to surgery was 5 days and bone grafting was not needed in any of the cases.

The average time period for union was about 16 weeks and there were no patients with delayed union and nonunion. Malunion which was defined as angulations greater than 5 degrees in each plane were reported in 1 patient (2.86%)

4. Complications in the study

Complications	Number	Percentage (%)
Stiffness of wrist	4	11.42
Surgical site infection	2	5.71
Irritation of extensor tendon due to long screws	2	5.71
Malunion	1	2.86

Table II :

The ROM in this study is
Flexion 70 degrees
Extension 60 degrees
Ulnar deviation 30 degrees
Radial deviation 15 degrees

5. The DASH score at the final follow-up

In final follow-up on the basis of DASH score 24 patients (68.57%) had good results, 10 patients (28.57%) had fair results and 1 patient (2.86%) had poor result with no any severe results.

DASH score	Number	Percentage
Good	24	68.57%
Fair	10	28.57%
Poor	1	2.86%
Severe	0	0%
Total	**35**	**100%**

Table III :

DISCUSSION

Galeazzi fracture dislocation is highly unstable injury involving fracture of distal third/fourth of radius with dislocation of the distal radio ulnar joint.[10] The results of conservative treatment are poor. Anatomical reduction and internal fixation with plating with additional stabilization of DRUJ with K wire with or without immobilization in plaster in full supination is considered standard treatment in most of published literature. In the present study most of the patients were male (68.57%) which is similar to the study by Mikic[11] (74% males) and study by Moore et al.[12] (80% males). A male preponderance is common considering the higher risk of violent injury among men. Right limb is involved in most of the patients (74.28%) which is comparable to the study done by Riju KP [13] where 76.19 % patients had involvement of right side, most of the patients were in age group 31 to 40 which fits in accordance with most of the published literature. Fall injury accounts for the most of mode of injury (51.42 %) which is comparable to the study by by Riju KP [13] where 50 % patients had injury due to fall. The most common age group is 31- 40 (62.9%) of the patients which is comparable to most of established literature. In this present study 97.14 % of the patients had good to fair outcome which is comparable to the study done by Varma R et al [14] where 94 % of patients had good to fair outcome.

LIMITATIONS

The major limitation of this study are study design; sample size, outcome variables and duration of follow up. It is a descriptive; observational study with 35 patients; few variables; and follow up for 52 weeks. This study would have been more meaningful if it were a randomized controlled trial with large sample, more variables and longer duration of follow up.

CONCLUSION

Galeazzi fracture is an inherently unstable injury involving disruption of the DRUJ so ORIF with plating and stabilization of DRUJ is the gold standard method of treatment. It can be concluded from this study that this fractures are more common in young to middle aged males and in dominant limb and the most common mode of injury is fall injury in mid-western part of Nepal unlike other mode of injury in literature. Open reduction and internal fixation with plating and stabilization of DRUJ with K wire yields good to fair outcome on DASH score.

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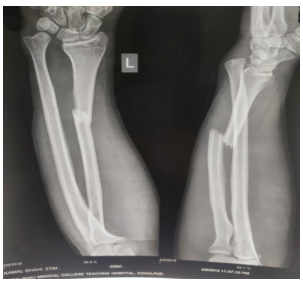
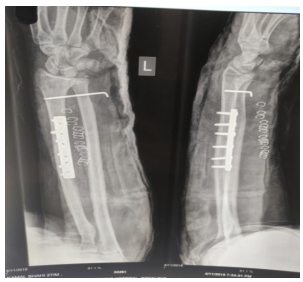
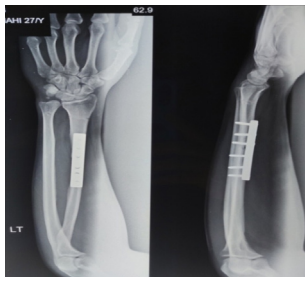
PHOTOS



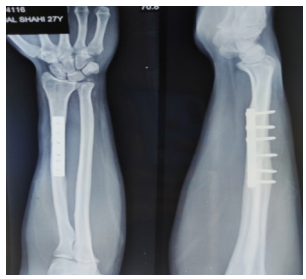
X-ray A/P and Lat of left forearm



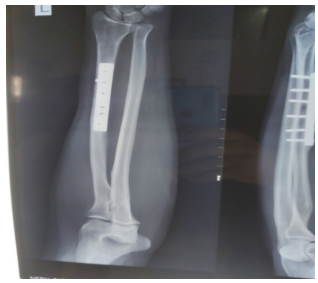
1st Post-operative X-ray



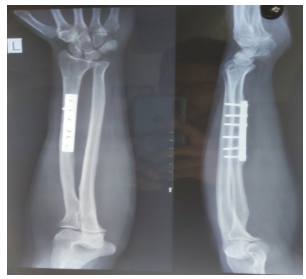
Follow up X-ray at 6 weeks



Follow up X-ray at 10 weeks



Follow up X-ray at 16 weeks



Follow up X-ray at 52 weeks

ORIGINAL ARTICLE

Hearing Loss in Low Birth Weight Neonates: A Comparative Study at Nepalgunj Medical College and Teaching Hospital

Sharma A[1], Saxena RK [1], Poudel DR[1], Shrestha K [1]

ABSTRACT

Introduction: Hearing impairment is the most common congenital abnormality that occurs in 1 to 4/1000 newborns. It has a profound effect on their optimal development of language, speech and cognitive skill. Early detection in order to achieve effective treatment is essential. An association between low birth weight and hearing loss is commonly associated with multiple risk factors that can alter hearing in a synergistic fashion. Universal neonatal hearing screening programs have become widely implemented aiming for the screening, confirmation of the diagnosis and intervention by 1, 3 and 6 months respectively. Transient Evoked Otoacoustic emissions is one of the test found to be a quick, objective, non-invasive, accurate and easy test for early detection of this problem. **Aim**: Early detection of hearing loss in neonates focusing on low birth weight for early optimum rehabilitation. **Methods**: A comparative case control study conducted in 100 neonates under 2 groups. 50 neonates with low birth weight and 50 with normal birth weight who were born at NGMCTH, Kohalpur. Their hearing evaluation was done with Transient Evoked Oto Acoustic Emission (TEOAE). **Results**: The total referral rate was 12 % and pass rate was 88 %. The referral rate in LBW group was 20 % and 4 % in normal weight neonates. The pass rate in low birth weight was 80 % and 96 % in normal weight babies. **Conclusion**: Hearing impairment is a severe consequence in neonates with low birth weight. To decrease the economic and social burden of effects of hearing loss, it is assumed that newborn screening can immeasurably improve the future of newborn with early rehabilitation.

***Keywords*: Hearing assessment, Low birth weight, Neonates, Transient Evoked otoacoustic emission**

Authors:

1. Dr. Anshu Sharma
2. Prof. R.K. Saxena
3. Prof. Dhundi Raj Paudel
4. Dr. Kumar Shrestha

[1]Department of Otorhinolaryngology, Nepalgunj Medical College and Teaching Hospital, Banke

Address for Correspondance:

Dr. Anshu Sharma
Department of Otorhinolaryngology
Nepalgunj Medical College and Teaching Hospital
Nepalgunj, Banke, Nepal
Phone: 9848031256
E-mail: anshusa.regmi@gmail.com

INTRODUCTION

Hearing fulfills a fundamental role in the acquisition, development and maintenance of speech and language abilities. The hearing loss in infants is often irreversible, not only affecting optimal development of speech and language, but also the cognitive, intellectual, cultural and social development of the child. The incidence of moderate to profound congenital hearing loss is estimated to range from 1 to 4/1000 live births and 5/100 for babies from neonatal intensive care units (NICU). [1]The Joint Committee on Infant Hearing (JCIH) has set a goal and recommended High Risk Registry (HRR) to identify neonates at higher risk for hearing loss. Low birth weight (LBW) is one of the important HRR factor. National Institute for deafness and other communicative disorder (NIDCD) recommended Universal neonatal hearing screening (UNHS) for infants within the first 3 months of life. Congenital sensory neural hearing loss (SNHL) ranges from 1 to 3 per 1000 live births. Hearing loss of 30 db or greater occurs in 3/1000 infants and bilateral severe to profound hearing loss occurs in 1/1000 live births. [2] According to the surveys conducted in different countries by WHO, around 0.5 to 5/1000 neonates and infants have congenital or early childhood onset of SNHL.[3] The number of people in the world who suffer from a disabling hearing loss has increased from 42 million to 360 million in 2010. [4] In Nepal the prevalence of deafness is about 16.6%. About 10% of them are unaware of their problem because of mild impairment and 7% of them are suffering with disabling impairment.[5] Birth weight is an indicator of biological maturity affecting the newborns health and subsequent progression. 2/3 children with LBW are premature.[6]The other causes of LBW are young ages, multiple pregnancies, previous LBW infants, poor

nutrition, smoking, medication, malnutrition, heart disease or hypertension, untreated coeliac diseases, drug addiction, alcohol abuse, and insufficient prenatal care and certain environmental risk factors. The prevalence of bilateral moderate to severe hearing loss in LBW (<2500gm) neonates is approximately 2-4%. The overall prevalence of unilateral and bilateral mild to severe hearing impairment in this high risk infant population is 10-100 times higher than neonates without risk factors.[7]

In Nepal the rate of newborn with LBW is 11.9%.[8] The LBW is an essential determinant of mortality, morbidity and disability. It has been possible to increase their survival but yet not their medical morbidity with the consequential auditory disability.

The physiological procedures for screening the neonates recommended by JCIH are OAE (Otoacoustic emission) and AABR (automated auditory brainstem response). OAE are low-intensity sounds that are generated by the cochlea. If there is damage to the outer hair cells then OAE are not evoked. The OAE have a reported sensitivity of 95%, with a negative predictive value of 99% for identifying infants hearing loss. With the availability of OAE as a screening tool, screening of neonates has become more efficient, reliable and effective.[9] OAE testing does have some limitations. It does not evaluate the inner hair cells (IHC), CN VIII, ascending central auditory pathway, or auditory processing function such as in auditory neuropathy spectrum disorder, so AABR is indicated.[10]

METHODS

This was a comparative case control study, conducted from February 2018 to January 2019 in total of 100 neonates, 50 neonates with LBW and 50 neonates with normal birth weight (NBW) from NICU and postnatal ward of Nepalgunj Medical College Teaching Hospital (NGMCTH), Kohalpur, Banke, Nepal.

After random sampling hospital admitted newborns of either sex, with both LBW (<2500gm) or NBW with normal external auditory canal and intact tympanic membrane were enrolled for the study.

Exclusion criteria were newborns whose parents were not giving consent, External auditory canal abnormalities, retracted or bulged tympanic membrane, and presence of vernix or debris which could not be removed, babies having URTI, significant congenital malformation, family history of congenital hearing loss. The study population comprised of two groups: LBW neonates and NBW neonates. 50 neonates were included in each group fulfilling above mentioned inclusion criteria.

On the 2nd or 3rdday after birth, informed written consent, detail history about newborn was taken. Otoscopic examination, along with TEOAE was performed by portable analyzer device from MAICO Diagnostic GmbH, Salzufer 13/14, and D-10587. The frequency band were 1.5 KHz, 2 KHz, 2.5 KHz, 3KHz, 3.5 KHz and 4 KHz and TEOAE stimulus intensity range was of 40 to 70 dB SPL and maximum SPL of 90 dB. The 'Pass-Fail' criteria were a SNR ≥ 6 dB SPL, in three out of six frequency bands. The results was shown as either 'Pass', 'Refer' or 'Pass' in one ear and refer in another ear. In case of doubtful result, repeat tests were done up to a three times in order to reduce false positive results. Those who obtained 'Pass' were considered to have a hearing loss no more than 35dB and those who obtained 'Refer' were referred to another center for AABR.

STATISTICAL ANALYSIS:

Chi Square test was used for analysis. 'p' value of <0.05 considered significant.

RESULTS

A total of 100 neonates underwent TEOAE test, out of which 56 were male and 44 were female. In LBW group, 25 (50%) were male and 25 (50%) were female. In normal group, 31 (62%) were male and 19 (38%) were female.

Study group	>2500 (gm)	1500 – 2499 (gm)	<1499 (gm)	Total
LBW	0	43	7	50
NBW	50	0	0	50
Total	**50**	**43**	**7**	**100**

Table I : Frequency of weight distribution among the study group

Study group	<37 (weeks)	≥37 (weeks)	Total
LBW	43	7	50
NBW	17	33	50
Total	**60**	**40**	**100**

Table II : Frequency of gestational age among the study group

Study group	Mean (weight) gm	Mean (gestational age) week
LBW	1945.86	34.178
NBW	2741.08	37.206
TOTAL	**2343.47**	**35.692**

Table III : Mean weight and gestational age among the study group

Study group	Refer	Pass	Total	P value
LBW	10 (20%) (8 B/L, 2 U/L)	40 (80%)	50 (100%)	0.014
Normal	2 (4%) (U/L)	48 (96%)	50 (100%)	
Total	**12 (12%)**	**88 (88%)**	**100 (100%)**	

***Table IV :** TEOAE among the study group*

In TEOAE 80% of neonates with LBW fell into PASS group and 20% of them into REFER group. Among the normal weight neonates, 96% fell into PASS group and only 4% into REFER group. The p value was 0.014 which was statistically significant.

DISCUSSION

Hearing loss is referred as an epidemic of developing countries because of its high prevalence. Failure to intervene

in time renders a severe threat to critical quality of life. Early identification and intervention can prevent severe psychosocial, educational and linguistic and cognitive development. Now early identification is defined as diagnosis as early as 3 months with intervention by 6 months of age.[6] Although survival of high risk neonates is getting emphasis in national health policy of Nepal, their hearing screening is neglected.

This study was done to screen and compare the hearing impairment among the LBW and NBW neonates using TEOAE. In this study the referral rate was found to be 20% in LBW group and 4% in NBW group. This result was found to be similar to the study done by Korres SG et al[1] in 2007 and Roth et al[11] in 2006. However this study was found to be in contrast to the study done by Van Dommelen et al[12] in 2015, where the referral rate was higher. This might be because, we used TEOAE only and they used AABR. If OAE was used in combination with AABR then the referral rate might have decreased. Differences in pass rates reported in the literature are influenced by several factors. Preterm infants tend to suffer from noisy breathing and/or middle ear effusion or dysfunction, resulting in a high failure rate and requiring further or repeated examinations. Furthermore, TEOAE testing of NICU infants who were still on monitors was difficult. According to our protocol, TEOAE screening took place on 2ndor 3rd days after the birth and we usually didn't take much of neonates having nasogastric tubes. This may have contributed to the higher pass rates in our study. The present study confirms the great accuracy of neonatal screening for congenital hearing loss by means of TEOAE analysis, despite the fact that the possibility of false negative (hearing neuropathy) must always be considered. American Academy of Pediatrics have reported a prevalence of sensory neural hearing defects from 4.4-7.1 up to 50 times greater in premature infants in NICU.[13] In this study, hearing loss was significantly associated with LBW, though the detailed data of results are not shown in this article, other factors were also associated with hearing loss. Those factors were low Apgar score, hyperbilirubinemia, ototoxic medications and prolonged mechanical ventilation.

LBW has been consistently identified as one of the high risk criteria for congenital hearing loss. In our study, statistical comparison between this group and controls showed significant differences in all TEOAE measures, indicating a degree of cochlear malfunctioning in LBW neonates.

CONCLUSION

This study shows that the newborn with LBW shows statistically significant positive co-relation with hearing loss. By preventing the causes of LBW for example like prematurity, malnutrition and others, by means of proper prenatal care, congenital hearing loss can be prevented. Joint efforts with maternal and child care programs should be launched.

It was concluded that the newborn hearing screening program could be implemented in hospital based programs as a part of standard medical care to provide early hearing rehabilitation and preventing disability.

LIMITATION

The limitation of this study was unavailability of AABR in our institution, which could have detected auditory neuropathy spectrum disorder.

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A Prospective Study Comparing Continuous Versus Interrupted Suture Techniques in Midline Abdominal Wound Closure

Bharti SV[1], Sharma A[1]

ABSTRACT

Introduction: Wound closure after midline laparotomy is an essential part of surgery to produce a healthy and a strong scar. There is an alternative interrupted method of closure as compared to conventional continuous method of closure. Many comparative studies have shown different outcomes. So, we wanted to evaluate the outcome of different techniques in our setting. **Aim:** To compare the outcome of Interrupted abdominal closure and continuous abdominal closure in midline laparotomy wound. **Methods:** This was a prospective comparative study conducted in the Department of Surgery of Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke, Nepal for a duration of 1 year. A total of 60 patients were selected randomly to receive either continuous or interrupted abdominal closure in midline laparotomy wound. Wound was evaluated in terms of wound discharge, infection and wound dehiscence. **Results:** The mean age of the patients was 38.38 years. Most commonly, the patients presented with duodenal ulcer perforation with peritonitis. The average time taken for abdomen closure in group A (16.77 minutes) was significantly less as compared to group B (27.77 minutes). The average cost of sutures for group B (Rs 1322.97) was higher than that of sutures for group A (Rs 1118) with p value of <0.01. Wound infection and incidence of burst abdomen were similar in both groups after one month, suture sinus was seen in three patients of group A and four patients of group B (p = 1.0). Incisional hernia was seen in one patient of group A and in none of the patients of group B at three month's follow-up (p = 1.0). **Conclusion**: Continuous technique of midline laparotomy wound closure is better in terms of time required for wound closure and costing of suture materials, while showing no difference in terms of wound infection, burst abdomen and late wound complications.

Keywords: **Abdominal closure, Continuous technique, Interrupted technique, Midline laparotomy**

Authors:

1. Dr. Shiv Vansh Bharti
2. Dr. Anup Sharma

[1] Department of Surgery, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

Address for Correspondence:

Dr. Shiv Vansh Bharti
Department of Surgery
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: shivbharti2984@gmail.com

INTRODUCTION

Midline laparotomy incision provides adequate exposure to all four quadrants, allows rapid exposure with minimal blood loss and is simple, so it is the most prevalent technique to open the abdomen in both emergency and elective settings.[1] However, it's drawbacks are comparatively increased incidence of postoperative wound dehiscence and incisional hernia as compared to other incisions.[2, 3, 4]

The elite technique of wound closure would be the one that approximates the tissue in such a way that normal healing mechanisms can occur under optimal circumstances. The technique should provide adequate tensile strength to the incision until the wound is healed and remains secure even in the presence of local or systemic infection, and should be the one in which suture material is well tolerated on a short and long-term basis. The technique should be able to be done with expediency.[3]Different methods for closure of laparotomy wounds have been used in the past. The abdomen closure has been done in terms of continuous versus interrupted closure, single layer versus mass closure and absorbable versus non absorbable sutures.[4] The selection of material for closing the abdominal fascia should be made with the knowledge of what is known about fascial healing and the physical properties of suture material (strength, durability, ease of handling, and resistance to infection).[5] The advantage of continuous suturing technique is that it provides equally distributed tension across the suture line and is more expedient, but its disadvantage is that it has a single suture holding the fascia together. The interrupted suturing technique has been used with success in the past, but its drawback is that it is tedious and there is a need of isolating tension to each individual stitch.[3]

Studies carried out in the past have shown non uniform results regarding the risk of burst abdomen between continuous

and interrupted methods.[6,7,8] The selection of technique for abdominal closure may not be very important in elective laparotomies with adequate nutritional status and with no other risk factors for burst abdomen, but in a developing country like Nepal, many patients in emergency conditions present with malnutrition and prolonged intraperitoneal sepsis which are the risk factors for burst abdomen. Hence, it is important for us to determine the optimal technique for abdominal closure in our group of such patients.[7]

METHODS

This prospective comparative study was conducted in Department of Surgery, Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke, Nepal for a duration of 1 year from July 2018 to June 2019. A total of 60 cases (30 cases in each group) undergoing emergency laparotomy were included.

Ethicon's prolene (polypropylene) number 1 round body was used in all patients. The method of abdomen closure for each case was determined by the next sequence number from a randomization chart and the patients were divided into two groups. Group A consisted of patients whose wound was closed by continuous closure technique and Group B, whose wound was closed using interrupted abdominal closure technique.

The abdomen was closed in a single layer using Polypropylene number 1 in both groups. In Group A suture was placed at least 1.5 cm away from the fascial edge and a distance of 1 cm was kept in between each suture. A strand of suture was started at the end of the incision placing the knots underneath the fascia, and then the sutures were run towards each other and tied in the middle of the incision.[3] In Group B, suture was placed at least 1.5 cm away from the fascial edge and a distance of 1 cm was kept in between each suture. Here, Smead-Jones far-far, near-near technique was used.[3] In both the techniques, sutures were tied such that the fascial edges well approximated but not crushed together.[3] The length of the wound, number of suture packs used and time consumed (in minutes) for closure were recorded intra-operatively. Wound was evaluated for erythema, swelling, serous discharge, infection, separation of edges and wound dehiscence postoperatively. If wound discharge was present, it was sent for culture and sensitivity. Early wound complications like serous discharge, partial wound dehiscence (dehiscence of skin and subcutaneous tissue with intact musculoaponeurotic layer), wound infection and burst abdomen were observed until the patients were discharged. Patients were called in for follow-up after one month and after three months of discharge to look for late wound complications like suture sinus formation and incisional hernia. The data so collected was analyzed using IBM SPSS (Statistical Package for the Social Studies) version 21. Student's T test, Chi-square test and Fisher's exact test were applied for statistical significance with p value of <0.05.

RESULTS

The age of the patients ranged from two years to 72 years with mean age of 38.38 years (SD ±18.97). In group A the youngest patient was aged two years and the oldest was 72 years, with a mean age of 36.23 years (SD ±20.88). Group B had a three years old patient as the youngest and 68 years old patient as the oldest with mean age of 40.53 years (SD ±16.92). The most common age group was 40-50 years with 11 patients (18.3%) and the least common was >70 years with two patients (0.03%).

Both groups were comparable in terms of age distribution (p = 0.385).

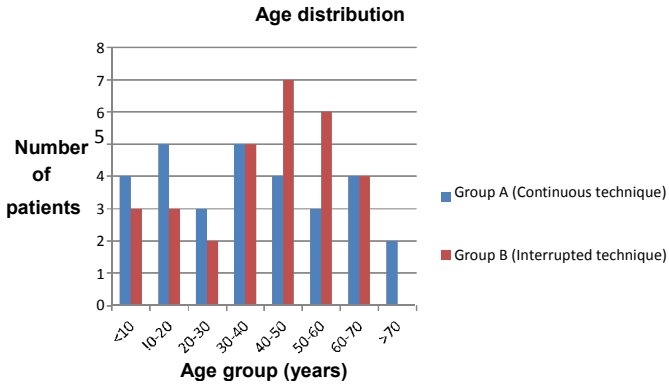

Figure 1: Age distribution (years)

Most commonly, patients presented with hollow viscus perforation with peritonitis. Out of 60 patients, 26 patients (43.33%) had duodenal ulcer perforation, six patients (10%) had appendicular perforation, six patients (10%) had traumatic small bowel perforation, four patients(6.66%) had sigmoid volvulus, four (6.66%) had small bowel volvulus and four (6.66%) patients had adhesive bowel obstruction.

The time taken for abdomen closure using continuous technique (16.77 min) showed statistically significant difference over interrupted technique (27.77 min) with p value of <0.01.

Group	N	Mean time taken for abdomen closure	Std. Deviation
Group A (Continuous technique)	30	16.77 min	±2.096
Group B (Interrupted technique)	30	27.77 min	±3.773

Table I : Time taken for wound closure (minutes)

The average cost of sutures for group B (interrupted technique) was NRs 1322.97. Its cost was significantly higher than that of sutures for group A (continuous technique) whose average cost was NRs 1118 with p value of <0.01.

There were no early wound complications in 15 (50%) patients of group B and 17 (56.6%) patients of group A.

In group A, five (16.7%) patients had serous discharge while six (20%) patients in group B had serous discharge (p = 0.739).

In group A, five (16.7%) patients had partial wound dehiscence (superficial skin and subcutaneous tissue dehiscence with intact musculoaponeurotic layer) while seven (23.3%) patients had partial wound dehiscence in group B (p = 0.519).

In group A, three (10%) patients had burst abdomen while two (6.7%) patients in group B had burst abdomen (p = 1.0).

Wound Complication	Abdomen Closed With		Total
	Continuous Technique Group A	Interrupted Technique Group B	
Serous Discharge	5	6	11
Partial Wound Dehiscence	5	7	12
Burst Abdomen	3	2	5
No Complication	17	15	32
Total	**30**	**30**	**60**

Table II : Early wound complications

Five (16.7%) patients of group A had wound infection and six (20%) patients of group B had infected wound with p value of 0.739. At one month follow up, suture sinus was seen in three (10%) patients of group A and four (13.3%) patients of group B (p=1.0). At three month's follow up, suture sinus was seen in one (3.3%) patient of Group A and two (6.7%) patients of group B (p=1.0). Incisional hernia was seen in only one (3.3%) patient in group A (p = 1.0).

Wound at One Month	Abdomen Closed With		Total
	Continuous Technique Group A	Interrupted Technique Group B	
Suture Sinus	3	4	7
No Wound Complication	27	26	53
Total	**30**	**30**	**60**

Table III : Wound complications at one month

Wound at Three Months	Abdomen Closed With		Total
	Continuous Technique Group A	Interrupted Technique Group B	
Suture Sinus	1	2	3
Incisional Hernia	1	0	1
No Wound Complication	28	28	56
Total	**30**	**30**	**60**

Table IV : Wound complications at three months

DISCUSSION

Wound closure after midline laparotomy is an essential part of surgery to produce a healthy and a strong scar. In the present study, the time taken for abdominal wound closure was significantly less with the use of continuous technique (16.77 min) as compared to interrupted technique (27.77 min). Study by Richards et al. showed similar result in which they randomized 571 patients and found out that the abdominal wounds could be closed by continuous suture in approximately half the time required for placing interrupted sutures (20 vs. 40 minutes).[3]

The cost of suture Ethicon's Prolene (polypropylene) no.1 round body used in this study is Rs 559 per suture. In this study, the cost of continuous abdominal closure (group A) was cheap compared to interrupted abdominal closure (group B). Almost single extra suture was required in interrupted abdominal closure for longer incisions. Since the abdomen was closed with continuous technique using two prolene sutures, which were started at both ends of the incision and then tied in the middle, the cost of the continuous suturing was the cost of two sutures. On the other hand, interrupted closure technique required two to three sutures for abdominal closure. Other studies by Fagniez et al[9] Gislason et al[10] and Dhamnaskar et al.[11] concluded that continuous closure was preferable to interrupted closure in midline abdominal closure because it was more economic and expedient. Early wound complications were present in nearly half of patient population. However, the incidence of wound infection was statistically insignificant between the groups. While Karwasara et al. in their study, found out that interrupted closure group had more wound infection compared to continuous technique (28% vs. 16%).[4]

Hodgson et al[12] Shashikala et al[13] and Peponis et al[14] showed that wound infections were not statistically different between the two methods of abdomen closure. Incidence of wound infection rate was considerably high in our study than in other studies. It may be because our study was done exclusively in emergency cases and were of type IV wounds.

Worldwide incidence of wound dehiscence after midline laparotomy ranges from 0.9% to 36.7%.[3,4,6,14,15] Burst abdomen was present in 8.33% of the patients in this study. Burst abdomen was seen in 10% of group A patients and 6.67% of group B patients.

There are studies for example by Akmal et al. showing better results with abdominal closure in continuous fashion.[6] Other proponents mention interrupted closure technique to be better as far as wound dehiscence is considered.[7] Similarly, Peponis et al. found out that wound dehiscence in interrupted suturing vs. continuous suturing was 2.7% vs. 2.4% respectively (p = 1.0).[14] As far as late wound complications are concerned, there is no uniform agreement as to which technique is better.

Hodgson et al. in their study concluded that abdominal fascial closure with a continuous non absorbable suture had a significantly lower rate of incisional hernia.[12] While, Gupta et al. in their study, found out that the incisional hernias occur with the same frequency with both the interrupted technique of laparotomy wound closure and the continuous technique.[16]

LIMITATIONS

There are few limitations to this study. The sample size is small. Incidence of incisional hernia could not be studied properly in our study as the study of incidence of incisional hernia requires longer duration of follow-up, but the patients do not come for longer follow-up. The wound complications are higher in our study because only emergency cases were taken, hence this result cannot be considered for elective cases.

CONCLUSION

Continuous technique of midline laparotomy wound closure is better in terms of time required for closure and costing of suture material, while showing no difference in terms of wound infection, burst abdomen and late wound complications.

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Study of Correlation Between Glycated Hemoglobin (Hba1c) and Serum Lipid Profile in Type 2 Diabetic Patients

Shrestha A

ABSTRACT

Introduction: Diabetic mellitus is a chronic metabolic disease characterized by hyperglycemia. Type 2 diabetes mellitus accounts for more than 90% of cases worldwide. Elevated HbA1c and dyslipidemia proportionately increases the risk of development of cardiovascular disease (CVD) which is the major cause of morbidity and mortality worldwide. **Aim** : To Study the correlation between glycated hemoglobin (HbA1c) and serum lipid profile in type 2 diabetic patients. **Methods**: This is a hospital based cross sectional study conducted at Nepalgunj medical college teaching hospital, which included 104 type 2 diabetic patients (54 males and 50 females).Venous blood samples were collected from all patients and serum was used for analyzing HbA1c, lipid profile panel and fasting blood glucose (FBG). DM was defined as per American diabetic association (ADA) criteria. Dyslipidemia was defined as per the National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP) III Guidelines. The data were analyzed using standard statistical methods, including SPSS 21. **Results** : Abnormal lipid parameters were demonstrated with increased Total Chloseterol (TC), Triglyceride (TG), Low density lipoprotein (LDL),Very low density lipoprotein (VLDL) and low High density lipoprotein (HDL) suggestive of dyslipidemia.HbA1c showed direct and significant correlation with TC,LDL,TG and VLDL. Patients with HbA1c > 7.0% had a significantly higher value of TC, LDL, TG and VLDL as compared to patients with HbA1c ≤7.0%.However, the significant difference in value of HDL-C was not found between two groups. **Conclusion**: Due to the strong correlation with lipid profile, HbA1c could be the ideal marker for predicting dyslipidemia in type 2 DM . Patients with higher HbA1c value and dyslipidemia should be considered as a very high risk group for CVD.

Keywords: **Dyslipidemia, HbA1c, Type 2 Diabetes mellitus**

Author:

Dr. Anil Shrestha

Address for Correspondence:

Dr. Anil Shrestha
Department of Internal Medicine
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke , Nepal
Email: shtani4@gmail.com

INTRODUCTION

Diabetes Mellitus (DM) refers to a group of common metabolic disorder that share the phenotype of hyperglycemia. The factors contributing to hyperglycemia are reduced insulin secretion, decreased glucose utilization and increased glucose production. [1] DM causes about 5% of all deaths globally each year. The chronic hyperglycemia of DM is associated with long term dysfunction and failure of various organs like kidney, nerves, eye, heart and blood vessels. 50% of people with diabetes die of cardiovascular disease.[2,3] With an increasing incidence worldwide, DM will be leading cause of morbidity and mortality for the forseable future.

Type 2 diabetic patients may have several forms of dyslipidemia, most common pattern being hypertriglyceridemia and reduced HDL cholesterol levels which greatly increase the risk of cardiovascular disease (CVD) compared with people without DM. An early investigations to correct dyslipidemia has shown to reduce cardiovascular events and morbidity in individual with DM.[4,5]

Measurement of glycated hemoglobin (HbA1c) is the standard method for assuring long term glycemic control and it reflects the glycemic history of previous 2-3 months.[1] Classical risk factors as well as elevated HbA1c has now been regarded as an important risk factor for CVD in individuals with or without diabetes. CVD risk increases by 18% for each 1% increase in absolute HbA1c value in diabetic population[6] where as reduction of HbA1c by 0.2% reduces cardiovascular mortality by 10%.[7] Even within normal range of HbA1c, positive relationship between HbA1c and CVD has been demonstrated in non diabetic cases.[8] The aim of this study was to find out the relationship between HbA1c and serum lipid profile in type 2 DM in Nepalese population.

METHODS

This is a Hospital based cross sectional study conducted at Nepalgunj Medical College Teaching Hospital , Kohalpur,Nepal, Department of Internal Medicine from December 2019 to June 2020.Total of 104 type 2 diabetic patients (54 males and

50 females) attending Medicine OPD and admitted at medicine wards were included in the study. The study was approved by Institutional Review Committee (IRC) and informed consent was obtained from all patients. Cases were enrolled into the study after meeting inclusion and exclusion criteria.

Inclusion criteria : Age ≥30yrs
Both male and female patients
Known case of type 2 DM under medication or newly diagnosed type 2 DM

Exclusion criteria : known case of type 1 DM
Hypothyroidism, chronic renal failure
Patients already on lipid lowering drugs

Venous blood samples were collected from all patients after at least 8 hours fasting. The serum was used for analyzing fasting blood glucose (FBG), Lipid profile panel –TC,TG,HDL-C by using fully automated biochemistry analyzer,Mindray BS380/ BS230(Germany) and indirect LDL-C was calculated using Fridewald's formula . HbA1c was estimated by using automatic BIORAD D10 (USA). DM was defined as per ADA criteria . NCEP ATP Panel III guideline was referred for serum lipid reference level. Hypercholesterolemia is defined as TC >200mg/dl, high LDL-C when value >100mg/dl, Hypertriglyceridemia as TG>150mg/dl and Low HDL-C when value <40mg/dl.[1] Dyslipidemia was defined by presence of one or more than one abnormal serum lipid concentration. The data were analyzed using standard statistical methods including SPSS 21. Quantitative data were expressed as mean and standard deviation (SD). Statistical tool used was student's t-test. P value less than 0.05 was considerd to be statistically significant.

RESULTS

A total of 104 type 2 diabetic patients were enrolled in the study ,54 were males and 50 were females.The mean age of male and female patients were 56.26 ±11.24 and 54.34±10.79 respectively. Although mean value of lipid profile, HbA1c and FBG were slightly higher in females than males , these differences were statistically non significant (Table I).

Parameter	Male (n=54) Mean±SD	Female (n=50) Mean±SD	P Value
Age (Years)	56.26±11.24	54.34±10.79	
TC	181.99±32.79	187.12±25	0.374
TG	174.07±50.39	181.06±101.22	0.653
LDL	103.89±25.03	107.66±20.99	0.409
HDL	43.20±6.69	45.31±8.96	0.176
VLDL	34.80±10.08	35.92±20.09	0.717
FBS	149.48±40.75	153.29±41.90	0.639
HbA1c	9.05±2.45	9.34±2.73	0.579

Table I : Age and Biochemical parameters of male and female type 2diabetic patients

Hypercholesterolemia was found in 39 patients (37.5%), increased LDL-C in 58(55.8%) patients, hypertriglyceredemia and increased VLDL-C in 62(59.6%) patients and decreased HDL-C 19(18.3%) patients as shown in table II.

	TC	LDL	TG	VLDL	HDL
Male	17 (43.6%)	28 (48.3%)	37 (59.7%)	37 (59.7%)	12 (63.2%)
Female	22 (56.4%)	30 (51.7%)	25 (40.3%)	25 (40.3%)	7 (36.8%)
Total	**39 (37.5%)**	**58 (55.8%)**	**62 (59.6%)**	**62 (59.6%)**	**19 (18.3%)**

Table II : Abnormal lipids parameters in type 2 diabetic patients

According to glycemic status, patients were classified into two groups. HbA1c ≤ 7.0% was considered first group and HbA1c >7.0% was considered second group. Patients with HbA1c > 7% had statistically significant higher value of TC (P = < 0.001), TG (P = 0.028), LDL-C (P = <0.001), VLDL(P = 0.021), FBG(P= < 0.001) as compared to the patients with HbA1c ≤ 7.0% where as HDL-C showed negative correlation with HbA1c though it was statistically non significant (table III).

Parameter	Glycated Haemoglobin (HbA1c)		P Value
	≤7% (n=35)	**>7% (n=69)**	
	Mean±SD	Mean±SD	
TC	168.62±36.45	192.50±20.98	<0.001*
TG	153.71±47.88	189.45±88.31	0.028*
LDL	92.59±26.72	112.35±17.92	<0.001*
HDL	45.57±9.26	43.53±7.07	0.213
VLDL	30.39±8.95	37.84±17.65	0.021*
FBS	118.14±18.42	168.14±39.26	<0.001*

Table III : Biochemical parameters categorized by glycemic control (HbA1c)

DISCUSSION

The present study evaluated the pattern of lipid profile parameters in type 2 diabetic patients and its correlation with HbA1c. This study shows high prevalence of hypertriglyceredemia, high LDL- C, hypercholesterolemia and low HDL-C levels in type 2 diabetic patients. These are well known risk factors of cardiovascular diseases. Insulin affects liver appolipoprotein production. It regulates the enzymatic activity of lipoprotein lipase (LPL) and cholesterol ester transport protein. All these factor are likely cause of dyslipidemia in DM.[9] In this study, most significant disorder in lipid profile was hypertriglyceredemia. Similar finding was shown by Regmi P et a[10] and Mahato RV et al.[11]

This study shows highly significant correlation between HbA1c and FBG which is similar to studies done by Ito c et al[12] , ko GT et al[13] and Rosediani et al.[14] This study also found significant correlation between HbA1c and TC, LDL- C as reported by Er ciyas F et al[15], Anderson GE et al[16], Ohta T et al[17] in their studies.

The diabetes complications and control trial (DCCT) considered HbA1c as the gold standard of glycemic control. The target HbA1c value for reducing cardiovascular complication was

≤7.0% . In this study, we classified diabetic patients in 2 groups as per the HbA1c cut off of 7.0%. Th patients with HbA1C value >7.0% showed significant increase in TC, LDL –C, TG and VLDL without any significant change in HDL-C in comparision to patients with HbA1c ≤7.0%. Khan HA et al[18] showed the impact of glycemic control on various lipid parameters. Though there was no signifant differences in LDL-C with regard to glycemic control , alterations in other lipid parameters were statistically significant. Thus, this study suggests that severity of dyslipidemia increases with higher HbA1c value and diabetic patients with increased HbA1c and dyslipidemia should be considered as very high risk group for cardiovascular disease (CVD). Therefore, we should focus on improving glycemic control which can essentially reduce the risk of cardiovascular events in diabetics.[19] It has been considered that reduction in HbA1c level by 0.2% could lower the cardiovascular mortality by 10%.[7]

LIMITATION

Though menopausal status affects the lipid profile, it was not considered in this study. Non diabetic controls would provide better comparison of lipid profile which should be added in future studies. In addition to this, sample size also might have been inadequate for drawing the definite conclusion.

CONCLUSION

This study shows that type 2 DM has significant relation with dyslipidemia. Along with blood glucose , frequent monitoring of lipid profile is equally important for the best care of type 2 diabetic patients and to decrease the risk of cardiovascular events. HbA1C is the gold standard tool for the assessment of glycemic control and it could be the ideal marker for identifying dyslipidemia in type 2 DM.

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ORIGINAL ARTICLE

Risk Factors and Outcomes of Low Birth Weight Neonates Admitted In a Tertiary Care Center

Adhikari J[1], KC R[1], Kharel S[2]

ABSTRACT

Introduction: Birth weight <2500 grams, <1500 grams and <1000 grams irrespective of gestational age is low birth weight, very low birth weight and extremely low birth weight respectively. Low birth weight is associated with high morbidity and mortality. **Aim:** To find out the possible maternal risk factors associated with low birth weight babies, morbidities and mortalities seen in them during their hospital stay. **Methods:** Hospital based cross sectional observational study was performed in 200 newborns <2500 grams in Nepalgunj Medical College, Kohalpur, Banke, Nepal. **Results:** Out of 200 neonates 8 (4%), 40 (20%) and 152 (76%) were extremely low birth weight, very low birth weight and low birth weight respectively with Male:Female ratio of 1.12:1. Most common maternal risk factors for low birth weight was Illiterate mothers (88%) followed by preterm delivery (68%). Inadequate antenatal visit was associated with low birth weight (P<0.05). Most common morbidity seen in low birth weight was neonatal sepsis (96%) followed by neonatal jaundice (87%). 44 (22.0%) neonates expired and 156 (78.0%) survived. Neonatal sepsis was most common (36.4%) cause of mortality followed by respiratory distress syndrome (22.7%). **Conclusion:** Certain measures could be taken to prevent low birth weight deliveries: discouraging delivery at teenage, adequate antenatal visits, avoiding smoking and alcohol during pregnancy. Well trained staffs and better facilities in neonatal intensive care unit could improve the survival and minimize the morbidities in low birth neonates.

Keywords: **Low birth weight, Morbidity, Mortality, Neonates, Risk factors**

Authors:

1. Dr. Jyoti Adhikari
2. Dr. Rajesh K.C.
3. Dr. Shristi Kharel

[1] Department of Pediatrics, Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke

[2] Department of Pediatrics

Address for Correspondence:

Dr. Jyoti Adhikari
Department of Pediatrics
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: adhikarijyoti@yahoo.com

INTRODUCTION

Neonatal period is defined as the first 28 days of life.[1] Birth weight is a major determinant of morbidity, mortality and disability in neonates and children. Low birth weight (LBW) is associated with high morbidity, mortality and lifelong consequences.[2] LBW has been defined by the World Health Organization (WHO) as birth weight less than 2500 gm irrespective of gestational age.[3] Subcategories include Very Low Birth Weight (VLBW) and Extremely Low Birth Weight (ELBW) in which birth weight is less than 1500 grams and 1000 grams respectively.[4] Worldwide, about 16.0% of live births are LBW. Over 90.0% of these are born in developing countries. Asia is the region with the highest incidence (19.7%), almost 3 times that of Europe (6.5%) or USA (7.0%).[5] In Nepal, the LBW rate is relatively high, ranging from 14-32%, as documented from various hospital and community based studies. LBW babies in Nepal was reported at 17.8 % according to the World Bank collection of development indicators in 2011.[6]

LBW is caused by prematurity, intra-uterine growth retardation (IUGR) or both. Poor nutritional status, maternal illness like tuberculosis, anemia, bad obstetric history, poor weight gain, toxemia/pre-eclampsia, placental bleeding, short inter pregnancy interval and multiple pregnancy are other contributing factors. Smoking, alcohol, physically demanding work during pregnancy, lack of the health care facilities, inadequate prenatal care and iatrogenic prematurity/IUGR add to the risk of LBW.[7]

Birth weight is an indicator of greater influence on infant health and survival. Epidemiological data show that an infant born with a low weight is at higher risk of dying as compared to those with normal weight. The association between mortality and birth weight is inversely proportional that is, the probability of death decreases as the weight increases.[8] A better understanding of

maternal antenatal factors contributing to LBW births and need for improvement in perinatal care is necessary to prevent LBW.

METHODS

A hospital based cross sectional study was carried out among 200 newborns with birth weight <2.5 kg admitted to neonatal intensive care unit (NICU) from labor room and obstetric ward of Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke, Nepal over the period of one year from May 2018 to April 2019. Newborns whose mothers were willing to participate and delivered in NGMCTH were included in the study whereas those mothers not willing to participate delivered outside NGMCTH, neonates with congenital anomalies and with birth weight ≥2.5 kg were excluded from the study.

Every mother was interviewed personally in Nepalese language. General information of mother and newborn was taken in detail and documented. Details of neonates in terms of sex, presenting complains were recorded. Maternal details such as age, educational level, parity, behavioral history (smoking, alcohol) and medical history was noted. Detailed obstetric history in terms of ANC visit, period of gestation, PV leaking/ bleeding, hypertension during pregnancy was taken.

All data were processed and analyzed by using Statistical Package for Social Science (SPSS) software version 20. Variables were expressed in the form of frequencies and percentages. Descriptive statistics such as mean, range, standard deviation were computed. Chi-square test and Fisher's exact test were used to analyze relationship between maternal risk factors and outcomes of cases. The study was aimed to find out possible maternal risk factors associated with LBW babies, morbidities and mortalities seen in them during their hospital stay.

RESULTS

Out of 200 neonates included in the study, 8 were ELBW (4%), 40 were VLBW (20%) and remaining 152 (76%) were LBW**.** 106 (53%) newborn were males and 94 (47%) were females giving M: F ratio of 1.12:1. Duration of hospital stay ranged from 1-16 days with mean duration of 6.81 ±3.80 days.

Maternal Risk Factors	Frequency (n)	Percentage (%)
Illiterate Mothers	176	88.0
Preterm delivery	136	68.0
Inadequate ANC visits	118	59.0
Teenage pregnancy	104	52.0
PROM for >12 hrs	64	32.0
Smoking & Alcohol Intake	12	6.0
Pre-eclampsia & Eclampsia	6	3.0
Past h/o LBW/Preterm birth	2	1.0
Gestational Hypertension (GHTN)	2	1.0

Table I : Percentage maternal risk factors for LBW neonates n=200)

There were various maternal risk factors for LBW neonates among which the most common was Illiterate mothers (88%) followed by preterm delivery (68%), inadequate ANC visits (59%) and teenage pregnancy (52%).

Maternal Age (Years)	Frequency (n)	Percentage (%)
≤19	54	27.0
20 – 25	104	52.0
25 – 30	24	12.0
30 – 35	12	6.0
35 – 40	6	3.0
Total	**200**	**100.0**

Table II : Percentage of maternal age distribution in LBW neonates (n=200)

In the present study minimum age of mother was 16 years while maximum age was 39 years. Mean age being 23.51 years.

ANC Visits	Birth Weight				Total		P-Value
	<1.5 Kg		≥1.5 Kg				
	N	%	N	%	N	%	
Adequate	8	4.0	68	34.0	76	38.0	<0.01
Inadequate	40	20.0	84	42.0	124	62.0	
Total	**48**	**24.0**	**152**	**76.0**	**200**	**100.0**	

Table III : Association between ANC visits and LBW

Association between maternal ANC visits with low birth weight newborns was statistically significant (P-value <0.05). Out of 48 (24.0%) VLBW newborns, mothers of 40 (20.0%) and that of 84 (42.0%) LBW newborns had inadequate ANC visits.

Morbidities	Frequency (n)	Percentage (%)
NNS (Neonatal Sepsis)	192	96.0
NNJ (Neonatal Jaundice)	174	87.0
Hypoglycemia	82	41.0
Apnea	34	17.0
Hypothermia	30	15.0
Birth Asphyxia	26	13.0
RDS (Respiratory Distress Syndrome)	24	12.0
Seizures	12	6.0
Pulmonary Hemorrhage	6	3.0
Anemia	6	3.0
Others (ARF=2,Hypocalcaemia=2,MAS=2,OralCandidiasis=4&NEC=2)	12	6.0

Table IV : Percentage of morbidities in LBW Neonates (n=200)

In the present study, most common morbidity (96%) was neonatal sepsis, followed by neonatal jaundice (87%).

Birth Weight	Neonatal Outcomes				Total		P-Value
	Death		Survival				
	N	%	N	%	N	%	
<1.5 Kg	24	12.0	24	12.0	48	4.0	<0.01
≥1.5 Kg	20	10.0	132	66.0	152	76.0	
Total	**44**	**22.0**	**156**	**78.0**	**200**	**100**	

Table V: Association between birth weight and neonatal outcomes

Above table shows 44 (22.0%) neonates expired and 156 (78.0%) survived. Out of expired newborns, 24 (12.0%) were VLBW and 20 (10.0%) were LBW. This association was statistically significant (P Value <0.05) as shown in table V.

Cause of Death	Frequency (n)	Percentage (%)
Birth asphyxia	2	4.5
Prematurity	8	18.2
Pulmonary hemorrhage	8	18.2
RDS	10	22.7
Septicemia	16	36.4
Total	**44**	**100.0**

Table VI. Percentage of Causes of Mortality in LBW Neonates (n=200)

156 newborns out of 200 survived and were discharged from the hospital and 44 of them expired. Neonatal sepsis was most common (36.4%) cause of mortality followed by Respiratory Distress Syndrome (RDS) (22.7%), pulmonary hemorrhage (18.2%) and prematurity (18.2%). 4.5% died of birth asphyxia as shown in table VI.

DISCUSSION

Birth weight is an indicator of greater influence on infant health and survival. Survival of LBW babies is dependent on gestational age, birth weight and disease severity. NICU based incidence of LBW in the hospital was 28.10%, that of very low birth weight and extremely low birth weight babies were 10.25% and 5.16% respectively which is comparable to other studies.[13,14,15]

53% of neonates were males and 47% females which is comparable to the study done by Manikyamba D et al where males were 54.28% and females 45.71%.[14] In other study done by Kayastha S et al males and females were 52.0% and 48.0% respectively[5]. Males were predominant in the current study as male babies are given extra care, attention and preferential hospitalization in many parts of our country.

In the present study, 43% of the neonates stayed in hospital for 6-10 days followed by 2-5 days in 37%. Mean duration of stay was 6.81±3.79 days which is comparable to other study.[18] This is known fact that LBW newborns are physiologically immature and very prone to complications and need extra care. All this extra facility and care always increases hospital stay of LBW newborn.

The maternal age in our study ranged from 16-39 years. Minimum age of mother was 16 years while maximum was 39 years with mean of 23.51 years. LBW was most common (52%) in mothers with age group 20-25 years followed by ≤19 years (27%) and 3% were above 35 years. This might be consequence of aging in elderly women due to decline hormonal activities, which may occur after the age of 34 years and biological immaturity in case of mothers below 20 years of age.

59% of mothers had inadequate ANC visits whereas 38% had adequate visits which is comparable to other studies.[9,10,11] High number of inadequate ANC visits in the present study could be because of unavailability of easy access to proper health facilities in this part of the country. Most common complication in LBW neonates was neonatal sepsis (96%) followed by neonatal jaundice (87%), hypoglycemia (41%), apnea (17%), hypothermia (15%), birth asphyxia (13%), respiratory distress syndrome (12%), seizures (6%), pulmonary hemorrhage (3%), anemia (3%) and others (6%) which included ARF-1%, hypocalcaemia-1%, MAS-1%, oral candidiasis-2% and NEC-1%. In study done by Budhathoki S et al complications seen in LBW neonates were clinical sepsis (64.6%), non-physiological jaundice (61.9%), hypoglycaemia (15.2%), apnoea (14.6%), perinatal asphyxia (12.7%), hypocalcaemia (12.3%), culture proven sepsis (11.6%), hypoxic ischemic encephalopathy (8.9%), hyaline membrane disease (3.3%), meconium aspiration syndrome (3.0%), necrotizing enterocolitis (3.0%), polycythemia (2.6%).[19] Common morbidities seen in LBW babies in various studies were neonatal sepsis, hyperbilirubinemia, Respiratory Distress Syndrome, MAS which can be explained by the fact that LBW newborns are very prone to these complications because of the immaturity of organs. In the study group of 200 neonates, 48 were VLBW and 152 were LBW. 12.0% of VLBW and 10.0% of LBW expired which is comparable to other studies.[16,17] The results showed LBW is a risk for neonatal survival. Neonatal septicemia was most common (36.4%) cause of mortality followed by Respiratory Distress Syndrome (RDS) (22.7%), pulmonary hemorrhage (18.2%) and prematurity (18.2%). 4.5% died of birth asphyxia. In a study by Ballot DE et al causes of mortality was extreme multiorgan immaturity (40%), HMD (15.7%), asphyxia (12.1%), NEC (10%), nosocomial sepsis (10%), septicemia (2.1%), congenital infection (1.4%), IVH (2.1%), congenital abnormality (2.8%), pulmonary hemorrhage (1.4%).[20] In another study by Bhatnagar PK common causes of mortality were asphyxia neonatorum (40.18%), neonatal jaundice (39.26%), neonatal infections (15.88%), gastroenteritis (4.68%).[12] Similarly in a study by Poudel P et al major causes of death were HMD (51.0%) and sepsis (34.7%).[13]

LIMITATION

Small sample size, single center study, unable to randomize the samples are some of limitations of this study.

CONCLUSION

In this study data like gender, birth weight, maternal risk factors, causes of morbidity and outcomes were recorded and analyzed among newborns. Inadequate ANC visit significantly increased the delivery of LBW babies. Neonatal sepsis was the most common morbidity as well as the cause of mortality in LBW babies. Total mortality was 22% which was higher in the newborns who were <1500 gms (12%) in comparison to weight >1500 gms (10%).

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ORIGINAL ARTICLE

Chest X-Ray in Coronavirus Disease 2019 (COVID-19) Infection: Findings and Correlation with Clinical Outcome at Level-3 Nepalgunj Medical College and Teaching Hospital Kohalpur

BK S[1], Pandey S[2], Poudel N[3], Pandit S[1], Sah A[4], Neupane H[5]

ABSTRACT

Introduction: At the end of 2019 a novel virus, named SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2), expanded globally from China. A new coronavirus, severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), was identified as the cause of this outbreak of viral pneumonia that causes coronavirus disease 2019 (COVID-19). **Aim**: The aim of this study is to find out the chest radiological features of corona virus disease patients and correlate them with clinical outcome. **Methods**: This is a Hospital based study involving patients with clinical-epidemiological aspect of all reverse transcription polymerase chain reaction (RT-PCR) corona virus disease (COVID-19) positive patients, who performed Chest X-Rays at the emergency department of Nepalgunj Medical College, Teaching Hospital from March to June, 2020. All patients performed reverse transcription polymerase chain reaction from nasopharyngeal and throat swab, Chest X-Ray at the Emergency Department and clinical-epidemiological data. **Results**: Patients with a reverse transcription polymerase chain reaction positive results for corona virus disease infection were 32 out of these, 22 were females (68.75%) and 10 males (31.25%), with a mean age of 40.78 years (range 20–74 years). Only 2 Chest X-Rays were negative for radiological thoracic involvement (6.25%). The following alterations were more commonly observed among 30 patients: 18 patients with lung consolidations (56.25%), 19 (59.37%) with Ground Glass Opacities, 7 (21.87%) with nodules and 21 (65.6%) with reticular–nodular opacities. Patients with consolidations and Ground Glass Opacities coexisting in the same radiography were 34.37% of total. In reverse transcription polymerase chain reaction positive patients, we found also signs nonspecific for corona virus disease pneumonia as hilar or vascular congestion (37.5%), cardiomegaly (28.12%), pleural effusion (15.6%) and pneumothorax (3.12%). Peripheral (56.25%) and lower zone distribution (56.25%) were the most common predominance. Bilateral involvement (68.75%) was most frequent than unilateral one. Given the results, baseline Chest X-Rays sensitivity in our experience is about 65.62%.**Conclusion**: In this study, COVID-19 CXRs generally manifested a spectrum of pure ground glass, mixed ground glass opacities to consolidation in bilateral peripheral middle and lower lung zones. BSTI CXR reporting classification of COVID-19 is valid and sensitive in our patients with addition of middle zonal involvement in classical COVID-19 criteria as opposed to just lower zone involvement.

Keywords: **British Society of thoracic Imaging classification (BSTI), Chest radiography, Coronavirus, COVID-19, Diagnostic imaging, Infection**

Authors:

1. Dr. Shyam Kumar B.K
2. Dr. Sumit Pandey
3. Dr. Nabin Poudel
4. Dr. Sandesh Pandit
5. Dr. Alok Kumar Sah
6. Mr. Hitesh Neupane

[1] Department of Medicine, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke
[2] Department of Dermatology, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke
[3] Department of Radiology, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke
[4] Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke
[5] Kalashi Memorial Hospital Pvt. Ltd., Salyan

Address for Correspondence:

Dr. Shyam Kumar B.K.
Department of Medicine
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: dr.shyamyp@gmail.com

INTRODUCTION

At the end of 2019 a novel virus, named SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2), expanded globally from China with the first Italian cases dating back to February 2020.[1] A new coronavirus, severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), was identified as the cause of this outbreak of viral pneumonia that causes coronavirus disease 2019 (COVID-19). On 24 January, Nepal officially announced its first confirmed COVID-19 in a 32-year old male patient, who had recently returned from Wuhan city, China.[2] Radiological evaluation is one way of looking in the body.[3] This new coronavirus causes a highly infectious disease, commonly called Coronavirus Disease 19 (COVID-19): Lung infection can result in severe pneumonia up to more aggressive acute respiratory distress syndrome (ARDS).[4] Radiological evaluation of patients with clinical–epidemiological suspect of COVID-19 is mandatory, especially in the emergency department (ED) while waiting for RT-PCR results, in order to have a rapid evaluation of thoracic involvement. The recent COVID-19 radiological literature focuses primarily on computed tomography (CT) findings, which is more sensitive and specific than chest X-ray (CXR): In particular, in China CT is used as a first-line diagnostic method for COVID-19. [5, 6.] The pulmonary syndrome was later named coronavirus disease 2019 (COVID-19) by the World Health Organization. Despite the imposition of strict quarantine rules and travel restrictions, the virus transmitted rapidly out of China with a number of confirmed cases reported in Europe, the United Kingdom, and the United States.[7] The clinical features of the initial patients confirmed to be infected with SARS-CoV-2 included lower respiratory tract illness with fever, dry cough, and dyspnoea, a manifestation similar to those of two other diseases caused by coronavirus, severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS).[8] In our experience, the imaging features of COVID-19 pneumonia are diverse, ranging from normal

appearance to diffuse changes in the lungs. In addition, different radiological patterns are observed at different times throughout the disease course. Because the time between onset of symptoms and the development of acute respiratory distress syndrome (ARDS) was as short as 9 days among the initial patients with COVID-19 pneumonia, early recognition of the disease is essential for the management of these patients.[9] Radiographic features including consolidation, ground-glass opacities (GGO), pulmonary nodules and reticular–nodular opacities were diagnosed according to the Fleischer Society glossary of terms. [10]

To further our understanding of the radiographic features of COVID-19, our study aims to describe the appearances of COVID-19 at chest radiography, correlate the appearances on chest radiographic images with RT-PCR, compare findings at chest radiography findings and describe the time course of chest radiography appearances relative to symptom onset. The aim of this study was to find out the various radiological findings on CXR in a COVID-19 patients with positive PCR and to correlate with their clinical outcome.

METHODS

CXRs of patients with clinical–epidemiological suspicious of COVID-19 infection presented to Nepalgunj Medical College, Teaching Hospital Kohalpur from March to June, 2020 were reviewed. Approval from the Institutional Review Committee, Nepalgunj Medical College, Kohalpur was obtained before starting the study. Inclusion criteria were: patients' age between 18 and 90 years, RT-PCR positive patients. All patients without RT-PCR negative or negative RT-PCR were excluded, patients below 18 years were excluded. Clinical features like fever, cough, dyspnoea, respiratory impairment, diarrhea, asthenia, myalgia and dysgeusia were noted. RT-PCR results were considered the reference standard. Chest X-rays findings were noted RT-PCR done with nasopharyngeal throat swab. All CXRs were acquired as digital radiographs with the same portable X-ray unit (Simadzu - Fujiflm, Italia) in the isolation wards of our ED. CXRs were performed in the postero-anterior or antero-posterior projection performed by two thoracic radiologists in order to define the number of radiological suspects of COVID-19 infection. Radiographic features including consolidation, ground-glass opacities (GGO), pulmonary nodules and reticular–nodular opacities were diagnosed according to the Fleischer Society glossary of terms. [11] CXRs were also assessed for the presence of a specific distribution of the disease (mostly peripheral or perihilar predominance), monolateral (right or left lung) or bilateral disease, upper or lower or diffuse predominance. Portable CXR findings were classified according to British Society of Thoracic Imaging classification and documented in frequencies and percentages.

Statistical analysis

Statistical analysis was performed with SPSS 19. Mean age of the cohort with age range was calculated. Portable CXR findings were classified according to BSTI classification and documented in frequencies and percentages.

RESULTS

We found 32 patients fulfilling the following selecting criteria: presence of clinical–epidemiological suspect of COVID-19 infection and RT-PCR and CXR performed at the ED admission. Patients with a RT-PCR-positive results for COVID-19 infection were 32 of these, 22 were females (68.75%) and 10 males (31.25%), with a mean age of 40.78 years (range 20–74 years). Only 2 CXRs were negative for radiological thoracic involvement (6.25%). The others showed variable features as described in table I. The following alterations were more commonly observed: 18 patients with lung consolidations

(56.25%), 19 (59.37%) with GGO, 7 (21.87%) with nodules and 21 (65.6%) with reticular–nodular opacities. Patients with consolidations and GGO coexistent in the same radiography were 34.37% of total. In RT-PCR-positive patients, we found also signs nonspecific for COVID-19 pneumonia as hilar or vascular congestion (37.5%), cardiomegaly (28.12%), pleural effusion (15.6%) and pneumothorax (3.12%). Peripheral (56.25%) and lower zone distribution (56.25%) were the most common predominance. Bilateral involvement (68.75%) was most frequent than unilateral one. Given the results, baseline CXR sensitivity in our experience is about 65.62%.

In our population the most affected patients were in the age group of 20–70 years old. Patients older than 70 years (6.25%) often presented more advanced lung involvement. In this study 3 patients (9.3%) were immediately discharged from ED, 20 patients were hospitalized in medicine department and 4 in ICU (Figure 1). A total of 5 (15.62%) patients died in the 30 days

COVID-19 Radiographic Features	Number (%)
Normal Baseline CXR	2 (6.25)
Abnormal Baseline CXR	30 (93.75)
Reticular Nodular Opacities	21 (65.62)
Ground Glass Opacities	19 (59.37)
Consolidation	18 (56.25)
Vascular Congestion Sign	12 (37.5)
Cardiomegaly	9 (28.12)
Nodules	7 (21.87)
Pleural Effusion	5 (15.6)
Pneumothorax	1 (3.12)
Distribution:	
Peripheral Predominance	18 (56.25)
Perihiler Predominance	6 (18.75)
Diffuse	13 (40.62)
Basal Predominance	18 (56.25)
Superior Predominance	10 (31.25)
Right Lung	19 (59.37)
Left Lung	14 (43.75)
Bilateral Lung	22 (68.75)

Table I : Radiographic Findings of COVID-19 patients

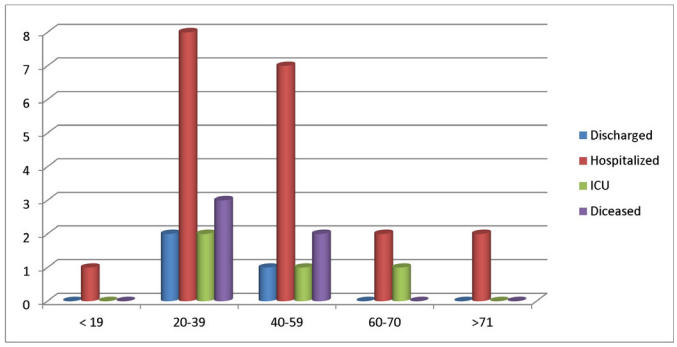

Figure 1 : Age distribution and outcomes of patients with positive RT-PCR

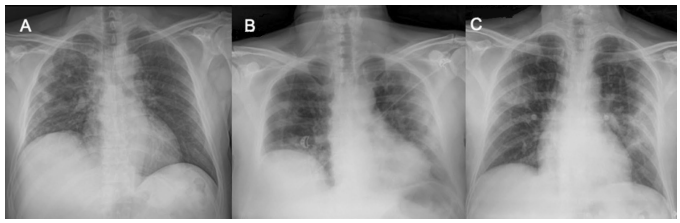

Figure 2 : Peripheral consolidation in COVID-19 pneumonia. Images in A, B and C show three cases of male patients with subpleural consolidations and bilateral involvement

DISCUSSION

In global pandemic situation, the radiological approach should be aimed at a rapid classification of the patient with suspected COVID-19 infection. In our study patients with a RT-PCR-positive results for COVID-19 infection were 32.Out of these, 22 were females (68.75%) and 10 Males (31.25%), with a mean age of 40.78 years (range 20–74 years). The others showed variable features as described in table I.

In our population the most affected patients were in the age group of 20–70 years old. Patients older than 70 years (6.25%) often presented more advanced lung involvement Figure 1. In a study conducted by Diletta Cozzi et al 153 (65.4%) were males and 81 (34.6%) were females, with a mean age of 66.04 years (range 18–97 years). The most affected patients were in the age group of 60–79 years old (43.6%, of which 71.57% males); patients older than 80 years (23.1%) often presented more advanced lung involvement.[12] In our study Only 2 CXRs were negative for radiological thoracic involvement (6.25%). The others showed variable features as described in table I. The following alterations were more commonly observed: 18 patients with lung consolidations (56.25%), 19 (59.37%) with GGO, 7 (21.87%) with nodules and 21 (65.6%) with reticular–nodular opacities. In HY Yoon et al study, 8 (33%) patients had abnormal initial radiographic findings in contrast to 93% abnormal chest findings. In Wong HYF et al study consolidation was found in 47% of cases and this finding is consistent with other studies.[13, 14] In a study conducted by Cozzi D et al, the following alterations were more commonly observed: 135 patients with lung consolidations (57.7%), 147 (62.8%) with

GGO, 55 (23.5%) with nodules and 156 (66.6%) with reticular–nodular opacities.[12]

Ho Yuen Frank et al At baseline chest radiography, consolidation was the most common finding (30 of 64; 47%), followed by ground-glass opacities (21 of 64; 33%). Peripheral distribution (26 of 64; 41%) and lower zone distribution (32 of 64; 50%) were the more common locations, and most had bilateral involvement (32 of 64; 50%). Pleural effusion was found in two patients (3%). [15]

In this study 2 in group of nine patients (4%) were immediately discharged from ED, and the others were hospitalized in medicine department or ICU (Figure 2). A total of 5 (15.62%) patients died in the 30 days (included 2 in group 2 and 3 in group 3). Toussie et al reported, a total of 145/338 (43%) patients were admitted. Of these, 28 (19%) were intubated, 89 (61%) developed sepsis, 29 (20%) had a prolonged stay, and 10 (7%) expired. At the time of writing, 5 (3%) were still intubated in ICUs.[16] In the first cohort of 41 patients with COVID-19 pneumonia from Wuhan, China, 13 patients (31.7%) were admitted to an intensive care unit (ICU) and 6 (14.6%) died . When the cohort size expanded to 99 cases, 11 patients (11.1%) worsened in a short period of time and died of multiple organ failure.[17, 18]

LIMITATION

Low sample size is limiting factor in our study. For better characterization and validation need large sample size and multicenter study. Another limiting factor is CT chest not done for our patient, which is more superior for correlating disease activity in COVID-19 patients.

CONCLUSION

COVID-19 pneumonia generally manifested a spectrum of pure ground glass, mixed ground glass opacities to consolidation in bilateral peripheral lower lung zones in our local population. BSTI chest reporting classification COVID-19 is valid in our patients with addition of middle zonal involvement in classical COVID-19 criteria as opposed to just lower zone involvement. Poor the x- ray chest poorer the outcome. BSTI can be used in emergency department to assist the x-ray chest of covid-19 patients for initial analysis. It can also help to make treatment plan weather patients have to admit in general COVID ward or ICU for betterment. Given the results, baseline CXR sensitivity in our experience is about 65.62%.

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ORIGINAL ARTICLE

Comparative Study of Autologous Radiocephalic and Brachiocephalic Arteriovenous Fistula in Patients with End Stage Renal Disease

Magar DT[1], Shrestha K[1], Chapagain D[1], Shrestha K[1], Thapa S[2]

ABSTRACT

Introduction: End-stage renal disease requires treatment with dialysis or renal transplantation. For the dialysis, autologous radiocephalic (RC) or brachiocephalic (BC) arteriovenous fistula (AVF) is the better option for vascular access for hemodialysis. **Aim**: The aim of this study is to find out the outcome between RC AVF and BC AVF. **Methods**: This is the retrospective study, conducted for the period of 24 months from September 2017 to September 2019 in the department of Cardiothoracic and Vascular Surgery of Bir Hospital, Nepal. RC and BC AVF were created for the assess of hemodialysis. Outcome and different complications were taken into consideration. **Results**: The total number of patients included in this study was 400. The overall failure rate of autologous AV fistula was 12.75%. Out of these, the failure rate was more in RC AV fistula group, 34 (17%) than in BC AV fistula group, 17 (8.5%). The most common complication was bleeding in both groups having an overall rate of 39 (9.75%). The limb edema was more common in BC AV fistula group 16 (8.0%) then in RC AV fistula group 7(3.5%). The overall infection rate was 4.5%. Overall patency rate was 87.25%.**Conclusions**: Autologous RC AVF and BC AVF are the choices for vascular access for hemodialysis in patients with end-stage renal disease. BC AVF has a better patency rate than RC AVF but with the slight higher risk of complications.

***Keywords*: Arteriovenous fistula, Brachiocephalic, Endstage renal disease, Hemodialysis, Patency, Radiocephalic**

Authors:

1. Dr. Deepak Thapa Magar
2. Dr. Kiran Shrestha
3. Dr. Dinesh Chapagain
4. Dr. Kumar Shrestha
5. Dr. Sara Thapa

[1]Cardiothoracis and Vascular Surgery unit, Department of Surgery, NAMS, Bir hospital

[2]Chitwan Medical College, Chitwan

Address for Correspondence:

Dr. Deepak Thapa Magar
Chief Consultant Surgeon, CTVS unit,
Department of surgery
NAMS, Bir Hospital
E-mail: deepakthapamagar@gmail.com

INTRODUCTION

End-stage renal disease (ESRD) is a major public health problem, requiring treatment with dialysis or renal transplantation .The incidence of which is increasing every year worldwide. For the approximately 640,000 patients in the United States with end-stage renal disease (ESRD), the majority (64.2%) undergo renal replacement therapy via hemodialysis. Less frequently used renal replacement therapy treatments are renal transplant (29.3%) and peritoneal dialysis (6.4%). [1]The methods of delivering hemodialysis include tunneled and non-tunneled catheters, arteriovenous grafts (AVGs), and arteriovenous fistulas (AVFs). Central venous hemodialysis catheters, although often necessary, should be avoided whenever possible. Because, among the hemodialysis delivery options, they have the highest rates of thrombosis, infection and central vein stenosis[2], especially when inserted from a subclavian vein. Blood flow rates from hemodialysis catheters are typically the lowest of all hemodialysis access types. Finally, hemodialysis catheters are associated with greater mortality than AVGs or AVFs.[3]

Arteriovenous fistula has been the vascular access of choice for hemodialysis because of lower cost, morbidity and mortality.[4] The three principal forms of chronic vascular access for hemodialysis are native arteriovenous fistulas (native AVFs), arteriovenous shunts using graft material (AV graft), and tunneled double-lumen catheters. Of these, the native arteriovenous fistula is preferred for long-term hemodialysis vascular access since it has the best long-term primary patency rate, requires the fewest interventions of any type of access, and most importantly, arteriovenous fistulas are associated with the lowest incidence of morbidity and mortality.[5] There are three main types of AVFs. The radiocephalic fistula is a

forearm fistula created by anastomosing the side of a radial artery to the end of a cephalic vein, also referred to as the Brescia-Cimino fistula. The brachiocephalic fistula is an upper arm fistula created by connecting the side of a brachial artery to the end of a cephalic vein at the level of the elbow. Finally, the brachial artery–to–transposed basilic vein (BTB) fistula which is created by anastomosing the side of a brachial artery to the end of a basilic vein that has been transposed laterally and elevated superficially to make it amenable to dialysis cannulation. We have conducted the study with the aim to compare the overall outcomes and complications of radiocephalic and brachiocephalic AVF for hemodialysis in end stage renal disease. The objectives of this study were to compare the outcome and rate of complications in radiocephalic & brachiocephalic arteriovenous fistula (AVF).

METHODS

This is the hospital based retrospective study, carried out over the period of 2 years from Sept 2017 to Sept 2019 in CTVS, department of surgery Bir Hospital, Nepal.

Total of 400 patients with ESRD requiring HD who were referred to the CTVS department for access were recruited. Vascular assessment was done by Allen's test, evaluation for venous thrombosis and venous size was performed clinically by palpation, when not appreciable with the help of Doppler studies. In all fistulas autologous veins were used. The radio cephalic fistulas were created using radial artery and cephalic vein end to side anastomosis in a non-dominant hand. When the radial artery and the cephalic veins were not suitable because of small diameter or previously operated, brachiocephalic AVF were created using brachial artery and cephalic vein end to side anastomosis. We excluded patients who had thrombosed cephalic veins, patients with uremic symptoms and with negative Allen's test.

Procedure Details

After evaluating the patients, all the needed investigations were performed. In the Operation Theater (OT), patients were positioned in supine. Incision site, usually the wrist of a non -dominant hand, was infiltrated with Injection Xylocaine 2%. Then slightly curvilinear incision was given. First cephalic vein was identified and dissected until the adequate length was obtained, then vein ligated and divided distally. Diluted Heparin was infiltrated to flush the vessels. Radial artery was identified, isolated. End to side anastomosis done with continuous Polypropylene 6.0 round body. Similar steps were taken creating the brachiocephalic arteriovenous fistula at elbow. Thrill assessed after the anastomosis, hemostasis secured and wound was closed. After the procedure antibiotic and analgesic were prescribed. Patients were advised to exercise the operated hand with a solid foam-rubber ball the size of a tennis ball (fistula ball) and discharged after the surgery.

Patients were advised to follow up in CTVS OPD after one week and then after 6 weeks to assess the maturation of the fistula. Similarly, patients were evaluated for complications like infection, hematoma, thrombosis, aneurysms and steal syndrome,

Data collection

Total of 400 cases, 200 in each group of radio cephalic and brachiocephalic fistula were taken for the studies. Approval from Subject Committee and Institutional Review Board of National Academy of Medical Sciences was taken prior to study. Data were collected from the surgery registers.

RESULTS

The age of the patient ranges from 15 to 81 years, with the mean age 56 ± 16.12 years. Male dominant 263 (65.75%), female 137 (34.25%). Both RC fistula and BC fistula created in 200 patients. The age group of the patients mostly diagnosed with ESRD was more than 56 years of age. (Table I)

Variables	RC AV fistula (200)	BC AV fistula (200)
Age		
15 – 25	4 (2.0%)	7 (3.5%)
26 - 35	27 (13.5%)	18 (9.0%)
36 - 45	35 (17.5%)	27 (13.5%)
46 – 55	37 (18.5%)	48 (24.0%)
56 – 65	53 (26.5%)	49 (24.5%)
>66	44 (22.0%)	51 (25.5%)
Sex		
Male	152 (76.0%)	111 (55.5%)
Female	48 (24.0%)	89 (44.5%)

Table I : Age Distribution according to Type of Fistula & Gender

Out of 400 patients 87 (21.75%) had Diabetes mellitus, having similar numbers in both RC group (22.0%) and BC group (21.5%). But there was a huge difference in number in case of re surgery in two groups. In RC group re surgery was done in 39 (19.5%) cases while in BC group re surgery was done in 73(36.5%) cases due to failure of previously created AV fistula. The overall percentage patients who were not on dialysis at the time creating the AV fistula was just 7.5 %.(Table II)

Variables	RC AV fistula n=200	BC AV fistula n=200	Total n=400
Diabetes Mellitus	44 (22.0%)	43 (21.5%)	87 (21.75%)
Re - surgery	39 (19.5%)	73 (36.5%)	112 (28.0%)
Not on dialysis	21 (10.5%)	9 (4.5%)	30 (7.5%)

Table II : Comparison of comorbidities and re surgery

The overall failure rate of autologous AV fistula was 12.75%. Out of these the failure rate was more in RC AV fistula group, 34 (17%) than in BC AV fistula group, 17 (8.5%). The most common complication was bleeding in both groups having an overall rate of 39 (9.75%). The limb edema was more common in BC AV fistula group 16 (8.0%) then in RC AV fistula group, 7(3.5%).The overall infection rate was 4.5%.

Variables	RC AV fistula n=200	BC AV fistula n=200	Total n=400
Edema	7 (3.5%)	16 (8.0%)	23 (5.75%)
Bleeding	21 (10.5%)	18 (9.0%)	39 (9.75%)
Infection	6 (3.0%)	12 (6.0%)	18 (4.5%)
Failure	34 (17.0%)	17 (8.5%)	51 (12.75%)

Table 3 : Complication & failure of AV Fistula

DISCUSSION

A progressive rise in the number of patients accepted for renal replacement therapy has been reported worldwide, permanent vascular access is the life-line for the majority of these patients, when hemodialysis is the treatment of choice. Thus, the successful creation of functional permanent vascular access is vital in order to deliver adequate hemodialysis therapy in ESRD.[6] The AVF is also important for the outcome of a patient on HD as it has a significant impact on survival.[7]

The distal radiocephalic AVF described in 1966 by Brescia et al [8] is considered the first procedure of choice followed by other potential options. However, when the distal veins are unavailable, exhausted, or had calcified distal vessels are in need for alternative methods for surgical angioaccess.[9] Autologous brachial artery fistulas are considered as a suitable option in these conditions.[10] So, we have compared the two most commonly created autologous arteriovenous fistula.

In our study the age of the patient ranges from 15 to 81 years, with the mean age 56 ± 16.12 years. In the article by Lamicchane et al[11], the median age was 35.44 years which was 20 years younger than our patients. But in the study of Ahmed et al [12], patient's age varied from 25 to 76 years with the mean age of 55 ± 20 years, which was similar to our study.

For the maturation of the fistula at least one and a half months is needed so that an autologous fistula can be used. The fistula should, therefore, preferably be created several months in advance of the anticipated need for dialysis. Most guidelines recommend a fistula should be placed at least 6 months before the anticipated start of HD treatments.[13] But in our study only the 30 (7.5%) patients created AV fistula before starting hemodialysis. It is very low compared to other studies. As much as 370 (92%) patients were referred for creation of AV fistula after starting hemodialysis. This percentage is higher than that reported from Australia (28%). [14]This might be due to delay in diagnosis, delay in seeking medical advice due to lack of awareness of the patients, delay in referral to surgeons for the creation of the surgery. Internal jugular assay, subcutaneous permanent catheter and even the creation of AV fistula do not last long. After sometimes these assays do no longer work. Internal jugular assay works for about one and a half month, subcutaneous catheter work for about six months and AV fistula may work for a few years. So we have to create the AV fistula in different sites, once the already created fistula no longer works. In our study, re surgery was done in 39 (19.5%) of RC groups while in BC group re surgery was done in 73 (36.5%) cases due to failure of previously created AV fistula. But in other studies most stenosis AV fistula are treated with percutaneous transluminal angioplasty (PTA), which facility is lacking in our center. In the study of Bountourious, only 9% of the stenosis required surgical revision and only in 13% re surgery was done for the fistulas which failed permanently.[15]Not all created AV fistulas are mature enough for the dialysis. Many factors like the site of the surgery, the size of the artery, vein, flow rate, comorbidities play the role for the maturation.[16] In our study, there was a failure rate of 17% in RC AV fistula group and 8.5% in BC AV fistula group with overall failure rate of 12.75%. In the study of Pogula et al the failure rate was in 18% RC AV fistula and 12.3% in BC AV fistula, with an overall failure rate of 15.15% which is similar to our study. Though AV fistulas are cheap and easy to construct, have excellent patency rates and require minimal maintenance by the patient and the health care staff, they can develop various complications. Most of them threaten the functionality of the fistula and some of them even pose an immediate ital. risk. It is important that all healthcare professionals who deal with patients on whom an AVF is performed should have through knowledge of the types, physiology, risks and treatment of these complications. The complications can be divided into acute and chronic, but since the follow up our patients were two months, we mainly discuss early complications. Bleeding is the most common acute complication. Spontaneous bleedings are not uncommon in uremic patients, in whom the primary mechanisms of hemostasis are compromised, including thrombocytopenia, platelet dysfunction and von Willebrand factor's changes. Bleeding sources have several causes. There are smaller sources, with no significant hemodynamic impact. These smaller sources are dermal, sub dermal or from the subcutaneous tissue. There are also larger sources, with a higher flow and a life threatening potential. They are usually found at the site of the anastomosis or a slipped vessel ligature and are accompanied by a hematoma. In the study of Susan et al the rate of thrombosis and bleeding was 8.5% .[17]This finding was similar to our study which was also the most common complication. There was no difference in the rate of bleeding between RC AVF and BC AVF. In RC AV fistula group

the bleeding rate was 10.5% and in BC AV fistula 9% with overall bleeding of 9.75%. Hand edema is a relatively frequent, but usually transient complication in vascular access surgery. Venous hypertension occurs shortly after AVF creation, but it diminishes after collaterals develop and outflow improves. Outflow obstruction due to stenosis of a central vein provoked by a long term indwelling catheter or by neo intimal hyperplasia from the turbulent flow of the AVF also causes venous hypertension. If the hypertension does not subside, it is accompanied by the classic symptoms of a venous stasis syndrome: edema, pigmentation and ulceration .In the study of the edema in RC AVF was 1.23% and in BC AVF 5.79%.[18] But in contrast to this, limb edema was higher in the AVF group in our study. The edema in RC AVF was 3.5% and in BC AVF was 8%. We managed all limb edema conservatively.

Infection accounts for 20% of all AVF complications, which is ten times lower than the rate of infection of AVGs.[19] Most AVF infections involve perivascular cellulitis, which manifests as localized erythema and edema and is usually easily treated. Much more serious is an infection associated with anatomical abnormalities, such as aneurysms, hematomas or abscesses, which require surgical excision and drainage.[20] In the study of Susan et al, the overall rate of wound infection was 3.4% which was similar to our study where infection rate is 4.5 %. But there was a difference in wound infection rate between RC AVF and BC AVF. In the study of Khadatkar et al, the infection rate was 1.45% in RC AVF group and 1.23% in BC AVF group. In contrast, there was more infection in BC AVF group than in RC AVF group in our study having 6% and 3% respectively. We managed wound infection with regular dressing and antibiotics, when there was a gap we applied a secondary suture.

LIMITATION

The study was conducted only in single center, the follow up of the patients was of short duration so the findings could not be generalized in large population.

CONCLUSION

Though radio cephalic fistula is considered the first procedure of choice it's not always feasible to create it. The maturation and patency rate is higher in brachiocephalic arteriovenous fistula then radiocephalic arteriovenous fistula. But complications like limb edema and infection are slightly higher in brachiocephalic arteriovenous fistula.

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RESEARCH ARTICLE

Socio Demographic Profile and Risperidone Response in New Versus Old Schizophrenia Patients

Belbase M[1], Adhikari J[2]

ABSTRACT

Introduction: Schizophrenia is a mental disorder characterized with disorganized thinking, perception, expression of reality with significant social and occupational dysfunction. Two groups of drugs are in recent use namely first generation (typicals) and second generation (atypical) antipsychotics. Risperidone is a broad spectrum antipsychotic and has a role as a first-line agent for first break, mild to moderately ill patients and for severely ill treatment–refractory patients. **Aim**: This article tries to compare the risperidone response in newly diagnosed schizophrenia patients versus old patients already on some antipsychotics other than risperidone. **Methods**: This is an experimental intervention study of patients attending to psychiatry OPD and indoor in Nepalgunj Medical College, Kohalpur. Total 40 patients (27 new and 13 old) were selected and sample was collected in one year from January 2018 till December 2018. Positive and negative syndrome scale questionnaire was used to record the positive and negative symptoms of schizophrenia on baseline (week 0). Patients were followed up on week 4 and week 8 and the same positive and negative syndrome scale questionnaire was applied to record the improvement. Risperidone was given in therapeutic dose (4-8mg) on the basis of symptoms and improvement. **Results**: The study subjects were divided into new N=27 (17 male and 10 female) and old N=13 (7 male and 6 female). Maximum number of schizophrenia cases were in age group 15-25 and 35-44 years comprising 30 % in each group. Mean total duration of illness in new group was 23.89 ± 29.51 months (median being 12.0 months) while in old group it was 123.69 ± 83.34 months (median being 96.0 months) with significant difference between two groups **(p= <0.001)**.The mean risperidone dose in milligram on base line (week 0) was 4.15 ± 0.55 for old group while it was 4.04 ± 0.52 for new group. On week 4, the mean dose for old group was 5.08 ± 0.95 while for the new group it was 4.81 ± 1.08. On week 8, the dose for old group was 6.08 ± 1.32 while it was 5.15 ± 1.35 for new group. There was a significant difference in the drug dose on week 8 between old group and new group with p value of **0.047** (statistically significant). **Conclusion**: Our study suggests that schizophrenia is found in most productive age group. Risperidone is effective in both new and old schizophrenia patients however old patients need higher dose of risperidone than new patients.

Keywords: **Atypicals, Risperidone, Schizophrenia, Typicals**

1. Dr. Mohan Belbase
2. Dr. Jyoti Adhikari

[1] Department of Psychiatry, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke
[2] Department of Pediatrics, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

Address for Correspondence:

Dr. Mohan Belbase
Associate Professor
Department of Psychiatry
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: mohanbelbase90@gmail.com

INTRODUCTION

Schizophrenia is a mental disorder characterized with disorganized thinking, perception, expression of reality with significant social and occupational dysfunction. The term coined by Eugen Bleuler to denote splitting of psychic functions. [1] It afflicts 1% of population, usually begins before age 25 and persists throughout life. It inflicts persons of all social classes and comprises a group of disorders with heterogeneous causes and outcome.[2]

Two groups of drugs are in recent use namely first generation (typical) and second generation antipsychotics (atypical). First generation like haloperidol are said to cause more adverse effects including extrapyramidal side effects but second generations including risperidone causes other side effects including metabolic syndrome. There are case reports of deaths due to diabetic ketoacidosis in atypical antipsychotic users. [3] Though there is no clear evidence of difference in effectiveness between two groups of drugs, first generation are said to be effective in positive symptoms while second generations are effective in both positive as well as negative symptoms of

schizophrenia. More than ninety percent of patients are now treated using second generation drugs. Risperidone is a broad spectrum antipsychotic and has a role as a first-line agent for first break, mild to moderately ill patients and for severely ill treatment–refractory patients. [2] Though not many such type of studies from Nepal, one study showed risperidone to have quicker and better action than haloperidol with better safety profile in Nepali Schizophrenia patients. [4]Another similar study from India shows risperidone to have an edge over haloperidol in some of the psychosocial areas and overall clinical improvement. [5]

This article tries to compare the risperidone response in newly diagnosed schizophrenia patients versus old patients already on some antipsychotics other than risperidone.

METHODS

This is an experimental intervention study of patients attending to psychiatry OPD and indoor in Nepalgunj Medical College, Kohalpur. Diagnosis of schizophrenia was made based on ICD-10 criteria for research. The diagnosed cases were subdivided into new and old schizophrenia patients. These patients were examined and their symptoms were recorded by using modified positive and negative syndrome scale questionnaire on baseline (week zero), week four and week eight. Risperidone was given in the therapeutic dose as per needed in every visit. Biochemical and radiological investigations was done as required. After a written consent from patient or primary caretaker, patients aged 15-65 of either sex were included in the study. Patients having gross organic brain disorders, dependent on any kind of psychoactive substance, mental retardation were excluded from the study. A semi-structured performa was used to record the basic socio-demographic details.

Total 40 patients (27 new and 13 old) were selected and sample was collected in one year from January 2018 till December 2018. PANNS questionnaire was used to record the positive and negative symptoms of schizophrenia on baseline (week 0). Patients were followed up on week 4 and week 8 and the same PANNS (positive and negative syndrome scale) questionnaire was applied to record the improvement. Risperidone was given in therapeutic dose (4-8mg) on the basis of symptoms and improvement. These PANNS scores were compared and analyzed. Recorded data were assessed using SPSS using parametric (students t-test) and non parametric technique (Mann Whitney U test). Ethical consideration was done by obtaining the informed written consent from the subject or immediate guardian. Strict confidentiality of the information was maintained and result was utilized for the appropriate management of the cases concerned, similar cases in general and research purpose.

Instruments used in the study were

1. The ICD- 10 classification of mental and behavioral disorders, diagnostic criteria for research for schizophrenia
2. Semi structured performa developed by department
3. PANNS (positive and negative syndrome scale, modified)

RESULTS

The study subjects were divided into new N=27 (17 male and 10 female) and old N=13 (7 male and 6 female). Results are tabulated below.

Among the significant findings, mean total duration of illness in new group was 23.89 ± 29.51 months (median being 12.0 months) while in old group it was 123.69 ± 83.34 months (median being 96.0 months) with significant difference between two groups **(p= <0.001)**.

The mean risperidone dose in milligram on base line (week 0) was 4.15 ± 0.55 for old group while it was 4.04 ± 0.52 for new group. On week 4, the mean dose for old group was 5.08 ± 0.95 while for the new group it was 4.81 ± 1.08. On week 8, the dose for old group was 6.08 ± 1.32 while it was 5.15 ± 1.35 for new group. There was a significant difference in the drug dose on week 8 between old group and new group with p value 0f **0.047** (statistically significant).

There was no significant difference in the PANNS scores on base line, on 4th week and 8th week when comparing between the new old group using Mann Whitney U test (p= <0.05) suggesting that risperidone was equally effective in new as well as old schizophrenia patients.

Characteristics	Categories	Frequency (n)= 40	Percentage (%)
Age in years	15-24	12	30
	25-34	10	25
	35-44	12	30
	45-54	4	10
	55-64	2	5
Gender	Male	24	60
	Female	16	40
Marital status	Married	28	70
	Unmarried	12	30
Religion	Hindu	35	87.5
	Muslim	5	12.5
Education	Illiterate	10	25
	Literate	29	72.5
	Higher education	1	2.5
Occupation	Farmer	8	20
	Service	3	7.5
	Student	4	10
	Housewife	13	32.5
	Teacher	1	2.5
	Unemployed	11	27.5
Socioeconomic status	Lower	18	45
	Lower-middle	22	55
Family type	Nuclear	7	17.5
	Joint	33	82.5

Table I : Socio-demographic profile

Characteristics	Categories	Treatment group		P- value*	Remarks
		New	Old		
Sex	Male Female	17 10	7 6	0.836	NS
Marital status	Married Unmarried	18 9	10 3	0.391	NS
Religion	Hindu Muslim	23 4	12 1	0.469	NS
Education level	Illiterate Literate	8 19	2 11	0.286	NS
Occupation	Job holders Others	1 26	3 10	0.092	NS
Socio-economic status	Lower Lower-middle	12 15	6 7	0.592	NS
Family type	Nuclear Joint	4 23	3 10	0.408	NS

*t-test

Table II : Association between treatment groups (new and old schizophrenia patients) and socio-demographic profile of patients

Mean risperidone dose		Exposed	St. Deviation	P. value*	Remarks
Risperidone 0 (baseline)	Old	4.15	0.55	0.517	NS
	New	4.04	0.52		
Risperidone 4 (4th week)	Old	5.08	0.95	0.459	NS
	New	4.81	1.08		
Risperidone 8 (8th week)	Old	6.08	1.32	0.047	**S**
	New	5.15	1.35		

*t-test-Sig(2-tailed)

Table III : Relationship between mean risperidone doses and PANSS scores over follow ups

Scores	Groups	Median	1st quartile	3rd quartile	P value*	Remarks
Age	Old	34.0	21.5	41.0	0.909	NS
	New	30.0	24.0	40.0		
	Total	31.5	22.5	40.0		
Duration of illness (months)	Old	96.0	66.0	168.0	<0.001	S
	New	12.0	3.0	36.0		
	Total	30.0	7.25	72.09		
PANSS 0	Old	53.00	45.00	56.00	0.711	NS
	New	52.00	40.00	64.00		
	Total	53.00	42.00	61.75		
PANSS 4	Old	28.00	27.50	34.00	0.549	NS
	New	25.00	21.00	36.00		
	Total	28.00	22.25	35.75		
PANSS 8	Old	16.00	12.50	21.00	0.252	NS
	New	14.00	8.00	19.00		
	Total	14.00	9.50	19.75		

*Mann Whitney U test

Table IV : Table showing age, duration of illness and comparisons of PANNS scores on baseline (week 0), week 4 and week 8 between new and old schizophrenia group with their significance.

DISCUSSION

Maximum number of schizophrenia cases were in age group 15-24 and 35-44 years comprising 30 % in each group. This is similar to an Indian study in which the median age of schizophrenia was 28.5 years.[6]

Most of the patients were male (60 %) and married (70 %). Schizophrenia is equally common in male and female, this finding may be due to male being brought to health care facility sooner and more often due to male dominance in society and male being bread winner of family. Schizophrenia patients usually remain unmarried but the opposite finding in our study could be belief system in our society where marriage is regarded as treatment for many mental problems.

Most of the patients were Hindu (87.5 %) while others were Muslims (12.5%) which is in accordance to population distribution of mid-western Nepal. Most of our patients were from joint family covering 82.5 % while 17.5 % were from nuclear family. This is bit unusual in comparison to western literature where schizophrenia patients mostly live alone. This could be due to our culture of joint family.

Numerous studies have examined the comparative effectiveness and tolerability of various antipsychotics and in general they appear to be similarly effective with substantial difference in their adverse effects except for clozapine. Amisulpride, olanzapine, and risperidone have been shown in some meta-analyses to produce greater symptom response than antipsychotics other than clozapine.[7]

Some literature also mention about better risperidone response in newly diagnosed patients without previous exposure to any neuroleptics. This study suggests significant difference in the dose of risperidone on week 8 between new and old schizophrenia patients with P = 0.047 (<0.05). This indicates old patients need higher dose of risperidone than new patients. One study regarding comparing of risperidone and haloperidole in first episode psychosis, 42 % of the risperidone group experienced a relapse compared with 55 % of haloperidole group. The median time for relapse was 466 days for risperidone treated subjects while 205 days for haloperidole received group. It concluded that long term risperidone prevents relapse in more patients and for longer time.[8]

In another study regarding maintenance treatment of schizophrenia with risperidone or haloperidole: 2 year outcome, when compared with patients given a low doses of haloperidole, risperidone treated patient experienced similar improvement in positive and negative symptoms and similar risk of psychotic exacerbations. However risperidone treated patients appeared to fell subjectively better, as indicated by less anxiety and depression with fewer extrapyramidal side effects as compared to haloperidole.[9]

Another study in Nepali schizophrenia patients reveals risperidone to have quicker and better action than haloperidol with better safety profile.[4]

This study suggests risperidone to be effective in new and old schizophrenia patients.

LIMITATION

Small sample size, unable to randomize the sample, short duration of follow ups, unequal size of sample in two groups and non-blind study without placebo control are some of limitations of this study.

CONCLUSION

Our study suggests that schizophrenia is found in most productive age group. Risperidone is effective in both new and old schizophrenia patients however old patients need higher dose of risperidone than new patients.

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RESEARCH ARTICLE

Validation of WHO-IMNCI Algorithm for Jaundice in 0-2 Months Aged Infants at Tertiary Level Hospital

Kanodia P[1], Mahaseth S[1], Paranjuli V[1]

ABSTRACT

Introduction: For the effective management of these major childhood illnesses, WHO and UNICEF have developed the "Integrated Management of Neonatal and Childhood Illness" (IMNCI) Strategy. **Aim:** The aim of study is to evaluate the utility of the WHO/ UNICEF algorithm for Integrated Management of Neonatal and Childhood Illness (IMNCI) for jaundice up to two months of age. **Methods:** This is Prospective observational comparative study. Total of 300 subjects were taken from Emergency and Outpatient Department of Pediatrics. The treatment steps were identified as according to the 'Assess and Classify' module of IMNCI algorithm. All relevant investigations were performed, using appropriate methods. Blood sugar was done in all recruited children and serum bilirubin levels were done in all infants presented with jaundice. Based on this detailed clinical evaluation and relevant investigations, final diagnosis were made and therapies were given. These diagnosis and treatments were considered as the 'Gold Standard' for comparison. **Results:** There were 300 young infants, of whom 162(54%) were male and 138(46%) were female infants. Total of 146 infants were admitted, 24 from OPD and 122 from Emergency. 154 infants were sent home after initial management in hospital. Severe jaundice was present in 24 infants according to IMNCI and 12 infants according to Gold Standard in 0-2 months of age. The predictive utility of algorithm for the diagnosis of severe jaundice with a sensitivity of 100%, specificity of 75%, positive predictive value of 50% and negative predictive value of 100% in 0-2 months of age group. **Conclusion:** Algorithm performed well in identifying severe jaundice with the sensitivity of 100% and specificity of 95%.

Keywords: **Childhood illness, Jaundice, WHO-IMNC**

Authors:

1. Dr. Piush Kanodia
2. Dr. Sameer Mahaseth
3. Dr. Vishnu Paranjuli

[1] Department of Pediatrics, Nepalgunj Medical College and Teaching Hospital, Nepalgunj, Banke,

Address for Correspondence:

Dr. Piush Kanodia
Associate Professor
Department of Pediatrics
Nepalgunj Medical College and Teaching Hospital
Nepalgunj, Banke, Nepal
Email: piushkanodia@yahoo.com

INTRODUCTION

Many Surveys reveal that many sick children are not properly assessed and treated by these health care providers, and that their parents are poorly advised.[1] Most of the neonatal deaths occurs during the first week of life, making it the most vulnerable period of life.[2] Early neonatal period (0-7 days) is the most most vulnerable period and needs to be taken into consideration.[3] For effective management of major childhood illnesses, WHO and UNICEF have developed the "Integrated Management of Childhood Illness" (IMCI) Strategy.[4,5] Generic IMCI program did not initially include newborn less than one week old. There are very few published studies where IMNCI algorithm has been tested in children 7 days –2 months old [6,7] within Nepal subcontinent. IMNCI is an integrated approach to child health that focuses on the well-being of the whole child. IMNCI aims to reduce death, illness and disability, and to promote improved growth and development among children under 5 years of age. IMNCI includes both preventive and curative elements that implemented by families and communities as well as by health facilities.[8]

Hence this present study therefore was done with the objective to evaluate the validity of IMNCI algorithm in 0-2 months of age with special emphasis in early neonatal period.

METHODS

This study is prospective observational comparative study. It is conducted at Emergency and Outpatient Department of Pediatrics, Nepalgunj Medical College, Nepalgunj. Study Duration was One Year from January 2019 to December 2019. In this study the sample size taken were total of 300 subjects Emergency and Outpatient Department of Pediatrics. The sample size was calculated to be sufficient to detect a difference

of 10% in diagnostic agreement form the gold standard with 90% power and an alpha of 0.05.

Inclusion criteria: Any infant presented with a fresh episode of illness in the Emergency or the Outpatient Department of the Pediatrics in NGMC was included.

Exclusion criteria: Infants attended the well-baby clinic or immunization clinic for routine visits and follow-up care were kept out of the study.

Data collection: For all the children in the study, detailed history and clinical examination listed in IMNCI algorithm, in the same order. The treatment steps were identified as according to the 'Assess and Classify' module of IMNCI algorithm and was recorded in the proforma. The study subjects so selected were managed according to the protocol of treating unit under the supervision of the senior faculty. All relevant investigations were performed, using appropriate methods. Blood sugar was done in all recruited children and serum bilirubin levels were done in all infants presented with jaundice. Based on this detailed clinical evaluation and relevant investigations, final diagnosis were made and therapies were given. These diagnosis and treatments were considered as the 'Gold Standard' for comparison. The study children were either admitted or sent home after initial evaluation, depending upon the nature and severity of illness. The hospitalized subjects were followed up till the final outcome. Feeding counseling was given to every child with low birth weight or feeding problems. Consent: A written informed consent was taken from all the parents of babies enrolled in the study Data analysis: The data was evaluated in the predesigned proforma, data were entered into MS Excel and analyzed using SPSS 20.01 for windows 7, chi square test and fisher's exact test, sensitivity, specificity, positive predictive value and negative predictive value.

RESULTS

A total of 300 infants between 0-2 months who fulfilled the study criteria were studied. The baseline profile of study infants is as follows. There were 300 young infants, of whom 162(54%) were male and 138(46%) were female infants as shown in Table I.

Gender	Number	Percent (%)
Male	162	54%
Female	138	46%
Total	**300**	**100%**

Table I : Sex distribution of study infants (0-2 months)

	Admitted	Sent home	Total
OPD	24	126	150
Emergency	122	28	150
Total	**146**	**154**	**300**

Table II : Relationship between recruitment and hospitalization (0-2 months)

Out of 300 young infant, 162 infants were 0-7 days old and remaining 138 were in the age group from 7 days upto two months and mean age is 13.27 days which is depicted in Table III.

Duration	Number	Percent
0-7days	162	54%
7days- 2months	138	46%
Total	**300**	**100%**

Table III : Age distribution of study infants

Utility of Algorithm to Identify Jaundice

The agreement between the IMNCI algorithm and Gold Standard in identification of jaundice is as follows Severe jaundice was present in 24 infants according to IMNCI and 12 infants according to Gold Standard in 0-2 months of age as depicted in Table IV.

	IMNCI	Gold Standard
No Jaundice	208	228
Jaundice	68	60
Severe Jaundice	24	12
Total	**300**	**300**

Table IV : Accuracy of algorithm to identify jaundice (0-2 months)

The predictive utility of algorithm for the diagnosis of severe jaundice with a sensitivity of 100% and specificity of 75% in 0-2 months of age group as shown in Table V.

Sensitivity	100%
Specificity	95%
Positive predictive value	50%
Negative Predictive Value	100%

Table V : Utility to identify severe jaundice (0-2 months)

Table VI and VII shows accuracy of algorithm and its utility respectively for severe jaundice in infants 0-7 days of age. Severe jaundice was present in 18 infants according to IMNCI and 10 infants according to Gold Standard in 0-7 days of age as depicted in Table VI.

	IMNCI	Gold Standard
No Jaundice	114	116
Jaundice	30	36
Severe Jaundice	18	10
Total	**162**	**162**

Table VI : Accuracy of algorithm to identify jaundice (0-7 days)

The predictive utility of algorithm for the diagnosis of severe jaundice with a sensitivity of 100% and specificity of 94.7% in 0-7 days of age group was found as shown in Table VII.

Sensitivity	100%
Specificity	94.7%
Positive predictive value	55.5%
Negative Predictive Value	100%

Table VII : Utility of identity severe jaundice (0-7 days)

Table VIII and IX shows accuracy of algorithm and its utility respectively for severe jaundice in infants 7-59 days of age Severe jaundice was present in 6 infants according to IMNCI and 2 infant according to Gold Standard in 7-59 days of age as depicted in Table VIII.

	IMNCI	Gold Standard
No Jaundice	94	112
Jaundice	38	24
Severe Jaundice	6	2
Total	**138**	**138**

Table VIII : Accuracy of algorithm to identify jaundice (7-59 days)

Sensitivity	100%
Specificity	97%
Positive predictive value	33%
Negative Predictive Value	100%

Table IX : Utility to identify severe jaundice (7-59 days)

DISCUSSION

The IMCI strategy promotes the accurate identification of childhood illness in the outpatient settings, ensures, appropriate combined treatment of all major illnesses, strengthens the counselling of caretakers and the provision of preventive services, and speeds up the referral of severely ill children.[9,10] This information contributed to the development of the Integrated Management of Childhood Illness (IMCI) algorithms during the mid1990s, which standardized the management of sick young infants at first-level health facilities.[11]

A total of 300 infants between 0-2 months who fulfilled the study criteria were investigated. Of these 162 (54%) were 0-7 days and 138 (46%) were 7 days – 2 months of age. Thus, a considerable number of study infants were between 0-7 days of age to allow us to see whether the IMNCI algorithm which has additionally included early neonatal period (0-7 days), can be utilized with equal efficacy in 0-7 days as in 7 days- 2 months age group. About 46% of study subjects were females and 54% were males.

Relationship between Recruitment Site and Hospitalization

Out of 300 young infants, 150 infants were recruited both form OPD and emergency of hospital. Out of 150 infants recruited form OPD 16.0% were admitted and remaining 84.0% were sent home after initial evaluation. The corresponding figures form emergency was 81.35 and 18.7% respectively.

Similar study conducted by Kaur et al[12] which showed that 97% of infants coming to emergency were admitted and rest sent home as compared to 54% admission from OPD. Thus, hospitalization rates among those who presented to the emergency were much higher than those who attended OPD suggesting that a significantly higher proportion of severely ill patients reported to emergency. However, amongst the patients in early neonatal period (0-7 days), 28% of infants presenting to OPD were hospitalized and 72% were sent back home. Corresponding figures for infant presenting to emergency was 80.3% and 19.7% respectively.

Goswami et al[3] showed that 66% of infants in early neonatal period (0-7 days) were admitted as compared to 52% in 7 days – 2 months age groups. Gupta et al[6] showed that 595 of infants were admitted and rest 41% were sent back home in 7 days -2 months age groups. Neonates less than 7 days of age brought to the hospital were sicker and were hospitalized when they presented to OPD and emergency. Out of 300 infants, according to IMNCI and Gold Standard severe jaundice was present in 24(8%) and 12(4%) respectively. Severe Jaundice had high sensitivity of 100% and specificity of 95%. Study conducted by Kaur et al[12] showed that according to gold standard jaundice was present in 50.6%in 0-7 days and 17.3% in 7 to 59 days infants. In study conducted by Bhattacharya et al. according to IMNCI Jaundice and severe jaundice was present in 6% infants and 1.7% infants respectively as compared to 34% and 8% respectively in the present study. In this study 7.7% infants had jaundice according to gold standard as compared to 20% in the present study. Sensitivity and Specificity to identify jaundice were 66.67% and 99.07% as compared to 100% and 95% in the present study .[13] According to bicentric study in Bolivia conducted by Mazzi et al jaundice was present as per IMNCI in 0-7 days and 7-59 days as 49% and 32.8% infants as compared to 29% and 31% in the present study respectively. In this study jaundice as per gold standard, present in 0-7 days and 7-59 days infants was 55% and 38.5% infants as compared to 28% and 18.8% in the present study respectively.[14] This high diagnosis of jaundice according to IMNCI and gold standard was similar to that in the present study.

In study conducted by Thummakomma M et al jaundice was present according to gold standard in 0-7 days as 54.2% and 7-59 days as 45.7% compared to 28% and 18.8% in the present study respectively. According to IMNCI jaundice was present 19.8% as compared to 30.6% in the present study. Sensitivity, specificity, Positive predictive value and negative predictive value in study conducted by Thummakomma M et al and in the present study was 61.3%, 95%, 81.4%, 94.6% and 100%, 95%, 50%, 100% respectively which is comparable .[15]

LIMITATION

IMNCI Algorithm performed well in identifying severe jaundice and is important tool to diagnose severe jaundice by health care professional. To increase the power of study sample size should be increased and follow up should be done.

CONCLUSION

The present study was done to validate the IMNCI algorithm in young infants 0-2 months of age. Of the total 300 infants studied 162(54%) were 0-7 days of age and 138 were 7 days-2 months of age. Seventy-five infants were recruited both from OPD and emergency. As per Gold Standard 146(48.7%) were hospitalized and 154(51.3%) were sent back home and managed on outpatient basis after initial evaluation. IMNCI algorithm performed well in identifying severe jaundice with the sensitivity of 100% and specificity of 95%.

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RESEARCH ARTICLE

Effectiveness of Surgical Treatment of Rockwood Type III Acromioclavicular Joint Dislocation Using Clavicle Hook Plate and Tension Band Wiring: A Comparative Study to Evaluate the Functional and Surgical Outcome

Shrestha DK[1], Shrestha M[2], KC D[1], Karki P[1], Shrestha S[1], Yogi S[1]

ABSTRACT

Introduction: Acromioclavicular joint dislocation Type III is still controversial for its management, despite of numerous trials and reviews. **Aim:** To compare and evaluate the functional and surgical outcome of Rockwood Type III acromioclavicular joint dislocation treated surgically with clavicular Hook plate and Tension Band wiring with K-wires. **Methods**: In a prospective hospital based interventional study comprising of total 22 patients with a mean age of 31.36 ± 7.53 years who presented with Rockwood Type III acromioclavicular joint dislocation were carried between January 2018 to December 2019. They were graded according to Rockwood et al. classification. All 22 patients underwent open reduction and internal fixation. These patients were divided into two groups according to operative procedure; of which 11 patients were treated with clavicular hook plate (CHP) and rest 11 were treated with tension band wiring with K-wires (TBW). Descriptive comparison was tabulated during pre-operative, intra-operative and post-operative periods. The Constant-Murley Shoulder scoring system was applied for evaluating the results. **Results**: The mean follow up period was 7.6 months. The clavicular hook plate was removed at 10 months in one patient due to severe pain and limited range of motion , and removal of Tension Band wiring with K-wires were done in two patients due to wound dehiscence and Kirschner wire back out at 5 and 6 months. The mean Constant- Murley shoulder score was 82.6 (min. 70 & max. 93) in clavicular hook plate and 74.72 (min 68 & max. 84) in Tension band wiring with K-wires which found to be significantly difference in mean scoring between two groups. **Conclusion**: Patients treated with Clavicular Hook Plate for Rockwood Type III acromioclavicular joint dislocation had a very good functional and surgical outcome over Tension Band wiring with K-wires.

Keywords: **Acromioclavicular joint, Clavicular hook plate (CHP), Constant Murley score, Tension band wiring (TBW)**

Authors:

1. Dr. Dinesh Kumar Shrestha
2. Dr. Merina Shrestha
3. Dr. Dipendra KC
4. Dr. Prateek Karki
5. Dr. Sabin Shrestha
6. Dr. Sushil Yogi

[1]Department of Orthopedics, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

[2] Department of Community Medicine, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

Address for Correspondence:

Dr. Dinesh Kumar Shrestha
Associate Professor
Department of Orthopedics
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: dr_dineshstha@yahoo.com

INTRODUCTION

The Acromioclavicular joint dislocation were also a concerned back to the time of Hippocrates (460-377 BC) and Galen (129-199 AD).[1] Acromioclavicular joint dislocations are increasing in incidence constituting approximately 9-12% of all shoulder injuries.[2,3] The effectiveness of surgical management for Acromioclavicular joint dislocation is still controversial despite of numerous trials and reviews. These injuries often occur in and around third decade of life due to fall from a height, fall on an outstretched arm and contact sports injuries, males are predominantly affected with a male: female ratio of 5:1.[4]

In acromioclavicular joint dislocation, Rockwood classification is the widely used. It classifies the Acromioclavicular joint dislocation into six types.[5] Type I, II, III are more frequent and type IV, V and VI are rarer. In type I, Acromioclavicular ligament is strained, in type II acromioclavicular joint is disrupted and Coracoclavicular ligament is strained while in type III, Acromioclavicular and Coracoclavicular ligaments both are

disrupted, in type IV distal, clavicle is positioned posterior to acromion process, in type V, there is a gross superior dislocation of the acromioclavicular joint with ruptured Acromioclavicular and Coracoclavicular ligaments and joint capsule and in type VI, distal clavicle positioned inferior to coracoid process.[6]

Type I and II are both are managed conservatively[7], type IV-VI are preferred for surgery [8] and type III are variably treated. The best treatment for Rockwood Type III acromioclavicular joint dislocation is still unclear and controversial. The hardware used in this study was3.5 mm Clavicular Hook plate and Tension Band Wiring with K-wires. The clavicular hook plate is a metallic device that keeps the acromioclavicular joint in a reduced position by hooking its tip under the acromion making a tunnel and fixing it to the clavicle with screws.[9] Similarly, Tension Band Wiring, a fixation method done with two Kirschner wires of 2.0 mm which was introduced through lateral end of acromion process after acromioclavicular joint reduction and supplemented by circlage wire of 18G.[10] The best treatment for Rockwood Type III acromioclavicular joint dislocation is still unclear and controversial. Some authors obtained good to excellent results performing non-surgical management of the patients with type III dislocations.[11] While others reported persistent pain and other post up complications associated with follow up evaluations.[12,13]

However, surgical intervention is better choice to improve functional outcome of type III Acromioclavicular injuries in young and active patients of specific age group of population who need quick recovery to return back in their daily work activities in time.[14]

The hypothesis of this study reflects the effectiveness of surgical procedure using CHW method is better than TBW method in comparison of its surgical and functional outcome. This study aimed to compare pre-operative, intra operative and post-operative interventional evaluations of type III ACJ dislocations with their follow ups within six and half month of duration. None of such study conducted in mid-western and far western of Nepal, it is likely to enable the surgeons to prefer such management in terms of stable and rigid fixation, better functional outcome and less time consuming approach for the management of poor patients.

METHODS

This was a prospective hospital based interventional study carried out from January 2018 - December 2019.The study subjects were total 22 adults ranging from 22-48 years as non-probability purposive sampling technique within two years of duration. Two groups were selected on the basis of treatment procedure; one group was comprised of CHP while other group was comprised of TBW. After obtaining ethical permission for the study from the institutional review committee of Nepalgunj Medical College Teaching Hospital, Kohalpur, informed consent was being pertained to maintain the confidentiality of patients.

Patients with unilateral, acute acromioclavicular joint dislocation and close Rockwood Type III with age between twenty two to forty eight years were included in the study whereas open acromioclavicular joint dislocation, associated fractures in scapula, ipsilateral lateral end of clavicle and with other systemic co-morbidities were excluded.

After clinical assessment of the acromioclavicular joint carried out by the Orthopedic surgeon, all the patients were subjected to radiographic evaluation of an anteroposterior view of the shoulder and stress views.[15]They were treated surgically within 24-72 hours of arrival at the hospital in beach chair position under general anesthesia. Among them 11 patients were treated with clavicular hook plate and 11 patients were treated with Tension Band wiring with K-wires. All patients were followed up for 16 months.

Clavicular Hook Plate

Clavicular hook plate were performed under general anesthesia in the beach-chair position. A curvilinear incision of 5 cm was made over the lateral end of clavicle after manually reducing the acromioclavicular joint and exposed both with full thickness soft tissue flap. Any articular cartilage debris in the joint was removed then the acromioclavicular joint was reduced manually and the hook of the plate was inserted beneath the acromion and the proximal end of the plate was screwed into the clavicle by 3.5 mm screws. Skin was closed in layers after irrigation.

Tension Band Wiring

Tension band wiring was also performed under general anesthesia in the beach-chair position. A curvilinear incision was made 2 cm behind the lateral end of clavicle and extended along the axis of clavicle to the acromion. The lateral end of clavicle, acromioclavicular joint and the acromion process were exposed. The displaced clavicle was reduced manually and fixed with two parallel 2.0 mm stainless steel K-wires using a power drill from the lateral end of the acromion process. The 3.5 mm cortical screw was inserted after pre drilling with drill bits of 3.2 mm superiorly and medially over the lateral end of clavicle 2 cm from the acromioclavicular joint. This fixation was supplemented by stainless steel circlage wire of 18 G making a figure of eight configuration, purchasing cortical screw neck and the lateral end of both the K-wires. The K-wires were bent, cut and its end buried beneath the soft tissue and the skin was closed in layers after irrigation.

Postoperatively all patients were immobilized in arm pouch sling for two weeks. All wounds healed primarily with no wound dehiscence. Active range of motion including shoulder abduction up to 90^0 was started immediately as per pain tolerance. After two weeks sutures were removed and they

were put on physiotherapy with passive and active-assisted shoulder range of motion. They were followed up for 16 months and the results were assessed at 12 months post-surgery. The clinico-radiological evaluation was done at 1, 3,6,12 and 16 months. The functional outcome was assessed using Constant-Murley shoulder score. This scoring system consists of four variables that are used to assess the function of the shoulder. The right and left shoulders are assessed separately. The subjective variables are pain (15 points) and activities of daily living (20 points) which gives a total of 35 points. The objective variables are range of motion (40 points) and strength (25 points) which gives a total of 65 points.[16,17,18]

The results of two groups were compared on all study variables to determine whether there was any difference between two surgical procedures. All the relevant information was entered into Microsoft excel, statistical package for social services (SPSS) version 20 and data was analyzed by using statistical tools; frequency, standard deviation, one sample T test and Pearson's correlation coefficient test with statistically significance value less than 0.05.

RESULTS

Variables	CHP (f)	TBW(f)
Mode of Injury		
Fall from tree	5	4
Fall from cliff	5	1
RTA	1	4
Sports Injury	0	2
Site of Injury		
Right	10	11
Left	1	0

Table I. Frequency distribution of pre-operative status between two groups. (N=22)

Mean age of CHP group was 31.45 years and TBW group was 31.27 years. The mechanism of injury included total number of fall from tree in 10 (45.45%), fall from cliff in 6 (27.27%), road traffic accident in 4 (18.18%) and due to contact sport injury in 2 (9.09%) patients. In clavicular hook plate (CHP) group consisted of 10 male and one female patient had ten right sided dislocations and one left sided dislocation. However, patients in the tension band wiring (TBW) group consisted of all 11 male had right sided dislocations.

Variables	CHP				TBW			
	N	Mean	Std. Deviation	t	N	Mean	Std. Deviation	t
Age	11	31.45	± 6.99	14.92	11	31.27	± 7.53	13.76
Duration of Surgery (mins)	11	50.27	± 16.48	10.11	11	70.00	± 15.00	15.47
Total amount of blood loss (ml)	**11**	**150**	**± 45.82**	**10.85**	**11**	**191**	**± 45.78**	**13.89**

Table II : Comparison of intra operative status between two groups using one sample T-test (N=22)

Table II showed mean blood loss in the patients in CHP group and TBW group were 150 ml with SD ± 45.82 and 190 ml with SD ± 45.78 respectively which found to be statistically significant difference between mean blood loss of CHP and TBW group (P ≤ 0.001). Similarly, mean duration of surgery of CHP group and TBW group were 50.27 min. and 70.00 min. respectively also showed significant results between two groups. (P ≤ 0.001)

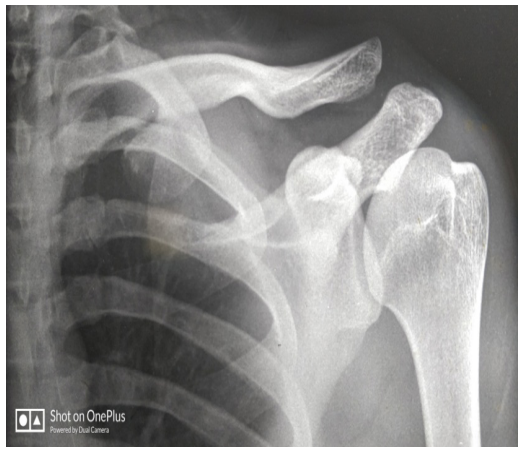

Figure 1a

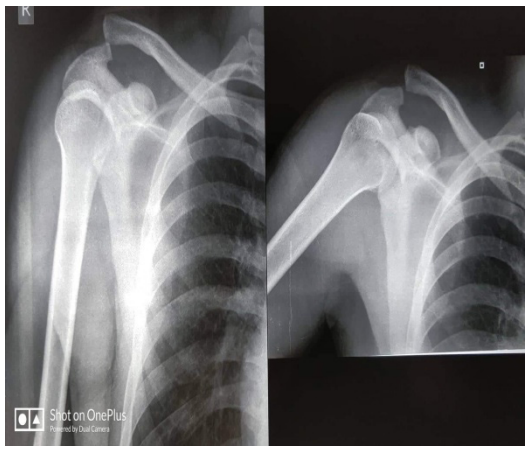

Figure 1b

Figure 1 : Pre-operative x-rays for CHP group (Figure 1a) and TBW group (Figure1b)

As per table III, this study encountered only one patient in CHP group, had severe pain and limited range of motion with good Constant-Murley score of 70 at 10 month. Two out of 11 patients had to remove the tension band wiring due to wound dehiscence and K-wire back out at 5 and 6 months whose Constant-Murley score was 68 and 72 respectively. All the patients were followed up for 16 months post operatively. The internal fixation device was removed within 5 to 12 months depending on the patient's status of recovery. The mean of Constant Murley scores were 82.63 with SD ± 7.54 in CHP group and 74.72 with SD ± 4.81 in TBW group. Statistically significant results were obtained while comparing the mean scoring of functional outcome in between subjects of two groups (p = < 0.001).

Groups	Post up complications					Constant Murley Score	
Types of Surgery	Severe pain	Limited ROM	Wound dehiscence	K wire back out	None	Mean± SD	P
CHP	1	1	0	0	9	82.63 ± 7.54	0.001
TBW	0	0	2	2	7	74.72±4.81	0.001

Table III : Frequency distribution of post operative complication and comparision of mean of functional scoring in two groups using one sample T-test (N=22)

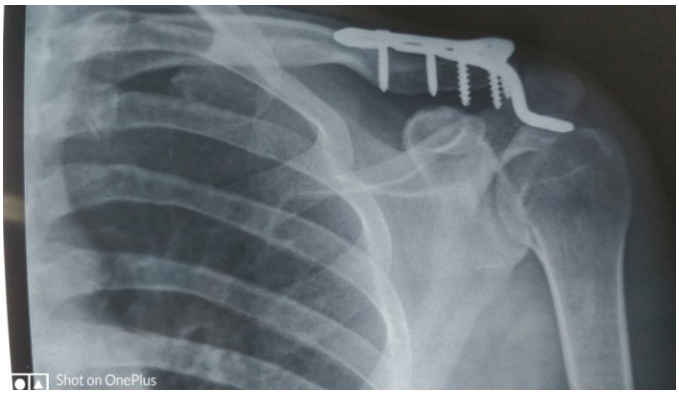

Figure 2a

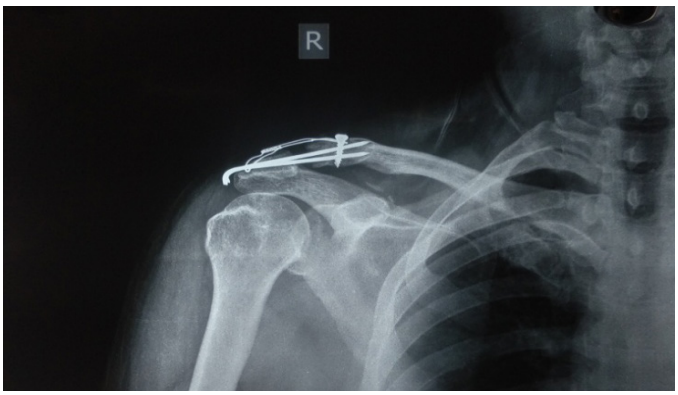

Figure 2b

Figure 2 : Post-operative x-rays showing CHP figure (2a) and TBW figure (2b)

As shown in table no. IV and fig. no. 3, the subjects of CHP group had maximum blood loss of 220ml with duration of surgery ranging min. 30 minutes to max. 90 minutes while in subjects of TBW group the maximum blood loss was 250 ml with duration of surgery ranging from 50 minutes to 100 minutes. The bivariate relation between two dependent variables in subjects of CHP group showed positive and moderate linear relationship to each other (r = 0.47) with statistically significant correlation (p ≤ 0.05) in total population. In contrast, the subjects of TBW group had no linear relationship between blood loss and duration of surgery (r = 0.0) and have found to be statistically insignificant correlation (p = 0.94) in total population.

	N(f)	(Min- Max)	Mean ± SD	Correlation Mean ± SD Coefficient (r)	sig. (2-tailed)
CHP Duration of Surgery (mins.)	11	30.00-90.00	50.2 ± 16.4	0.47	0.020
Blood loss	11	90.00-220.00	150 ± 45.8		
TBW Duration of Surgery (mins.)	11	50.00-100.00	70 ± 15.0	0.0	0.94
Blood loss	11	120.00-250.00	191 ± 45.7		

P = ≤ 0.05

Table IV : Comparison of intra operative relation between two groups using Pearson's correlation co-efficient test (N=22)

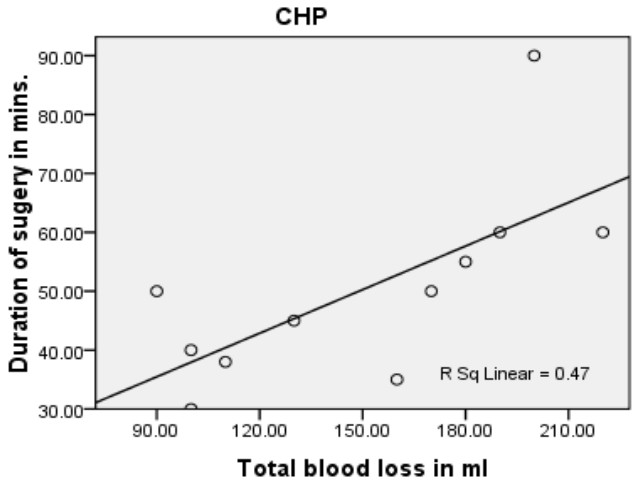

Figure 3a

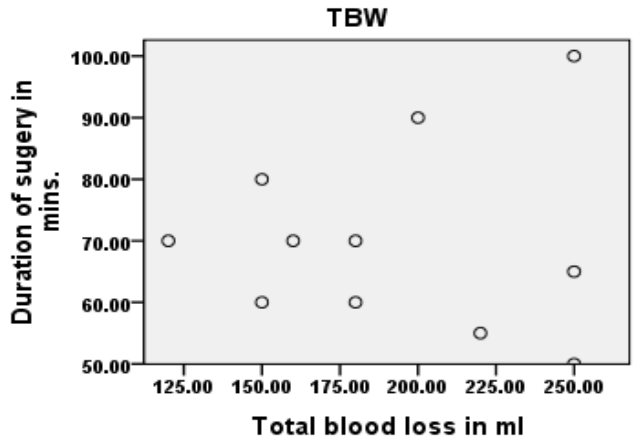

Figure 3b

Figure 3 : Scatter plot diagram of bivariate correlation co-efficient of mean blood loss and duration of surgery between two group showing positive correlation in Figure 3a and no correlation in Figure 3b.

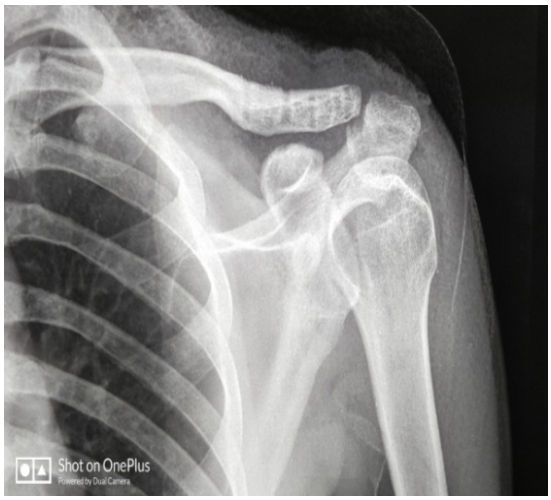

Figure 4a

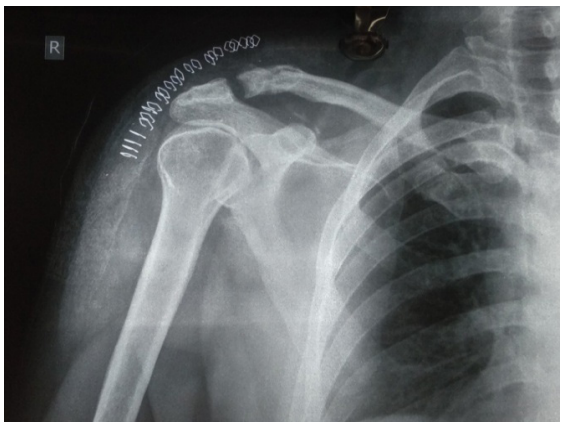

Figure 4b

Figure 4 : Follow up x-rays showing status of healing process after removal of implant for CHP (4a) and TBW (4b) group.

DISCUSSION

Despite of numerous trials and reviews, there is still no consensus and clear view on ideal device or method for fixation of type III acromioclavicular joint dislocation. However, there are both conservative as well as operative evidences, but most of the patients treated with conservative method had unsatisfactory results, with residual pain during shoulder movement, paranesthesia, loss of strength and fatigue with overhead activities and cosmetic concerns.[19,20] Hence operative methods are being done quite frequently such as clavicular hook plate, Fixation with K-wires, Tension band wiring, Fixation with double button technique, reconstruction of the Coracoclavicular ligaments with auto graft or allograft tendon, Bosworth screw fixation and many more.[21] In this study we have compared the surgical and functional outcome of clavicular hook plate and tension band wiring done in Rockwood Type III acromioclavicular joint dislocation. In both the groups, mean age is very similar; 31.45 years in clavicular hook plate and 31.27 years in tension band wiring with K-wires.

In first group the hook of a clavicular hook plate is placed under the acromion and act as a leverage to push the plate downward, maintaining a proper anatomical alignment of lateral end of clavicle with that of acromion, providing a stable environment for the healing of ligaments and joint capsules.[22] This technique is simple, yet can be performed with only basic instruments by every surgeon. However the presence of hook underneath the sub acromion space and may have adverse effects and easily leads to pain and stiffness of shoulder, which subsides easily by the time.[23] This study encountered only one patient with the above mentioned adverse effects which was addressed by removing the plate at 10 months. He had good Constant-Murley shoulder score of 70. The mean difference of functional score had (82.63 with SD± 7.84) in CHP group and (74.72 with SD± 4.81) in TBW group, which revealed significant and improved outcome at 12th week of follow up subsequently using clavicular hook plate method than using tension band wire method. Study done in military personnel by Narinder kumara had also shown similar results.[24]

Gohring et al. has shown higher risk of complications for tension band wiring (43%) while treating acromioclavicular joint dislocation.[25] This study has confirmed the same in comparison to CHP. During early postoperative complication, two cases from TBW group had wound dehiscence and k – wire back out which was addressed by removing the tension band wiring at 5 and 6 months though their Constant-Murley shoulder score were 68 and 72 respectively.

In this study, visual estimation method for blood loss measurement is applied though it provides least accuracy but it is commonly used.[26] Mean blood loss was 150 ml in CHP group whereas 191 ml in TBW with K-wires. The surgical time is measured by using a stop watch. It starts immediately from skin incision to the last knot of skin closure. The duration of surgery for clavicular hook plate group was significantly shorter by mean 50.27 min. probably due to easy procedure, single plate device with good fixation than in TBW group where wound incision is larger with uses of many hard wares. This study has shown significant and moderate positive correlation between duration of surgery and blood loss in CHP group than in TBW group. As a result, shorter the procedure, lesser the blood loss exist in CHP group. Thus, the hypothesis formulated in this study is strongly supported by the concrete evidence based on comparative outcomes of two groups.

The conclusive outcome depends upon the various factors such as the study group, patient activity requirement, surgical expertise, types of fixation and reconstruction, and an environmental factors etc.[27]

LIMITATIONS

This study had various limitations. The sample size of study was not large enough (twenty two), hence cost effectiveness could

not be analyzed due to less study number, Axillary radiographs were not performed for assessing the severity of dislocation and above all, ignorance of the pathology due to poor socio-economic and poor intellectual status of the people. However, this study may contribute to national data or reviews for making a common consensus of our country.

CONCLUSION

The comparative study of CHP and TBW for Type III Acromioclavicular joint dislocation is effective techniques regarding the subjective view; pain and activities of daily living, and radiographic results. However, the objectives ie; shoulder range of motion, Constant Murley Score and degree of strength are better in CHP group. Similarly, shorter the duration of surgery, the lesser the amount of blood loss emphasize on quick recovery and return back to normal activities earlier in case of CHP method is comparatively better than TBW method. So, Patients treated with CHP has a very good functional and surgical outcome over TBW.

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RESEARCH ARTICLE

Outcomes of Percutaneous Nephrolithotripsy With or Without Nephrostomy Tube: A Comparative Study

Shrestha NM

ABSTRACT

Introduction: Percutaneous Nephrolithotripsy (PCNL) is one of the most accepted surgical modality for removal of renal stone. Placement of a nephrostomy tube at the end of PCNL is a standard procedure for PCNL, however many reports have showed the safety and efficacy of tubeless PCNL for the removal of renal stone. **Aim:** The present study aimed to report the outcomes of PCNL with or without nephrostomy tube. **Methods**: It is Prospective Hospital Study conducted from June 2017 to April 2020 in the Department of Urology Nepalgunj Medical College. Total 153 patients under inclusion criteria were divided into two groups. Group 1 (75 patients) was allocated to patients who were being treated under standard PCNL procedure while Group 2 (78 patients) was allocated for patients who were being treated under Tubeless PCNL procedure. The two groups were compared for operation time (minutes), hospital stay (days), post operative dose of analgesic (mg), post operative complications such as, leakage (%), bleeding (%) and infection (%). Data were analyzed from SPSS and p-value less than 0.5 was considered as significant. **Results:** In Group II the mean hospital stay, analgesic dose and rate of leakage was significantly lesser than Group I ($p<0.05$) whereas, the mean operation time, rate of infection and bleeding were not significantly different between two groups ($p>0.05$). **Conclusion**: Tubeless PCNL procedure causes more rapid recovery and earlier discharge from the hospital, reduction in postoperative pain and no leakage when compared to standard tubless PCNL.

Keywords: **Nephrotomy, Percutaneous Nephrolithotripsy (PCNL), Standard Percutaneous Nephrolithotripsy, Tubeless Percutaneous Nephrolithotripsy**

Author:

Dr. Naresh Man Shrestha

Address for Correspondence:

Dr. Naresh Man Shrestha
Associate Professor
Department of Urology
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: drnms1973@gmail.com

INTRODUCTION

Kidney stones is a common disease that affects at least 10% of people. Renal stone is a major public

health problem with a significant percentage of patients who needs surgical treatment.[1] Over the period of time there have been dramatic changes in the surgical treatment of renal stone. Various non-invasive, minimally invasive, and invasive methods have been reported as a treatment for kidney stones, which comprises: medicinal treatment, open renal surgery, extracorporeal shock wave lithotripsy (ESWL) and percutaneous nephrolithotomy (PCNL). In the past 30 years, PCNL is proved to be minimally invasive method which is an effective treatment for large stones located in the kidney and upper ureter. PCNL is a more effective treatment for stones <2 cm compared with the ESWL method.[2]PCNL includes four steps: access to the kidney, dilatation of the tract (access site), nephroscopy and fragmentation of stones, and finally insert a nephrostomy tube. Until 1997, the standard PCNL method used a nephrostomy tube which is placed at the end of PCNL. Nephrostomy tube is a thin plastic tube that is placed in the kidney from the back through the skin where tract is made. A nephrostomy tube is placed to provide adequate urinary drainage, hemostatic tamponade of the percutaneous renal tract and conserves renal access for a possible second – look PCNL.[3]

However, the need for placing a nephrostomy tube has been questioned by several authors since 1997. Many reports have confirmed the safety and efficacy of tubeless PCNL, and verified the benefits of a lower analgesic administration and earlier hospital discharge with no increase in morbidity Therefore, this modification in technique allows earlier discharge from the hospital, reduction in postoperative pain, and more rapid recovery.[4]Nephrostomy tube which is used in conventional standard PCNL has its own advantage to protect the kidney. However, there are numerous studies claiming the benefit of Tubeless PCNL over standard PCNL on the basis of

efficiency and. Safety. However findings from HamzaIchaoui et al[5] had not significantly benefited to tubeless PCNL group when compared to standard PCNL group. Moreover post operative infection was significantly higher in tubeless PCNL than standard PCNL. Moreover, study of Ahmed Sebaey[1] had found that operation time, hospital stay and leakage were not significantly different between PCNL and tubeless PCNL groups. Therefore, further studies is still needed to establish that tubeless PCNL or standard PCNL procedures to be conducted for safe and effective treatment of renal stone through PCNL.

Till now there is no any study comparing between Tubeless PCNL and standard PCNL in this Mid- Western region of Nepal. Therefore, this study aims to compare between tubeless PCNL and standard PCNL procedures for treating renal stone in Urology Department of Nepalgunj Medical College, Kohalpur, Banke, Nepal.

METHODS

This is a Prospective Hospital based study. Data of patient who underwent standard PCNL and tubeless PCNL were collected from Nepalgunj Medical College, Department of Urology, Kohalpur from June 2017 to April 2020. Information about patients regarding hospital stay, postoperative pain, operation time, leakage, fever, bleeding and urinary infection in patient were being collected.

Preoperative evaluation:

Patient with a single renal pelvis stone of size greater than 20 mm × 10 mm with any age and sex were included in this study. Patient with uncorrected coagulopathy, active untreated UTI, pregnancy, and multiple stone were excluded in the study. Ultrasonography of abdomen and pelvis, kidney-ureter-bladder (KUB) X-ray and intravenous urogram (IVU) and urine examinations were performed.

Grouping and treatment total 153 patients under inclusion criteria were divided into two groups. In group 1 there were 75 patients and in group 2 there were 78 patients. Group1 was allocated to patients who were being treated under standard PCNL procedure while Group 2 was allocated for patients who were being treated under Tubeless PCNL procedure.[5,6]

Operative techniques:

PCNL: A standard PCNL was performed in prone position under spinal anesthesia. Retrograde pyelography (RGP) with 76 % urograffin was performed to opacify the renal collecting system after inserting ureteric catheter 6 french (fr) in lithotomy position then patient turned to prone position. Lower or mid calyceal puncture was made with needle 17.5 g under c-arm fluoroscopy at 30^0angle. Guide wire placed, over which tract was dilated with Teflon fascial and metal sequential dilators up to 28 fr and 30 fr Amplatz sheath placed. After visualizing stone through nephroscope, stone fragmented with pneumatic lithotripter and took it out. Stone clearance checked by fluoroscopy. At the end of procedure double j stent placed inside the urinary system along with 28 fr nephrostomy tube in Group I. But In Group II, procedure completed only by placing D.J. stent and suturing the skin without placing Nephostomy tube.

Post operative treatment:

On the first day following surgery, Injection ketorolac 30 mg IV TDS was introduced for both group and then switched over to oral analgesic tablet Mefanemic acid from next day till pain subsides.

The primary end point of this study are post operative analgesia requirements, length of hospitalization, operation time and post-operative complications (fever, leakage and infection). These indicators were compared between the two groups.

Operation time was considered as duration (in minutes) taken for actual procedure to remove pelvis renal stone: starting from kidney puncture to removal of nephroscope.

Hospitalization duration is defined as the period which started from the first postoperative day to the day that patients got discharged from the hospital.

Post-operative complications were considered as the occurrence of wound infection, leakage of urine after removal of nephrostomy tube and fever.

Statistical analysis

Data analysis is performed with the program statistical package for social sciences (SPSS version 17.0). Quantitative variables such as age, operation time, length of hospitalization, dose of analgesic, were expressed as mean ± Standard deviation whereas the qualitative variables such as sex, operative complications were presented as frequency and percentage. For the parametric test of two independent group data, Independent t-test is use, whereas, for non-parametric test for two independent group data, Mann-Whitney U test was used. A p-value less than 0.05 was considered statistically significant.[7]

RESULTS

Baseline characteristics of two categorized groups of patients with respect to sex, age and average stone size were statistically same as shown in Table I (P>0.05).

Variables	Group I	Group II	p-value
Sex (Male: Female)	45:30	43:35	0.545
Age (years)	47.42±10.54	48.708±10.09	0.614
Stone (mm)	51.07±13.25	54.21 ±16.80	0.894

Table I : Baseline characteristics of the patients in Group I (standard PCNL) and Group II (tubeless PCNL)

A p-value less than 0.05 was considered statistically significant

There were no statistically significant differences between the Standard PCNL and Tubeless PCNL groups for mean operative time. The mean (SD) dose of postoperative analgesia was significantly higher in the Standard PCNL group compared with the Tubeless PCNL group, at 2981.33±572 versus 889.13+172 mg, respectively. The Hospital stay (days) was 100.68±17.38 in the STD PCNL group versus 34.64±6.9in Tubeless PCNL group, this difference was statistically significant. There was statistically significant differences between the Standard PCNL and Tubeless PCNL groups for leakage but no statistically significant differencesbetween infection and bleeding between the groups.

S.no	Variables	Group 1 (Mean± SD)	Group 2 (Mean± SD)	p- value
1	Operation time (min)	60.84±4.28	56.769±4.77	0.1
2	Post operative analgesic (mg)	2981.33±572	889.13±172	<0.001
3	Hospital stay (days)	100.68±17.38	34.64±6.9	<0.001

Table II : Comparison of operation time, post operative analgesic, hospital stay between Group II (standard PCNL) and Group II (tubeless PCNL)

A p-value less than 0.05 was considered statistically significant.

S.no	Variables	Group 1 n (%)	Group 2 n (%)	p-value
1	Leakage	29 (38.60)	Absent	<0.001
2	Infection	14 (18)	11 (14)	0.449
3	Bleeding	5 (6.6)	4 (5.1)	0.689

Table III : Comparison of the rate of post-operative complications (leakage, infection, bleeding) between Group I (standard PCNL) and Group II (tubeless PCNL)

DISCUSSION

Since 1980s, PCNL has been applied in the management of large renal stones due to its lower morbidity and hospital stay in comparison to open surgery. The placement of a nephrostomy tube is considered to be standard option in PCNL to draining the kidney, avoiding urine extravasation, plugging the access, and facilitating a secondary nephrostomy procedure required. However, the tube can prolong hospitalization period, cause discomfort and pain to patient. Therefore a urologist needs to improve this procedure.[4] This study aimed to compare tubeless PCNL and standard PCNL in patients with kidney stones. Efficacy (hospital stay time, operative time) and safety (postoperative pain and analgesia requirement, postoperative fever, infection, urine leakage) were being explored.

The present study has revealedoperation time was not significantly lower in the tubeless PCNL group compared with the standard PCNL group. This findings has been supported by the study of the study of WahibIsc.[6] However, the finding of this study is not supported by the study of H.Yuan et al[8] and A Tyagi et al.[9] The mean hospitalization time in the tubeless PCNL group was significantly lower compared with the standard PCNL group. Similarly previous studies reported that the mean hospitalization time was significantly lower in the tubeless PCNL group in comparison with standard and tubeless PCNL technique.[6,8-12] The outcome was due to decreased pain, irritation and avoiding insertion of a nephrostomy and ureteral catheter.However the study of HamzaIchot et al.[5] does not support the finding of our study.

The mean analgesia requirements for Group I was significantly more compared with Group II.The finding is persistent with the study of Suresh Bhat et al. [11], Agrawal MS et al.[12], Zhong-Jun [13] and Mustafa Okan Istanbul luoglu et al.[14] However the study of HamzaIchaoui[5]$_d$oes not support the outcome of our study.

The incidence of urinary leakage form the nephrostomy site was significantly less for the tubeless group compared with the standard PCNL. This findings has been supported by the study of the study of Yuan. H[8], Agrawal MS(2008)[13], Agrawal MS (2014)[11], Zhong-Jun Chen.[12] However the finding of this study was not supported by the study of Ahmed Sebaey[1], Suresh B et al.[10]The difference in urinary infection between two groups was no statistically significant and this result is further supported by study of Agrawal MS(2008).[13] However according to study performed by HamzaIchaoui[5] post operative infection was significantly higher in tubeless PCNL than standard PCNL.[5] Furthermore, the difference in fever in two groups was also not statistically significantly different and this resultof this study is further supported by study of Yuan. H[8], Suresh B et al [10], and Zhong-Jun Chen .[12] Likewise, the difference in bleeding in two groups was also not statistically significant and this result is further supported by study of Agrawal MS(2008)[13], Suresh B et al [10], A Tyagi et al.[9]

LIMITATION

Major limitation of this study is, that it is non randomized and non-blinded study, which may have led to many biases. One of that is selection bias. Another limitation is the requirement of rescue analgesics is not analyzed in the post-operative period.

CONCLUSION

Our study showed that Tubeless PCNL reduces postoperative urinary leakage, local pain related to the nephrostomy tube, hospital stay and dose of analgesic. Therefore PCNL can be substituted by tubeless PCNL for the removal of kidney stone for more safe and efficient treatment of renal stone. It would be better if randomized blinded study could be carried out in the future to avoid the biases in the results.

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RESEARCH ARTICLE

Mid-Trimester Scan is better for Detecting Congenital Anomalies: An Experience from Dhulikhel Hospital

Tamrakar SR [1], Shrestha R[2]

ABSTRACT

Introduction: Ultrasound is a valuable diagnostic tool for detecting the congenital anomalies in the fetus. Congenital anomalies are detected in 14% of new born. Major anomalies are detected in 2 to 5% of new born. This accounts for 20 % to 30% of total perinatal deaths. Prenatal diagnosis provides variety of management options for the pregnant women ranging from termination of pregnancy, elective delivery or intrauterine manipulation of the anomalies. **Aims:** To determine the prevalence of the fetal congenital anomalies at 20- 24 weeks ultrasonography. **Methods:** This is prospective study conducted at Dhulikhel Hospital. Pregnant ladies with singleton pregnancy at 20 to 24 weeks were enrolled for transabdominal ultrasound for detecting congenital anomalies. **Results:** Of 1027 pregnant ladies screened, anomalies were detected in 31 ladies during mid trimester ultrasound. The overall prevalence of congenital anomalies detected in our study is 3.02% (31 cases), which has sensitivity of 87.8%, specificity of 99.7% and positive predictive values of 93.5%. In our study, mean gestational age during scan was 21^{+5} weeks of gestation. And 13 pregnant ladies pregnancies were terminated between 20-24 weeks for having major congenital anomaly in fetus. **Conclusion:** Mid trimester ultrasonography is a valuable method for pregnant ladies to detect the congenital anomalies in fetus. When major anomalies are detected, timely termination of pregnancy have saved the cost and tragedy of losing viable fetus.

***Keywords*: Congenital anomalies, Mid trimester, Transabdominal ultrasound**

Authors:

1. Prof. Dr. Suman Raj Tamrakar
2. Dr. Rubina Shrestha

[1]Department of Obstetrics and Gynecology, Dhulikhel Hospital, Kathamandu University of School Medical Sciences, Dhulikhel

[2]Department of Obstetrics and Gynecology, College of Medical Sciences, Bharatpur

Address for Correspondence:

Prof. Dr. Suman Raj Tamrakar
Department of Obstetrics and Gynaecology
Dhulikhel Hospital, Kathamandu University of School Medical Sciences, Dhulikhel
E-mail: drsuman3947@gmail.com

INTRODUCTION

The clinical application of ultrasound in medical diagnosis was first introduced and popularized by Sir Ian Donald in 1958 by diagnosing a large ovarian cyst. A few years later, he published his study of fetal head measurement.[1] Further evolution has led the use of ultrasound for different purposes diagnostic as well as therapeutic in surgery, obstetrics and gynecology, medicine etc. In 1972 Campbell first reported the prenatal diagnosis of anencephaly.[2] Every pregnant woman desires to have healthy baby. The detection, treatment and prevention of congenital anomalies are considered important goals of antenatal care. One of the routine antenatal investigations, ultrasound has been a valuable diagnostic tool and screening tool for practicing obstetrician. Obstetric ultrasound employ frequencies of 2 to 15 MHZ Abdominal transducers use a frequency of 2 to 6.5 MHZ and transvaginal transducer use frequencies of 5 to 15 MHZ. Obstetric ultrasound uses largely abdominal approach. Information may be displayed as a sagittal, coronal, axial or oblique section. Ultrasound has been a valuable diagnostic tool for determining early pregnancy, gestation age, evaluation of fetal growth and well-being. There are specific indications for ultrasonography (USG) in first, second and third trimester (Table I).[3] Special benefits of routine ultrasound examination at mid-trimester has been the detection of congenital anomalies which was confirmed by the Helsinki trial.[4] Eik-Nes et al. concluded that screening for congenital anomalies decreased unnecessary inductions and reduced perinatal morbidity and mortality.[5]

First trimester	Second Trimester/ Third trimester
• Confirm an intrauterine pregnancy • Estimate the gestational age • Confirm the cardiac activity • Diagnose the multi fetal gestation including amnionicity and chorionicity. • Assessment of embryonic/fetal anatomy appropriate for the first trimester such as anencephaly. • Evaluate the maternal pelvic masses or uterine abnormalities. • Measure nuchal translucency as a part of screening for fetal aneuploidy.	• Gestational age estimation • Fetal-growth evaluation • Significant uterine size/clinical date discrepancy • Diagnose multifetal gestation • Fetal anatomical evaluation and anomaly screening. • Measurement of cervical length • Placental localization • Confirmation of fetal presentation • Confirmation of hydramnios or oligohydramnios • Fetal well-being evaluation • Suspected fetal death
Adapted from the American Institute of Ultrasound in Medicine, 2013a.	

Table I : Trimester-wise obstetric ultrasound indication

Congenital anomalies can be defined as structural or functional anomalies (e.g. metabolic disorders) that occur during intrauterine life and can be identified prenatally, at birth or later in life.[6] The congenital anomalies encompass genetic disorders, chromosomal anomalies and dimorphic developmental anomalies in isolation or in combination. There are various screening techniques, noninvasive technique and invasive technique for prenatal diagnosis of congenital anomalies. Detection of structural anomalies by the obstetric ultrasound is one of the non-invasive techniques. Technical advances in ultrasound have helped in easy detection of structural anomalies since few decades.[7]

Congenital malformations are divided into major and minor categories. The RADIUS (Routine Antenatal Diagnostic Imaging with Ultrasound) study defined major anomaly as birth defects that required medical or surgical intervention and/ or had a significant impact from a functional or cosmetic perspective.[8] And minor anomalies are the features that vary from those seen in the normal population but that, in and of themselves, do not cause increased morbidity. Prenatal detection of congenital anomalies may characteristically alter obstetric management. Antenatal diagnosis of significant fetal anomalies offers a variety of options for the pregnant women ranging from termination of pregnancy to elective delivery at a center, equipped to perform highly specialized neonatal surgical procedure.[9]

METHODS

This prospective study was conducted in the Department of Obstetrics and Gynaecology of Dhulikhel Hospital from January 2015 to August 2016. This is a tertiary level hospital where more than 3500 deliveries take place annually. In this study, primigravida ladies at 20- 24 weeks are enrolled for transabdominal ultrasound for detecting congenital anomalies. Exclusion criteria include multigravida, multifetal gestation, maternal diabetes and maternal obesity.

Altogether 3998 pregnant ladies came for antenatal visit during the study period. Among them 1648 (41.2%) were primigravida. Out of 1648 primigravida pregnant ladies, 1242 met all the inclusion criteria. All these ladies were counselled and informed consents were taken. Out of 1242 enrolled pregnant ladies, 215 patients lost the follow-up. Hence, rest 1027 primigravida ladies were included in this study.

Ultrasound scan are carried out by professional Radiologist. TAS was performed between 20 - 24 weeks of gestation. It is the ideal time for the sonographic assessment of fetal anatomy as there is an optimal balance between the amount of amniotic fluid volume and developmental stage of the fetal organs. It represents the limit of fetal viability.

Ethical clearance was taken from the hospital research committee (IRC-KUSMS#41/15). All data were entered in excel sheet and analyzed by SPSS 16 packages using appropriate statistical tools like frequency, percentage, means, p value, Chi square test.

RESULTS

In this prospective clinical study, 1027 pregnant ladies were enrolled to find out the prevalence of congenital anomalies by mid trimester scan.

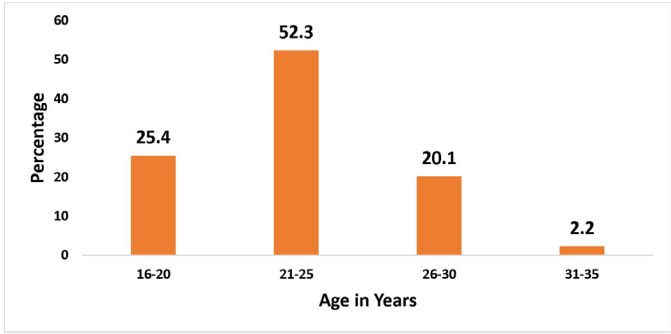

Figure 1 : Age distribution of study population

In this study, the youngest lady was 16 years old and the oldest was 35 years old. The mean age was 22.92 ± 3.45. More than half of the pregnant ladies were of age group between 21-25 years.

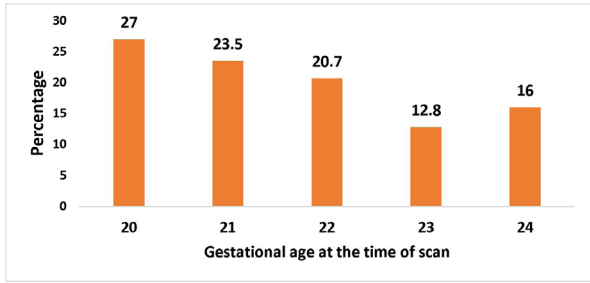

Figure 2 : Gestational age at the time of scan

In this study mean gestational age during scan was 21^{+5} weeks of gestation.

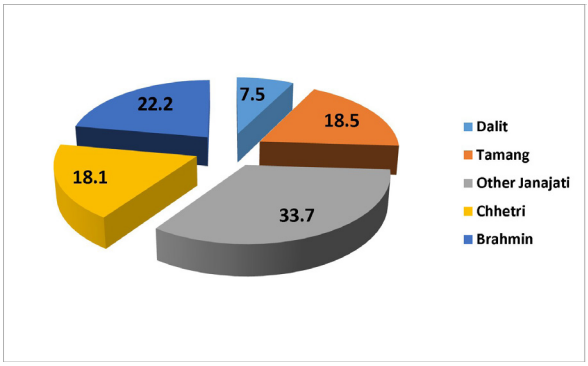

Figure 3 : Ethnicity of study population (percentage)

In this study most of the ladies belong to Janajati ethnicity and among Janajati, Newar (n=263, 25.6%) were maximum.

Congenital anomaly	Frequency	Percentage	Termination
Anencephaly	5	16.1	Yes
Non-immune hydrops fetalis	3	9.7	Yes
Cleft lip and cleft palate	4	12.9	No
Fetal ventriculomegaly non communicating	1	3.2	Yes
Prominent ventricle	2	6.4	No
Choroid plexus cyst	4	12.9	No
Reduced size of cisterna magna	1	3.2	No
Aqueductal stenosis	1	3.2	Yes
Echogenic focus in left ventricle	2	6.4	No
Prominent cisterna magna	1	3.2	No
Multicystic dysplastic kidney	1	3.2	Yes
Dilated fetal renal pelvis	1	3.2	No
Posterior urethral valve	1	3.2	No
Pelvic ureteric obstruction	1	3.2	No
Dilated bowel loops with echogenic bowel	1	3.2	No
Choledochal cyst	1	3.2	Yes
Dandy walker malformation	1	3.2	Yes
Total	**31**		

Table II : Congenital anomalies detected during mid-trimester screening (n=31)

Out of total 1027 pregnant ladies scanned during mid-trimester screening, congenital anomalies were detected in 3.02% (31). Total of 13 (1.2%) were detected to have major anomalies and rest 18 (1.8%) were detected with minor anomalies. Major anomalies detected were anencephaly (5), non-immune hydrops (3), and each case of aqueductal stenosis, choledochal cyst, Dandy Walker malformation, multicystic dysplastic kidney and non-communicating ventriculomegaly. All the pregnant ladies with major congenital anomalies underwent termination of pregnancy after proper counseling. Rest were detected with minor anomalies like cleft lip and cleft palate (4), prominent ventricle (2), choroid plexus cyst (4), echogenic focus in left ventricle (2) and each case of reduced cisterna magna, dilated fetal renal pelvis, posterior urethral valve, pelvic ureteric obstruction and dilated bowel loops with echogenic bowel.

Out of 1027 cases, majority of pregnant ladies, 634 delivered at term, 160 had preterm delivery and 233 had post-dated delivery. Of them 20 pregnant ladies delivered before 28 weeks, 13 pregnant ladies pregnancies were terminated between 20-24 weeks for having major congenital anomaly in fetus.

DISCUSSION

Congenital anomalies were detected in 14% of new born.[10] Major anomalies are detected in 2-5% of new born. This accounts for 20% to 30% of total perinatal deaths.[11,12] In 1994, a secondary analysis of the RADIUS study[13] reported that only 17% of anomalous fetuses were detected by ultrasonography performed between 15 and 22 weeks in a low-risk population. Anomaly detection rates in other published series ranges from 21% to 84%.[4,14-19] Van Dorsten JP et al. conducted ultrasonography scanning at 15-22 weeks of 2031 pregnant ladies, found that 47 fetuses (2.3%) had a major anomaly, 8.6% in the indicated group and 0.68% in the screening group (p = 0.001). The sensitivity for detecting the anomalous fetus was 75% overall, 89.7% in the indicated group and 47.6% in the screening group (p = 0.001).[20]

In Nepal, the death rate due to congenital anomalies per year is 6.56 per 100000.[21] The incidence of congenital anomalies among newborn during one year at Maternity Hospital was 0.36% among the total live births which account for 9.7% of perinatal deaths, 11.06% of early neonatal death and 7.9% of still births.[22] A review study conducted at TU Teaching Hospital showed about 1.3% of babies having congenital malformation was responsible for about 15% of the perinatal mortality.[23] In our institute, congenital anomalies were detected in 3.02% (31) (Table II). Certain studies have repeatedly shown that more anomalies are diagnosed if the scan is done after 18 weeks. Though a screening of congenital anomalies is carried out in the 2nd trimester, usually between the 18th and 21st weeks of gestation, the ideal time for the sonographic assessment of fetal anatomy should be at 24- 26 weeks gestation, to give an optimal balance between the amount of amniotic fluid and the volume and developmental stage of the fetal organs.[24] The Royal College of Obstetrics and Gynaecologists (RCOG) recommends that the second trimester fetal anatomical scan be performed between 20-24 weeks as most of the fetal anatomic parts are developed by this gestational age. This also helps in timely decision whether to continue or terminate the pregnancy when fetal anomaly is detected. The knowledge of fetal anatomy and its change over the antenatal period must be remembered in diagnosing malformation. For examples, the bowel returns to the fetal abdominal cavity at 10- 12 weeks. Therefore diagnosis of an omphalocele before tenth week is

not logical. Major abnormalities of the fetal head, abdominal wall and urinary tract, and of the umbilical cord and placenta, can be reliably detected at 10- 11 weeks of gestation. Detection of other anomalies such as spina bifida, diaphragmatic hernia or heart defects is limited before 13 weeks of gestation. Similarly in infantile polycystic kidney disease, the kidney and urinary bladder may appear completely normal up to 24 weeks of gestation. A diagnosis of agyria is unjustified before 20-24 week as there is relative absence of cerebral sulci before mid-trimester.[24]

Weiszl B et al. found that the detection rate of fetal anomalies at 11- 14 weeks is 44% in comparison to 74% by the mid-pregnancy scan.[25] The study by Hegge FN et al. revealed that an indication based system for ultrasound referral failed to detect any abnormal fetuses prior to 23 weeks of gestation.[26] Chitty et al. retrospectively reviewed 8432 unselected pregnancies in the second trimester. There were 130 fetuses found to have an abnormality at birth or after termination of pregnancy. Ultrasound was done in 125 pregnant ladies in the second trimester. Of these, 93 cases were diagnosed (sensitivity 74.4%; specificity 99.9 %). In 52 cases, the pregnancy was terminated after a severe anomaly was identified.[16] In our study, mean gestational age during scan was 21^{+5} weeks of gestation. And 13 pregnant ladies were terminated between 20-24 weeks for having major congenital anomaly in fetus. Prenatal detection of congenital anomalies may characteristically alter obstetric management. Antenatal diagnosis of significant fetal anomalies offers a variety of options for the pregnant women ranging from termination of pregnancy or elective delivery at a center equipped to perform highly specialized neonatal surgical procedure. Termination of pregnancy is done keeping in mind the abortion law. At the ground of Nepal abortion law if the fetus has severely debilitating or fatal deformity, pregnancy can be terminated at any gestation. It will help the couple to protect against psychological and mental tragedy and cost associated with caring of child with congenital anomalies. Four fetus had anomalies that probably went undetected by USG at 20-24 weeks. Two fetus had isolated ventricular septal defect and one with multiple cardiac defect and one fetus with osteogenesis imperfecta which was diagnosed later at 32 weeks. False-positive diagnosis was less in this study. In this study a combination of ultrasonographically detected anomalies and delivery detected anomalies yields an overall congenital anomaly prevalence of 3.4% in low risk pregnant ladies. There were two anomalies that resolved by the time of delivery, one case of reduced size of cisterna magna and one case of dilated fetal renal pelvis. Both of these neonates were found to be normal at birth.

In a study done by Van Dorsten JP et al.[20] in 2031 pregnant ladies the overall prevalence of congenital anomaly in screening group was 1.3% (n =21) in screening group and 2.95% (n=39) in the indicated group. For the pregnant ladies at risk of anomalies (indicated group), the accuracy of anomaly detection is extremely high compared to low risk population. The prevalence of ultrasonographically detected anomalies in our study is quiet higher even in low risk pregnant ladies, as our hospital is the tertiary center were large number of cases are referred for evaluation. The Helsinki trial showed a difference in a detection rates for anomalies (36% vs 77%) when non- tertiary center with tertiary centers.[4] According to our study ultrasonographic screening for detecting congenital anomalies in fetus has sensitivity of 87.8% and specificity of 99.7% with high positive predictive value (PPV) of 93.5% which is quiet similar to the study done by Magriples U and Copel JA[27] with sensitivity, specificity and PPV of 71.4%, 99.4% and 80% respectively. It is quiet comparable to other studies by Van Dorsten JP[20] and Chitty LS.[16] Routine anomaly screening improves perinatal outcome, most directly through termination of pregnancy for major anomalies and selective delivery at tertiary centers. In this study, all the pregnant ladies who were detected to have major congenital anomalies went for termination of pregnancy after proper counselling. Termination in case of congenital anomalies is understandable in our setting because of inability of parents to bear the cost and burden associated with raising the anomalous baby.

LIMITATION

We have faced difficulty in providing appointment for detail evaluation of anomalies and it's documentation in general Radiology Department. Clients would have been benefitted and comforted more in dedicated USG room for anomalies screening purpose. And we couldn't perform the autopsy of all the expelled fetuses with major anomalies due to absence of national guideline and unwillingness of the parents.

CONCLUSION

Hence we conclude that the prevalence of congenital anomalies in mid-trimester screening in our low risk population is 3.02 %, which has sensitivity of 87.8% and specificity of 99.7%. When major anomalies are detected, timely termination of pregnancy have saved the cost and tragedy of losing viable fetus. Longitudinal studies are required to elicit the difference in prevalence between indicated group and low risk population.

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Caesarean Section in Confirmed COVID-19 Patient at Nepalgunj Medical College: Case Report

Sinha K[1], Kushwaha A[1], Adhikari H[1]

ABSTRACT

An outbreak of novel coronavirus pneumonia occurred worldwide since December 2019, which had been named COVID-19 subsequently. It is extremely transmissive that infection in pregnant women were unavoidable. The delivery process will produce large amount of contaminated media, leaving a challenge for medical personnel to ensure both the safety of the mother and infant and good self-protection. Here, we report a 27 year woman had reverse transcription polymerase chain reaction-confirmed COVID-19 at 37 weeks 2 days of gestation. An emergency caesarean section at 38 weeks 2 days of gestation under spinal anaesthesia was performed for oligohydramnios with scar tenderness with strict protection for all personnel.

Keywords: **Covid-19, Pregnancy, SARS-cov-2**

Authors:

1. Dr. Kavita Sinha
2. Dr. Amrendra Kushwaha
3. Dr. Homnath Adhikari

[1] Department of Obstetrics & Gynaecology, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke

Address for Correspondence:

Dr. Kavita Sinha
Department of Obstetrics & Gynaecology
Nepalgunj Medical College and Teaching Hospital
Kohalpur, Banke, Nepal
Email: ksinhapandey@gmail.com

INTRODUCTION

Coronavirus diseases 2019 (COVID-19) is a new pathology declared a public health emergency by the World Health organization, which can have negative consequences for pregnant women and their newborns. In early December 2019, a cluster of cases of pneumonia of a newly identified corona virus was noted in Wuhan in china.[1]The corona virus was initially termed 2019-ncovV and subsequently SARS-COV-2, producing a diseases that had been termed COVID -19.[2] SARS-COV-2 can be transmitted through small droplets from normal breathing, coughing and sneezing, and by aerosol or fluid from human secretion or discharges.[3,4,5] Patients of mild COVID-19 may present with fever, fatigue, dry cough, but severe infection may progress rapidly to acute respiratory distress syndrome, septic shock, intractable acidosis and coagulopathy.[6]Pregnant women infected with SARS-COV-2 were at high risk of developing severe pneumonia, heart failure and other complications which could be life threatening leading to death in many cases. Here, we report a COVID-19-confirmed case of pregnancy with oligohydramnios and previous caesarean section. Ethical clearance was obtained from Institutional review committee, Nepalgunj Medical College.

CASE REPORT

This patient consented to publication of the case and signed written informed consent. A 27years, Gravida 3, Para 2 women(145cm, 45kg) with previous caesarean section who had Reverse transcription polymerase chain reaction (RT-PCR) confirmed COVID-19 at 37 weeks 2 days of gestation. She was at quarantine as had a travel history to endemic area. Her PCR was positive on 22nd day after returning from endemic region. She was referred as per the government guidelines to our hospital from a hospital located 250km away for the possible need of caesarean section. Nepalgunj Medical College and Teaching Hospital has been designed as level III tertiary hospital by government of Nepal, for serving the COVID positive patients requiring multispecialty services.

On examination her general condition was fair, uterus 34 weeks size, longitudinal lie, cephalic presentation, scar tenderness present, FHR 140 beats per minute; per vaginal examination showed Os parous, uneffaced, soft, central with show present. The laboratory test results showed a leukocyte count 9,300 cells/mm^3 with Neutrophil 76% and lymphocyte 21%. Ultrasound examination showed placenta grade III with amniotic fluid index 5.Hence, planned for caesarean section.

The patient wearing a surgical facemask and lying in stretcher was sent through a designated channel to Negative pressure operating room. All participants equipped with personnel protective equipment performed an emergency section at 38weeks 2 days of gestation under spinal anaesthesia. The caesarean section was performed uneventfully. The neonate was 2400 g, with Apgar score at 1 and 5 min of 6 and 8, respectively.

The patient referred back to the isolated postoperative ward accompanied by the attending anaesthesiologist after surgery. Both of them were discharged smoothly at day 7 postoperatively after SARS-CoV-2 detection of maternal and neonatal nasopharyngeal swab specimen turned negative.

All the surgical participants were directed to quarantine area following a planned route after the caesarean section. RT-PCR of all the involved health care workers taken on 7th day after the last exposure were negative.

DISCUSSION

We performed an emergency caesarean section in a patient with a highly infectious respiratory viral pathogenic disease. The multidisciplinary team worked together to formulate detailed plans and made sufficient preparations, which lead an uneventful outcome of the mother, the newborn, and all heath care workers. However, there are few reports available for reference on exact anaesthesia design for pregnant women confirmed with COVID-19.[7]

COVID-19 spreads very rapidly. It was declared a global pandemic by WHO, which neither previous SARS nor MERS could be considered.[8] It might transmit through droplets, contact and respiratory aerosols within <6 feet range during the caesarean section.[9]

CONCLUSION

Confronted with a caesarean section which owns a high risk of infection, a thorough anaesthesia plan, and a multidisciplinary cooperation can improve the safety of mothers and infants, and reduce the risk of infection of medical staff, conducive to epidemic prevention and control.

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Bilateral Blindness Due to Left Fronto-Temporal Lobe Glioblastoma Multiforme

Thapa BB[1], Neupane J[2], Moktan S[3]

ABSTRACT

Introduction: Glioblastoma multiforme is the most common primary malignant brain tumor, with a very poor prognosis. Direct compression of any structure in the visual pathway or chronic papilloedema is the cause of loss of vision in these patients. **Case Report:** 30 years old male from Dailekh was brought by his elder brother with the complaint of complete vision loss in both eyes for 45 days. He also had hearing difficulty on right side, headache, right sided weakness and abnormal body movement. His Visual acuity was no perception of Light in both eyes. Pupil was mid-dilated and not reacting to light. Fundus examination revealed bilateral Pallid disc edema. MRI brain revealed left fronto-temporal GBM compressing optic chiasm. Neurosurgical consultation was obtained and counseling was done regarding disease and its treatment. Due to poor prognosis and poverty patient choose palliative conservative treatment. **Conclusion**: This case highlights the possibility of bilateral Blindness in unilateral GBM. GBM has very poor outcome even after treatment.

***Keywords*:** Blindness, Glioblastoma multiforme, Magnetic resonance imaging

1. Dr. Bikram Bahadur Thapa
2. Dr. Joshan Neupane
3. Dr. Suman Moktan

[1]Department of Ophthalmology, Nepalgunj Medical College and Teaching Hospital, Nepalgunj, Banke
[2]Department of Neuosurgery, Nepalgunj Medical College and Teaching Hospital, Nepalgunj, Banke
[3]Nepalgunj Medical College and Teaching Hospital, Nepalgunj, Banke

Address for Correspondance:

Dr. Bikram Bahadur Thapa
Department Of Ophthalmology
Nepalgunj Medical College and Teaching Hospital
Nepalgunj, Banke, Nepal
Email: drbbthapa@gmail.com

INTRODUCTION

Glioblastoma multiforme (GBM) is the most common and lethal malignant primary brain tumor, with an incidence of 3.19 /100,000 person years and remarkably poor prognosis showing a 5-year survival rate of 4-5%.[1] GBM occurs most commonly in sub cortical white matter of temporal, parietal, frontal and occipital lobe. Combined fronto-temporal is typical location whereas brainstem, cerebellum and spinal cord are less common site.[2] Intra-cranial Space occupying lesions (ICSOL) may be responsible for a range of neuro-ophthalmic deficits including visual problems, optic disc pallor or oedema, and oculomotor disturbances. Lesions may either affect vision directly by compression or infiltration anywhere along the visual pathways or visual cortex or indirectly by prolonged raised intracranial pressure (ICP) causing papilloedema.[3]

The common causes of bilateral blindness are cataract, pathological myopia, age related macular degeneration, glaucoma, optic neuropathy, diabetic retinopathy and corneal opacity.[4]

Bilateral occipital lobe ischemia or infarction or hemorrhage**,** bilateral occipital lobe trauma, chronic Idiopathic Intracranial Hypertension, chronic papilloedema, chiasmal compression, cavernous sinus thrombosis and methyl alcohol poisoning etc are less common causes of bilateral blindness.[4-6] The cause of bilateral blindness in GBM is either direct chiasmal compression or chronic papilloedema. There are reports of partial blindness from GBM at different stage of treatment from different part of world[1-3] but in this case we report bilateral complete blindness as a presentation of GBM in a Nepalese patient.

CASE REPORT

A 30 years old male patient from Dailekh District was brought by his elder brother in ophthalmology outpatient department of Nepalgunj Medical College, Nepalgunj with the complaint of complete vision loss in both eyes for 45 days. It was painless and progressive in natures. He had a history of hearing difficulty on right side for 3 months. He experienced multiple episodes of headache for 1 year, which was gradual on onset, mild to moderate intensity, mostly in frontal region. He also had history of weakness in right side of body for 1 month. He had multiple episodes of abnormal body movement from last 15 months, which might be the initial symptom of the diseases but due to poverty and religious values he did not able to consult heath

care provider. In his village people believe abnormal body movement was caused by sin, effect of ghost and as effect of god on him. Thus, He was taken to Dhami and Jhakri for treatment for multiple times with the hope of recovery.

On ophthalmic evaluation his Visual acuity (VA) was no perception of light (NPL) in both eyes. Intraocular pressure (IOP) was 16 mmHg on Goldman applanation tonometer (GAT) in both eyes. Anterior segment evaluation including cornea and lens revealed no abnormalities. Both pupil were fixed and dilated not reacting to light. On fundus examination both optic discs were elevated with blurred margin, obliterated cup, disc hemorrhage, pallid color and dilated venules suggesting chronic papilloedema as seen in Disc photo (Figure **1a** and **1b**) which was also seen in MRI **(Figure 3)**. Rest of the fundus reveals no abnormality. Color vision and visual field test could not be performed.

Magnetic resonance Imaging (MRI) brain was done, which revealed heterogenous lesion of 90 × 70 × 65 mm in left cerebral hemisphere involving left fronto-temporal lobe, parietal lobe and left basal ganglia **(Figure 2a and 2b).** The lesion is also extending to suprasellar cistern with compressing optic chiasm and pituitary gland **(Figure 2c).** Lesion showed enhancement after intra-venous Gadolinium with cystic and necrotic changes. Mass effect evidenced by effacement of adjacent sulci and ipsilateral lateral ventricle with resultant midline shift (**Figure 2c**). Magnetic Resonance spectroscopy (MRS) of the lesion showed a raised choline peak with a depressed N-acetyl aspartate peak with reversed Hunter's angle confirming diagnosis of Glioblastoma Multiforme.

Pure tone audiometry (PTA) revealed total hearing loss in right side and mild sensori-neural hearing loss in left side **(Figure 4)**. Neurosurgical consultation was obtained. After detailed evaluation and explaining surgical outcome, need of postoperative care, cost of treatment and prognosis by consultant Neurosurgeon, patient denied surgical treatment and given Intracranial pressure(ICP) lowering agent and analgesics.

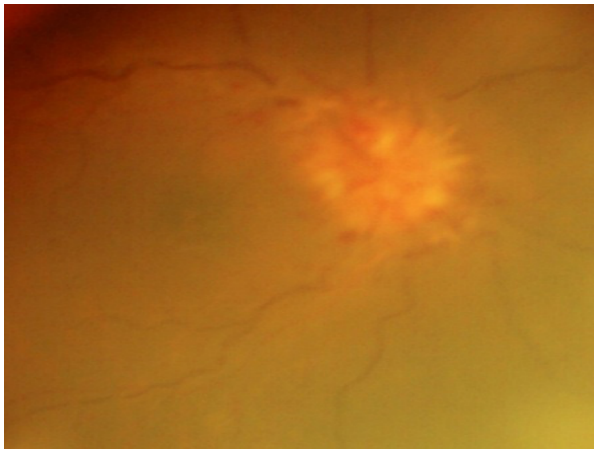
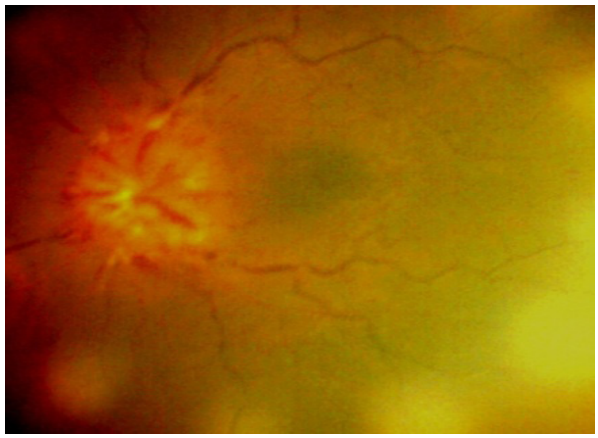


Figure 1a : Disc photo of right eye showing established chronic disc edema



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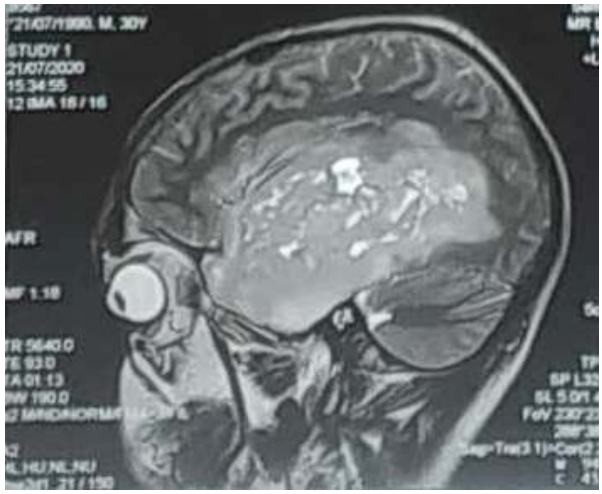

Figure 2a : Sagittal section of T2 –Weighted scan showing mass located in left fronto-temporal lobe with extension in parietal lobe and basal ganglia

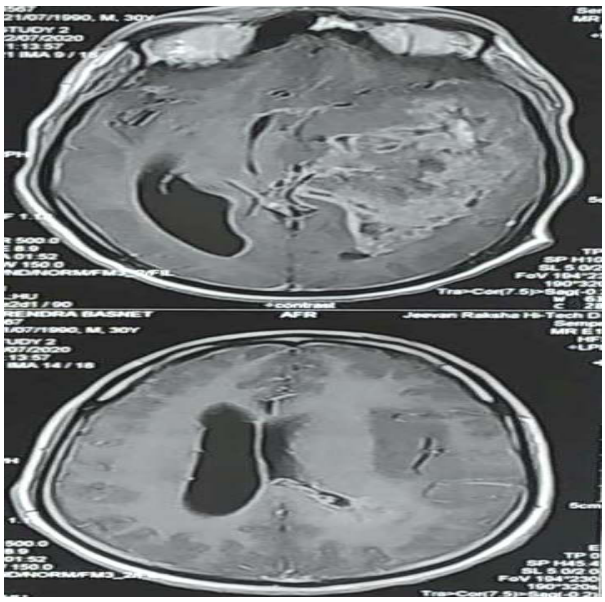

Figure 2b : Axial section of T1-W scan showing mass on left temporal lobe with midline shift, enlarged contra-lateral lateral ventricle and effacement of adjacent sulci

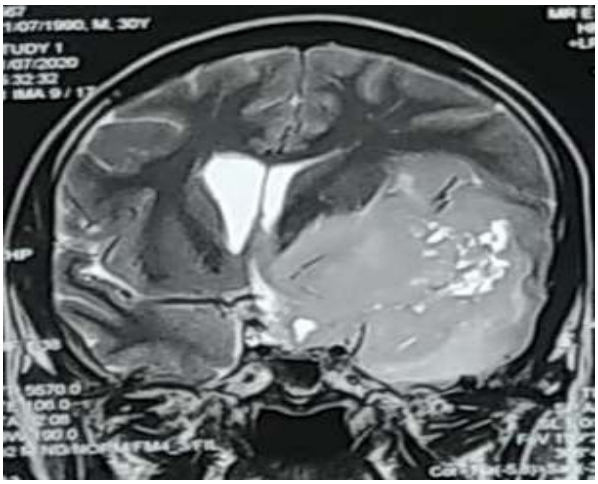

Figure 2c : Coronal section of T2-W scan showing heterogeneous mass in left fronto-temporal lobe compressing optic chiasm with midline shift and enlarged contra-lateral ventricle

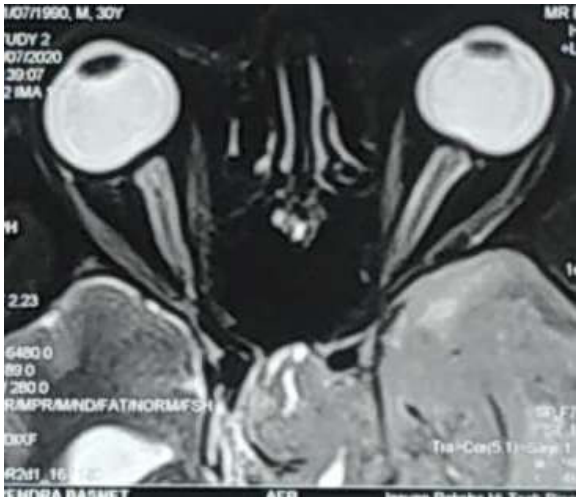

Figure 3 : T2 weighted MRI Axial scan showing enlarged perioptic subarachnoid space with thinned out optic nerve

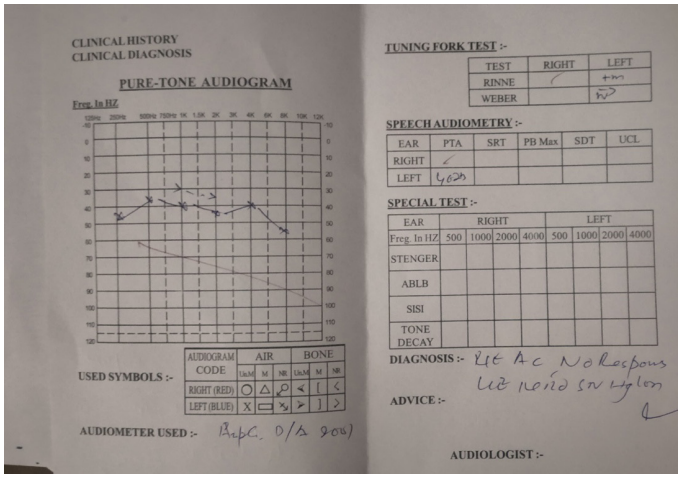

Figure 4 : Pure Tone Audiomety revealing total hearing loss in right side and mild sensorineural hearing loss in left side

DISCUSSION

Glioblastoma multiforme associated with symptoms due to mass effect and disturbance of local brain function. Visual problems are the neuro- ophthalmic deficits observed in these patients. Lesions may affect vision directly by compression or infiltration anywhere along the visual pathways or visual cortex or indirectly as a result of the optic atrophy caused by chronic papilloedema.[3] In the lesion of the anterior visual pathways and chronic papilloedema, the pupillary response to light is attenuated and the optic disc appears abnormal.

Delay in the presentation to the health care provider is a known problem in Nepal due to difficult geography, lack of transportation facility, poverty, and religious value, belief in local traditional healer including Dhami and Jhakri especially in Far-western and Midwestern Hills. People seek health service only when they need help of another person to carry out their basic daily activities. He neglected all problem because of hearing difficulty, weakness of body, occasional headache and occasional abnormal body movements.[8]This indicates that the most significant neurological deficit caused by his brain tumor was the complete loss of his sight as shown by Seth et al in his case report[2]. Thus strong and dedicated governmental promotional, preventive and curative health system is needed to fight against these problems. Direct compression of the optic chiasm need to be considered to account for the bilateral complete vision loss in this case as MRI showed chiasmal compression by tumor. An acute "spike" superimposed on his chronically raised ICP causing decompensation of the swollen optic disc can be another mechanism for visual loss in this case. This fact was also highlighted by Seth et al.[2]

Current treatments cannot cure GBM patients and help to extend their survival only. Surgical resection followed by radiotherapy and chemotherapy with temozolamide is the preferred treatment of GBM[1]. Intracranial pressure lowering agent like Acetazolamide, corticosteroids to reduce perilesional edema and analgesics to relieve pain are used in palliative care as done in this case.[1, 2] The median survival of the patient is around 15 months with the treatment. Counseling regarding these facts including nature of disease, treatment options, treatment outcomes and prognosis help patient and their family to make best cost effective and rational choice.

CONCLUSION

This case highlights the risk of irreversible visual loss in patients with brain tumors, when the lesion is compressing the visual pathways. In developing country like Nepal, patients present to the health care service once disease is advanced, thus awareness program should be increased up to each community and school. GBM is lethal brain tumor, having 5 year survival rate of 4-5%. So cost- effective approach and affective counseling is vital in its management.

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