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ORIGINAL ARTICLES

Phototherapy Induced Hypocalcaemia in Neonates with Jaundice

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ABSTRACT

Introduction: Neonatal hyperbilirubinemia is seen mainly in the first week of life and in many of the cases it is only in physiological range which requires no intervention. Approximately 5-10% of them have clinically significant jaundice that requires phototherapy and even exchange transfusion. Phototherapy can produce various adverse effects; hypocalcaemia is one of the lesser known effects. So, estimation of calcium levels before and after phototherapy should be done in neonates with jaundice. **Aims**: The aim of this study is to determine hypocalcaemia, in neonates receiving phototherapy, by measuring serum calcium levels. **Methods:** This cross sectional study was conducted, from February 2020 to August 2020, on 50 neonates admitted in Neonatal Intensive Care Unit of Nepalgunj Medical College, Kohalpur with unconjugated hyperbilirubinemia requiring phototherapy. Serum calcium levels were evaluated before and after phototherapy. Neonates were assessed for clinical features of hypocalcaemia i.e. jitteriness, irritability/ excitability and convulsions. Data were analyzed using SPSS version 25.P value <0.05 was taken as significant. **Results:** Frequency of hypocalcaemia after phototherapy was 26%. There was significant change in serum calcium levels before and after phototherapy ($p<0.01$). Among hypocalcaemic neonates, 56% were symptomatic; 38% developed jitteriness, 18% developed irritability / excitability and none of them developed convulsions. **Conclusion:** Neonates undergoing phototherapy are at increased risk for hypocalcaemia. Monitoring for hypocalcaemia and its complications should be considered. However, universal recommendation of calcium supplementation is yet to be established but seems reasonable.

***Keywords*:** Hypocalcaemia, Jaundice, Neonates, Phototherapy

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INTRODUCTION

Jaundice is a common cause of morbidity encountered in neonates, mainly in the first week of life. It is an utmost concern for physicians and source of anxiety for parents.[1] Jaundice in newborns occurs when the level of bilirubin rises more than 5-6 mg/dl. It is observed in 60% of term and 80% of preterm neonates.[2] In majority of cases, it is benign and no intervention is required. Approximately 5-10% of them have clinically significant jaundice that requires treatment.[3] High bilirubin level may be toxic to the developing central nervous system and may elicit neurological impairment.[4] Phototherapy is one of the modalities for management of hyperbilirubinemia in neonates which is convenient and readily available.[5] Phototherapy may lead to various complications including skin rashes, diarrhea, hyperthermia, dehydration, retinal degeneration, bronze baby syndrome especially in cholestatic jaundice, opening of patent ductus arteriosus in low birth weight neonates and hypocalcemia.[6]

Neonatal hypocalcaemia is defined as total serum calcium concentration < 7 mg/dl or ionized calcium concentration < 4mg/dl. Ionized calcium is crucial for many biochemical processes, including blood coagulation, neuromuscular excitability, and cellular enzymatic activities.[7] The overall prevalence of hypocalcaemia in neonates receiving phototherapy was 8.7% in full-term newborns.[1] In another investigation, 90% of the preterm and 75% of term neonates experienced hypocalcaemia after phototherapy.[8] Hypocalcaemia can cause serious manifestations like convulsions, apnea, laryngospasm, irritability, and jitteriness.[9] Hence, phototherapy-induced hypocalcaemia can be a significant problem. This study was undertaken to determine hypocalcaemia, in neonates receiving phototherapy, by measuring serum calcium levels.

METHODS

The cross sectional study was carried out in the Neonatal Intensive Care Unit (NICU) of the Department of Pediatrics,

Nepalgunj Medical College, Kohalpur from February 2020 to August 2020. Ethical clearance was obtained from the institutional Review Committee, Nepalgunj Medical College and Teaching Hospital. Study included 50 neonates who were admitted for phototherapy. Selection of cases was done by convenient sampling method. Neonates were divided in two groups- preterm and term. Informed consent was taken from their parents/guardians. Complete history and thorough physical examination was carried out in all the cases. Serum calcium was measured at initiation of phototherapy and 24 hours after completion of phototherapy. Neonates with jaundice requiring exchange transfusion, birth asphyxia, sepsis, and conjugated hyperbilirubinemia, infants of diabetic mother and with congenital anomalies were excluded from the study.

Requirement of phototherapy was decided based on American Academy of Pediatrics (AAP) Guidelines and according to birth weight in preterm neonates.[10] The neonates were clinically assessed for features of hypocalcaemia i.e. jitteriness, irritability/excitability and convulsions, as well as other complications like rashes, loose stool, fever and dehydration. Hypocalcaemia in the neonates was managed with intravenous calcium supplementation.

Data were analyzed using statistical software SPSS 25. The results were calculated as mean ± standard deviation and compared based on the paired t-test. P <0.05 was considered statistically significant.

RESULTS

In the study, 50 neonates admitted in NICU for phototherapy were evaluated for hypocalcaemia. Among them 25(50%) were preterms and terms were 25(50%). Male newborns were 28(56%) and 22(44%) were females. Most of the neonates were exclusively breastfed 23(46%), 11(22%) of them were under lactogen feeding because of inadequate milk let down in mothers, and rest 16(32%) were under mixed feeding (mother's milk and lactogen).

	Preterm (Mean±SD) (n=25)	Term (Mean±SD) (n=25)	p-value
Serum calcium before phototherapy (mg/dl)	8.42±0.9	9.90±3.1	<0.01
Serum calcium after phototherapy (mg/dl)	8.12±3.4	8.73±4.2	<0.01

Table I: Comparison of serum calcium level before and after phototherapy.

Frequency of hypocalcaemia after phototherapy was 20% and 32% in preterms and terms respectively. Mean serum calcium level before and after phototherapy was 8.42±0.9 mg/dl and 8.12±3.4 mg/dl in preterms, whereas it was 9.90±3.1 mg/dl and 8.73±4.2 mg/dl in term neonates. Statistical analysis showed hypocalcaemia was significant in both the groups, preterms and terms (p<0.01). (Table I).

Total serum calcium level (mg/dl)	Before Phototherapy (n=50)		After Phototherapy (n=50)		p- value
	Mean	SD	Mean	SD	<0.01
	9.1	2.3	8.9	3.8	

Table II: Change in serum calcium level with phototherapy.

In the present study, there was a significant decrease in serum calcium levels after phototherapy (p<0.01). The mean values of serum calcium before and after phototherapy were 9.1±2.3 mg/dl and 8.9±3.8 mg/dl respectively (Table II). Of the 50 neonates in the study, 13(26%) showed hypocalcaemia after phototherapy; among those 13 neonates, 56% developed hypocalcaemia symptoms; 18% developed irritability/ excitability, 38% developed jitteriness and none of them developed convulsions.

DISCUSSION

Neonatal jaundice is a frequent cause of morbidity in newborns worldwide and significant cause of hospitalization, mainly in the first week.[1] Efficacy of phototherapy in treatment of hyperbilirubinemia in newborns has been well established. The efforts made around the globe recognize it as a potential complication with variable results, some showing severe hypocalcemia.[7] Romagnoli et al. was the first to suggest the association of hypocalcaemia in a newborn following phototherapy.[11] Abrams SA hypothesized that phototherapy inhibits pineal secretion of melatonin which blocks the effect of cortisol on bone calcium. Cortisol unchecked exerts a direct hypocalcaemia effect and increases bone uptake of calcium as well.[12] In a study by Khan et al. there were 62.6% males and 37.4% females.[1] Also in a study by Alizadeh TP there were 49% female neonates and 51% were males.[13] Observation in our study is similar to the above studies where number of male neonates is higher than that of females. Yadav et al observed that 66% of term and 80% of preterms developed hypocalcaemia after phototherapy.[7] Sethi et al. reported that 90% of preterm neonates and 75% of full-term neonates developed hypocalcaemia after being subjected to phototherapy.[8] This is in contrast to the present study where terms were 50% and preterms were also 50%. The selection method being convenient sampling method is attributed for this contrast. In the present study, mean serum calcium level before and after phototherapy was 8.42±0.9mg/dl and 8.12±3.4mg/dl respectively in preterms, whereas it was 9.90±3.1mg/dl and 8.73±4.2mg/dl respectively in term neonates. Statistical analysis showed hypocalcaemia was significant in both the groups, preterms and terms (p<0.01). Similar to the study by Shrivastava J *et al.* where the serum calcium level before and after phototherapy in preterm babies was 8.82 ±0.59 mg/dl and 6.64 ± 1.03 mg/dl respectively, whereas in term neonates it was 9.32 ± 0.99 mg/dl and 7.58 ± 0.83mg/dl respectively. Hypocalcaemia after phototherapy was statistically significant (p<0.001).[14] Also in a study by

Singh PK et al. the mean serum calcium level in the preterm neonates before and after phototherapy was 8.41 mg/dl ± 0.466 and 7.1 mg/dl ± 0.793 respectively. In term neonates the mean serum calcium level was 9.52mg/dl ± 0.53 and 8.42mg/dl ± 1.1 respectively. Change in calcium level was statistically significant ($p<0.05$).[15]

In a study by Goyal S et al. mean serum calcium levels before phototherapy was 9.14±0.78mg/dl and it reduced to 8.53±0.77mg/dl after phototherapy. The reduction was statistically significant ($p<0.001$).[16]Alizadeh TP et al. in their study found the mean serum calcium levels before and after phototherapy were 9.8±0.8 mg/dl and 9.5±0.9 mg/dl respectively. The difference in serum calcium level before and after phototherapy was statistically significant ($p=0.03$).[13]Similar to the present study where mean values of serum calcium before and after phototherapy were 9.1±2.3 mg/dl and 8.9±3.8 mg/dl respectively. Also there was a significant decrease in serum calcium levels after phototherapy ($p<0.01$). In the present study, 13 out of 50 neonates showed hypocalcaemia after phototherapy. Among them 56% were symptomatic; 38% developed jitteriness, 18% developed irritability/excitability, and none of them developed convulsions. Similar to the study by Yadav RK et al. where 30% of hypocalcaemia neonates developed jitteriness, 20% developed irritability/excitability, 30% developed letharginess and none of the neonate developed convulsions.[7]In a study done by Jain BK et al. 63.6% of hypocalcaemia preterm newborns had jitteriness and 27.3% had irritability whereas 50% of hypocalcaemia term neonates had jitteriness and 16.7% were irritable.[17]

LIMITATIONS

Duration of phototherapy is not constant for all the neonates which might have affected the results. In the same manner, age at initiation of phototherapy is also not same in all cases, there might be exaggeration of physiological hypocalcaemia in some neonates. Also the number of cases taken in the current study is small, larger case number would have given more precise and more reliable results.

CONCLUSION

Phototherapy induced hypocalcaemia is a significant finding in neonates with jaundice. Therefore, estimation of calcium levels before and after phototherapy and close monitoring of neonates for signs of hypocalcaemia should be done as well as treated accordingly. A universal recommendation of calcium supplementation in neonates undergoing phototherapy is yet to be established but seems reasonable taking into account the evidence in various studies.

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ORIGINAL ARTICLE

Kirschner's Wires Fixation of Unstable Distal Radius Fractures in Children with the Kapandji Technique

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ABSTRACT

Introduction: Unstable distal radius fractures in children have more tendencies to get displaced with conservative management resulting into deformity. This Kapandji technique of K-wire fixation is on rise to reduce and maintain these fractures in recent days. **Aims:** The aim of this study was to evaluate the effectiveness of the K-wires fixation in unstable distal radius fracture with Kapandji techniques. **Methods:** A cross-sectional observational study was conducted in Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke in unstable distal radius fracture in children with K-wires fixation using Kapandji method. **Results:** Twenty eight unstable distal radius fractures in children between 6 to 14 years of age were treated with one intrafocal K-wire and one or two extra focal K-wires to augment fixation. Immobilization of forearm with above elbow slab/cast for four to six weeks was enforced. K-wires were removed between four to six weeks of operation depending upon the union and followed prospectively for four months. The mean age of patients presented was 8.57± 1.79 years. This technique brought near anatomical reduction in all fractures. There was no reduction loss or remanipulation in any case. All fractures achieved union and functional outcome was excellent in 24 cases based on Modified Mayo Wrist Score. There was fewer complications like pin tract infection. **Conclusion:** This Kapandji technique of K-wire fixation, leverage reduction method, being an additional tool helps to achieve near anatomical alignment, and maintain reduction throughout the duration of healing. So it is an advantageous technique.

Keywords: Kapandji technique, Leverage technique, Unstable distal radius fracture

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INTRODUCTION

Fractures in children (9%), being common health problem that present in emergency each year, has a significant burden to health care system.[1, 2] Among them wrist fracture is the commonest fracture and distal radius fracture accounts for around 35% of them, resulting from fall on an outstretched hand or direct blow to arm.[3, 4] Displaced distal radius fracture is often subjected to close reduction and cast immobilization but the risk of redisplacement is there (21 to 39 %).[5-7] So, operative treatment with closed reduction under fluoroscopy and percuataneous K-wire fixation has evolved.[8] Recommendation for operative treatment varies e.g. unreduced distal radius fracture, completely displaced fracture.[9-11] However, there are risks of pin tract infection, neuropraxia and premature closure of physis. The aim of this cross-sectional observational study was to evaluate the outcome of unstable distal radius fracture in children treated with Kapandji technique in the tertiary care center, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke, in the western part of Nepal.

METHODS

This study is a cross-sectional observational study done in 28 children between 6 to 14 years of age, who were admitted in Nepalgunj Medical Teaching Hospital, Kohalpur, Banke from August 2018 to October 2019 who had unstable distal radius fractures. Unstable distal radius fracture includes; translation of more than half the diameter of bone, with or without ulna fracture at the same level, bayoneting and volar angulations.[12-14] All of them underwent closed reduction with Kapandji technique and fixed with K-wires. Informed written consent was taken from the parents/guardians and those who

meet the inclusion criteria and willing to take part in this study were included.

Inclusion criteria:

1. Age between 6 to 14 years.
2. Translation of distal radius more than half the diameter of bone with or without ulna fracture.
3. Bayoneting and Volar angulation.
4. Open fractures.

Exclusion criteria:

1. Age less than 6 years and more than 14 years.
2. Translation less than half diameter of bone.
3. Pathological fractures.

Surgical techniques

Under general anesthesia or brachial block, the forearm was positioned on the radiolucent table. Aseptic technique was followed and traction was applied to maintain the radial length. In a lateral position of the forearm and under fluoroscopy intra-focal K-wire, of 1.5 to 2.5mm diameter depending upon the bone diameter, was inserted dorsally at the fracture site and it was guided towards the proximal fragment. The posterior cortex of the proximal fragment was levered out posteriorly.[15] After the posterior cortex was aligned, the K-wire was passed into the proximal fragment which reduced the fracture and it was confirmed with fluoroscopy. Depending upon the stability one or two extrafocal K-wires were passed from the lateral side into the proximal medial direction, from the radial styloid, or proximal to the physeal line. K-wires were left outside with sterile dressing. The associated ulna fractures were treated with percutaneous or intramedullary K-wires. Above elbow slab/cast was applied in pronation and ulnar deviation.

Postoperative X-ray was observed and patients with closed fracture were discharged on next day. Those with associated ulna fracture treated with K-wires, they were kept for three days to give intravenous antibiotics (cefuroxime) and alternate dressing and they were discharged on the third post-operative day in oral antibiotics (cefuroxime) for seven days more. Those with open fracture, they had iv antibiotics for five days and they were changed into oral and discharged on seventh day. Patients were reviewed after seven days for pin tract infection at the site of entry of K wires, discharge and displacement with radiograph. Slab/cast and K-wires were removed after the X ray showed the features of union, usually after 28 days. Otherwise, K- wires were continued for two weeks more in cast. Patients were encouraged to mobilize the wrist after removal of slab/cast and K-wires and followed for four months period. Wrist function was accessed at 12 to 16 weeks of treatment, on the basis of "Modified Mayo Wrist Score" which analyze these parameters; pain, mobility, strength of grip and level of satisfaction.

Statistical analysis:

SPSS version 25 was used to perform statistical analysis and p value<0.05 was considered statistically significant. Chi square test was used to analyze functional outcome. Mean and standard deviation were calculated for all measured and calculated values.

RESULTS

Twenty-eight patients completed the follow-up. The mean age of children was 8.57± 1.79years (range, 6 to 14 years) with male predominance of 17 (60.7 %) as shown on table I.

		Sex		Total
		Female	Male	
Age in years	6- <10	8	13	21
	≥10-14	3	4	7
Total		**11**	**17**	**28**

Table I: Age and sex distribution.

Fall on out stretch hand was the common mechanism of injury, 20 (71.4%). It took approximately 22.5±5.01 minutes (range 15 to 30 minutes) to do the procedure. All distal radius fractures were reduced with intrafocal K-wire and additional one or two extrafocal K-wires were used to stabilize fractures in 23(82.1%) and 5(17.9%) children respectively. Eighteen (64.2%) patients had associated ulna fractures shown on table II. K-wire was placed from proximal end of ulna in 8 cases and from distal end in four cases. Two (7%) out of 12 cases who underwent ulna fixation, had open fracture at ulna; among two open fractures one had associated supracondylar fracture. One with associated supracondylar fracture of humerus was treated with open reduction through the posterior approach and fixed with K wires after distal radius and ulna were fixed. Above elbow slab was applied in 10 cases with radius fracture only and above elbow cast was applied in 18 cases associated with ulna fracture and window were made at the site of pin and wound on first post-operative day for dressing.

		Closed fractures	Open fractures	Total
Radius only fracture		10	0	10
Associated ulna fracture	Undisplaced and not fixed with K-wires	6	0	6
	Displaced and fixed with K-wires	10	2	12
	Total	**26**	**2**	**28**

Table II: Distribution of type of fracture and associated ulna fracture.

In all cases, Kapandji technique brought anatomical or near anatomical reduction and no open reduction was performed in any case. Immediate postoperative X-rays did not show residual angulations and/or translation. In 10 cases, those with radius fracture only, slabs were continued for four weeks and those associated with ulna fracture (18 cases) above elbow

cast was continued for three weeks in 16 cases then converted into below elbow cast was continued for two weeks more. Those with associated open fracture it was continued for four weeks and converted to below elbow cast continued for two weeks more. K-wires and slabs were removed in four weeks in ten patients, in 16 cases it was removed in five weeks and in two patients with distal radius and open ulna fracture, K-wires were removed at six weeks. The duration of treatment was uneventful. Twenty patients had full range of motion on two weeks after removal of K-wires. Six patients had it after three weeks of removal who had associated ulna fracture and one had it after four weeks who had associated open fracture at ulna, after removal of K-wires.

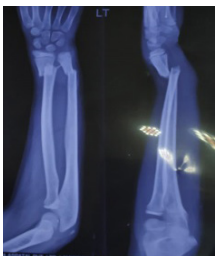

Figure 1: Before surgery, distal radius and ulna fracture

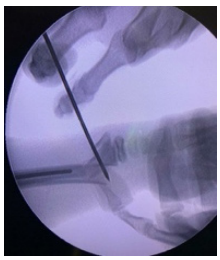

Figure 2: Kapandji technique of fracture reduction

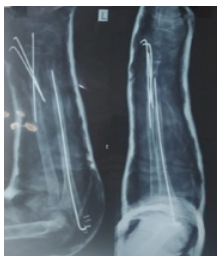

Figure 3: X-ray on first post-operative day

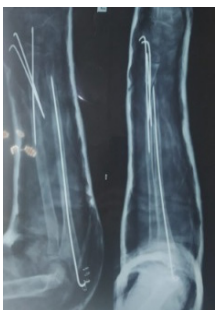

Figure 4: X-ray on one week follow up

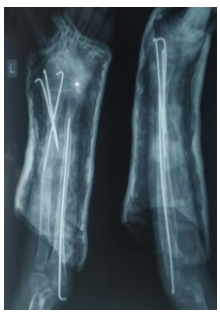

Figure 5:X- ray on five weeks follow up

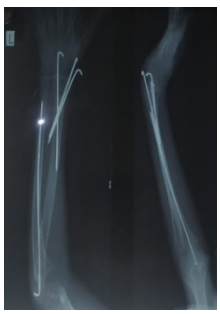

Figure 6:X-ray just before removal of K-wires

Figure 1: Sequential radiograph of distal radius fracture associated with ulna fracture.

Average follow up was 4.2 months (four to six months). One patient with open fracture had discharge from ulnar side at fracture which was serous type and it subsided after three days of operation. It was managed by alternate day dressing and antibiotics. Two patients, who skipped two weeks follow-up, came on third week, had pin tract infection, which resolved after a week with alternate day dressing and antibiotics. One patient had restricted range of motion for six weeks.

On final follow-up the functional outcome was excellent in 24 (85.7%) cases, good in three (10.7%) cases and optimal in one (3.6%) case as shown in table III and IV. The associated open fracture of ulna had optimal outcome, p = <0.01.

Fractures	Functional outcome			Total
	Excellent	Good	Optimal	
Radius fracture only	10	0	0	10
Associated ulna fracture treated conservatively	6	0	0	6
Associated ulna fracture treated with K-wires	8	3	1	12
Total	**10**	**3**	**1**	**28**

Table III: Functional outcome on the basis of types of fracture and method of treatment.

Ulna fracture		Functional outcome			Total
		Excellent	Good	Optimal	
Closed	not fixed	6	0	0	6
	fixed	8	2	0	10
Open		0	1	1	2
Total		**14**	**3**	**1**	**18**

Table IV: Functional outcome on the basis of associated open and closed ulna fracture.

DISCUSSION

Closed reduction and casting has been the standard method of treatment in distal radius fracture but due to irreducibility and redisplacement, closed reduction and K-wire fixation has been evolving. Sengab et al[8] in meta-analysis reported that unstable distal radius fractures and those with the risk factors have higher incidence of redisplacement after reduction.So, primary K-wire fixation is better than conservative treatment. McLauchlan et al[16], in a prospective randomized controlled trial, suggested percutaneous K wire fixation for displaced distal radius fracture is a reliable method to maintain alignment and prevent redisplacement which lessens resurgery compared to closed reduction and casting. Sometimes, reduction of fracture is difficult so, the Kapandji technique is in rise for those fractures rather than the open reduction as this method of treatment has lesser complications compared to it. As Parikh et al[17] in retrospective case control study, described this technique as a added reduction tool where close manipulation fails. This technique helped to reduce the fracture in this study too. Strohm et al[18] in a prospective randomized trial of 100 distal radius fracture treated by K-wire in adults concluded Kapandji method of treatment has a better outcome than those of conventional two extrafocal k wire fixation that was introduced through the radial styloid, Willenegger techniques. Choi et al[19] in conventional K-wire treatment of unstable distal radius fracture in children in 157 cases, eight percent of cases landed into open reduction and 6.4% cases lost the reduction. In current study none of the cases need the open reduction. There was no loss of reduction after stabilization with two to three K wires. Generally, radiographs are taken at seven to 10 days interval for first three weeks to assess early unacceptable redisplacement or fracture reduction.[14, 16] In our

study 12 patients had three radiographs taken, 14 patients had four radiographs taken and two had five radiographs taken before removal of pin because they were followed for two weeks more and it was done before removal of pin to ensure the adequate union. It is comparable to the study done by Satish et al.[15] McLauchlan et al[16] and Ozcan et al [20] observed lesser radiograph in patients with K-wire fixation but this study had longer follow ups, up to 12 weeks depending upon age of patient and the outcome of the fracture for the study purpose. Parents were satisfied with appearance of wrist at first visit of K-wires removal. Most of the patient regained full range of motion and follow ups were discontinued. This Kapandji technique is an example of first class lever, surgeon reduced the fracture with adequate effort and it was smooth.[15]

Complications associated with Kapandji technique are less compared to conventional K-wire fixation like open reduction of fracture, loss of reduction and pin tract infection. In this study one patient had infection of wound, which subsided after three days of intravenous antibiotics and alternate day dressing. Two patients had pin tract infection as they skipped the follow up on the first two weeks.

The functional outcome was comparable with the study done by Kamiloski et al. [21] At final follow up in this study, patients did not complain of pain except two cases, 26 patients were satisfied but two patients were moderately satisfied as per modified Mayo wrist score. Among two patients one had associated open fracture at ulna and supracondylar fracture, and another had communited fracture of radius. Twenty-seven patients had normal range of motion compared to the normal limb but one had 80% of range of motion who had prolonged immobilization. Grip strength was comparable with normal hand in all cases. On the basis of Mayo Wrist Score 85.7 % (24) had excellent result.

Though it is accepted that the malunited distal radius fracture remodel with better cosmetic and functional outcome in children, parents or guardians are worried about the it, so they prefer to do operative treatment in this study. Union and joint stiffness are not major problems as compared to malunion. To avoid malunion, regaining range of motion as soon as possible and decreasing duration of treatment and follow-up, this Kapandji technique provides the better option regarding that. This decreases the cost and stress in the caregivers.[15] Thus, the Kapandji technique is better method of fixation with unstable distal radius fracture in children.

LIMITATION

Small sample, non-randomized control trails and short duration of follow ups are the limitations.

CONCLUSION

Kapandji technique of K-wire fixation is better, easier and advantageous method of treatment of unstable distal radius fracture in children as it is easier leverage technique which can be done without difficulty and it decreases the risk of redisplacement, and duration of follow up.

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Patterns and Severity of Alcohol Consumption in Patients with Alcoholic Liver Disease: A Cross-Sectional Study

Niroula N

ABSTRACT

Introduction: Alcohol is a known cause of liver cirrhosis, with its incidence increasing in relation to the total amount and duration of intake. Excessive consumption of alcohol remains the main cause of alcohol-related liver disease and associated complications and deaths. **Aims:** To delineate the drinking patterns and severity of alcohol consumption in alcoholic liver disease patients. **Methods:** A descriptive cross sectional study was conducted among 95 patients of both sexes with the diagnosis of alcoholic liver disease (ALD), who were admitted in Medicine ward at Nepalgunj Medical College, Nepalgunj. The diagnosis of ALD was confirmed by the criteria of the ICD-10-CM. The severity of alcohol drinking screened and categorized as "low-risk drinkers," "hazardous drinkers," and "harmful drinkers" were based on the AUDIT score. **Results:** Among a total of 95 ALD patients, the mean age was 45.10 ±7.60 years, the mean duration of alcohol use was 22.6 ±7.65 years and the average amount of alcohol consumed in grams/day was 240 ± 35. Majority of the patients consumed locally brewed alcohol, Raksi 46.3% followed by Jaad 22.1% and Others 11.6%. Very few patients consumed commercially available Spirits 6.3% or Beer 13.7%. Majority of patients were found to be drinking regular with intermittent bingeing pattern 61%, outside meal times 69.5% and hazardous drinking 53.7%. **Conclusion:** Overall our analyses indicated a precise picture of drinking patterns in ALD patients that are profoundly influenced on several cofactors like alcohol type, duration of exposure, drinking patterns, cultural habits, availability of homemade beverages and individual susceptibility. We recommend screening for alcohol abuse in all adult patients presenting to the hospital as early detection of ALD can decrease its both morbidity and mortality.

***Keywords*:** Alcoholic liver disease, Alcohol use disorder, Alcohol consumption, Hazardous drinking, Home brewed alcohol

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INTRODUCTION

Alcohol use disorder account for a significant cause of preventable disease worldwide, with resultant alcoholic liver disease causing significant liver-related morbidity and mortality among adults with prolonged alcohol abuse.[1, 2] Approximately 1 in 12 adults have alcohol use disorder defined as consumption of >3 drinks per day in males and >2 drinks per day in females, or binge drinking >5 drinks in males and >4 drinks in females, consumed over 2 h period.[3]

The three most widely recognized forms of ALD are alcoholic fatty liver (steatosis), acute alcoholic hepatitis, and alcoholic cirrhosis. Steatosis will develop in 90%-95%, [4] 10%–35% develop alcoholic hepatitis, and approximately 10% will develop alcoholic cirrhosis.[5] South Asian race and female sex are more prone to develop liver disease with lesser alcohol consumption.[6] A prospective Italian study showed the risk threshold for developing ALD is 30g ethanol/day and this risk increases with increasing daily intake.[7] ALD is increased in those who drink without accompanying food and also in those who drink multiple different alcoholic beverages.[7] Subjects who consumed more than 120 g/day had the highest risk of cirrhosis, with a prevalence of 13.5%.[7] Women had greater susceptibility to ALD at any given level of intake.[8,9]

Drinking problems occur over a broad continuum, ranging from heavy or hazardous drinking to harmful drinking. Prevalence estimates range from 4% to 29% for hazardous drinking and from less than 1% to 10% for harmful drinking. [10] While it is the ethanol in spirits that is primarily responsible for liver damage, other aliphatic alcohols have even more pronounced hepatotoxic effects.[11, 12]

METHODS

A cross-sectional study was conducted to evaluate the patterns of alcohol consumption and severity of drinking behavior of patients with alcoholic liver disease, who were admitted in

Medicine ward at Nepalgunj Medical College, Nepalgunj, Banke, Nepal, from August 2019 to August 2020 following all appropriate institutional ethics committee clearances. For inclusion, patients admitted in medicine ward with the established diagnosis of alcoholic liver disease by the criteria of the ICD-10-CM[13] entered into the study. The patients were excluded from the study, if they showed hepatic encephalopathy, were inebriated at the time of the interview, or had any other condition that prohibited them to properly answer the questionnaire. The amount of alcohol consumed per day was calculated in grams (one unit equals 10ml or 8g of pure alcohol) and the concentration of locally brewed alcohol was taken as raksi, 25%; chhang, 12%; Jaad, 5.2%; and tongba, 5.5% obtained from the previous study done in the laboratory of the Hôpitaux Universitaires de Genève (Geneva University Hospitals, Geneva, Switzerland).[11] In our study, the health risk of drinking alcohol was graded using AUDIT[12] as low risk drinkers defined as those having AUDIT score of <8, while hazardous drinkers were defined as those with AUDIT score between 8 and 15. However, those with AUDIT score of ≥16 were classified as harmful drinkers. Developed by the World Health Organization (WHO), AUDIT incorporates questions about the quantity and frequency of alcohol use in adults to identify persons whose alcohol consumption has become hazardous or harmful. The sample size was calculated by using the formula 4pq/d2 (where; p=prevalence, 38.5%[14]; q= 100-p, 95%; d= margin of error, 10%). The sample size according to this formula was 95. A self-designed semi structured questionnaire was used to obtain the socio-demographic characteristics of the study population. Information about drinking pattern, frequencies, and other factors were also collected from a reliable informant as persons with alcohol dependence may underestimate their alcohol consumption, which is inherent in studies of this population. Data were analyzed using SPSS version16 and descriptive analysis was performed.

RESULTS

A total of 95 patients were analyzed, of which 72 (76%) were male and 23 (24%) were females. The mean age of ALD patients was 45.10 ±7.60 years, mean age of first drink was 20.4 years and that of alcohol abuse/dependence was 27.07 years. The mean duration of alcohol use was 22.6 ±7.65 years. The amount of alcohol consumed in grams/day was 240 ± 35. (Table-I). Majority of the patients consumed homemade, locally brewed alcohol, like Raksi 46.3% followed by Jaad 22.1%. and Others (Aila/Chhang/Tungba) 11.6%. Very few patients consumed commercially available spirits (whiskey, vodka, gin) 6.3% or beer 13.7% as presented in Table-I. Majority of patients were found to be drinking with regular with intermittent bingeing pattern 61% and outside meal times 69.5%. The severity of alcohol drinking was screened using AUDIT scale as summarized in Table-I, which shows that the most prevalent pattern was hazardous drinking 53.7%.

		n=95
Variables	**Category**	**Mean ± SD/ n (%)**
Age	Mean age of ALD patients (years)	45.10 ±7.60
	Mean age at first alcohol use (years)	20.4±3.6
	Mean age at alcohol abuse or dependence (years)	27.07±3.14
Sex	Male	72 (76)
	Female	23 (24)
Duration of drinking	Mean duration of alcohol intake (years)	22.6±7.65
Amount of drinking	Amount of alcohol consumed (g/day)	240**±35**
Frequency of drinking	Regular	26 (27.4)
	Regular with intermittent bingeing	58 (61.0)
	Bingeing	11 (11.6)
Relation to meals	With meals	29 (30.5)
	Outside meal times	66 (69.5)
Types of alcohol	Raksi	44 (46.3)
	Jaad	21 (22.1)
	Beer	13 (13.7)
	Spirit (whiskey, rum,vodka, gin)	06 (6.3)
	Other (Aila/Chhang/Tungba)	11 (11.6)
Severity of Alcohol Use (AUDIT)	0-7 (Low risk drinking)	11 (11.5)
	8-15 (Hazardous drinking)	51 (53.7)
	≥16 (Harmful drinking)	33 (34.8)

Table I: Alcohol consumption characteristics of the study participants.

DISCUSSION

The demographic variables of our study revealed that the prevalence of ALD was higher in men 76% than in women 24%, which is consistent with previous studies.[15, 16]The male predominance over female is most probably due to high incidence of ethanol intake among men compared to women. In the case of alcohol, social stigma may also lead to delay in seeking health care in females and it is possible that this could specifically have led to underreporting of ALD in women.

The mean age of first drink was 20.4±3.6 years and that of alcohol abuse/dependence was 27.07 ±3.14 years in our study. In a study by Johnson *et al*.[17], the mean age of first drink

was 21.39 ± 5.34 years, and the mean age of alcohol abuse/ dependence was 27.8 ± 5.7 years which is similar to our study. The mean duration of drinking in ALD patients in our study was 22.6 ±7.65 years. Narawane *et al*[18]and Kamper-Jorgensen *et al*.[19] found that drinking for more than 14 and 20 years, respectively, was significantly more common in ALD. The average amount of alcohol consumed was 240 grams or 30 units in our study. This is similar to a study conducted by Becker et al in which ALD is associated with higher alcohol intake 345 g of alcohol consumption per day.[8]Around 400 g of alcohol per day was associated with death due to liver cirrhosis related to alcohol. However, the relationship between alcohol and liver injury depends on several cofactors like alcohol type, duration of exposure, drinking patterns, and individual susceptibility. Specifically, patients with moderate alcohol drinking may still be predisposed to ALD, if they have other metabolic risk factors.[19] Majority of patients were found to have a regular with intermittent bingeing pattern 61% and drinking outside meal times 69.5% in the present study. Food has an attenuating effect on alcohol.[20] It was observed in a study by Bellentani *et al* that persons who drink without accompanying food and also who drink multiple different alcoholic beverages have a higher risk of ALD.[7]Their progression also depends on the pattern of alcohol intake–drinking alcohol at mealtimes results in a lower risk of liver disease than consumption at other times; intermittent drinking is more sparing for the liver than a continuous supply of alcohol.[21] Health risk of drinking alcohol graded using AUDIT scale in our study showed that the most prevalent pattern in ALD patients was "hazardous drinking" 53.7% followed by "harmful drinking" 34.8%, which was consistent with the studies of Hilton *et al*, where the hazardous drinking and harmful drinking pattern was more associated with the development of ALD.[22]

In our study, we found that most of the patients developing ALD showed increase in the consumption of locally-made alcoholic beverages like Raksi 46.3% followed by Jaad 22.1%. An increase in the risk for the development of ALD with increasing alcohol consumption was seen in patients consuming 240 grams or ≥ 30 units per day in our study. In Nepal, locally brewed alcohol is available at much cheaper rates and it is also more widely available whereas wine is consumed very rarely, mainly because it is expensive by local standards.[11]There are conflicting data regarding the type of alcohol consumed and the risk for developing liver disease. In a study performed in India, ALD occurred more commonly with the consumption of illicit liquor, despite its lower alcohol content.[18]In yet another study, researchers found that when the alcohol intake is high, the risk for developing alcoholic cirrhosis is equal, irrespective of the type of alcoholic beverage.[23]Free radical formation after alcohol intake and a reduced level of antioxidants has been implicated in the pathogenesis of alcohol-induced liver disease.[24,25] Locally brewed alcoholic beverages frequently contain aliphatic alcohols as by products, and the amount of these contaminants in spirits varies considerably depending on the raw materials and production methods used.[26]We do not know the cause of toxicity of locally brewed alcohol, like Raksi. The toxicity of raksi may be related to the manufacturing process, the fermentation process, and the additives used. It may also be possible that raksi drinkers are more exposed to other known cofactors for liver disease than other beverages drinkers, which were not recorded in this study.

LIMITATIONS

The study only included hospitalized patients and does not reflect distribution of alcohol-related diseases in the population. In the case of alcohol, social stigma may also lead to delay in seeking health care. It is possible that this could specifically have led to underreporting of ALD in women. This knowledge is imperative to plan and develop specific alcohol prevention programs.

CONCLUSION

The findings of this study provide a precise picture of drinking patterns in ALD patients that are profoundly influenced by several cofactors like alcohol type, duration of exposure, drinking patterns, cultural habits, availability of homemade beverages and individual susceptibility. In addition, the increased risk of ALD in rakshi consumers indicates the possibility of specific toxicity for some homemade alcoholic beverages. Thus, it is imperative to devise new strategies to raise public awareness about the harmful effects of alcohol, screen alcohol drinking, and conduct brief intervention sessions in the outpatient department. Thus, a test such as the AUDIT providing data on the drinking pattern should be used for screening for alcoholism, as laboratory parameters do not help in distinguishing frequent heavy drinkers It would also be helpful to set up abstinence clinics or organizations, with intent to convince patients with liver disease to stay away from alcohol consumption.

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Maternal and Perinatal Outcome in Anemic Pregnancies

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ABSTRACT

Introduction: Anemia in pregnancy is a public health problem of developing countries and has a significant impact on the health of mother and fetus. It is one of the leading cause responsible for maternal and perinatal morbidity and mortality. **Aims:** To find out the severity of anemia in pregnancy and its maternal and perinatal outcome. **Methods**: A prospective randomized case control study undertaken in the Department of Obstetrics and Gynecology, Nepalgunj Medical College, Kolhapur from September 2019 to August 2020. Total of 200 study subjects were enrolled, cases and control were 100 each, with cut off for anemia as 11gm/dl. **Results**: Out of 100 cases of anemia, 58 were mildly anemic (Hemoglobin: 10-10.9), 23 moderately (7-10) and 21 severely anemic (<7gm/dl). Anemic cases were found to have higher incidence of preterm birth (8%), postpartum hemorrhage (5%), and maternal morbidity (19%) than in non-anemic controls. Adverse fetal outcome in the form of preterm birth (8%), Intrauterine Growth Restriction (14%), Still birth (3%), Early neonatal death (4%), Low birth weight babies (22%), neonatal morbidity (17.5%) was more in anemic group than non-anemic controls. **Conclusion**: Anemia in pregnancy has adverse effects on the mother and fetus. It is important to diagnose and treat anemia in pregnancy to ensure optimal health of mother and newborn.

***Keywords**:* Anemia, Adverse Outcome, LBW (Low birth weight), PPH (Postpartum hemorrhage)

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INTRODUCTION

Anemia in pregnancy is a public health problem of developing countries and is associated with adverse outcomes in pregnancy.[1] It is a condition in which the number of red blood cells of the body is insufficient to meet physiological needs. According to WHO, for pregnant women, anemia is defined as blood hemoglobin level <11 g/dL, and further categorized as mild (10.0–10.9 g/dL), moderate (7.0–9.9 g/dL), and severe anemia (<7.0 g/dL).[2] Iron deficiency is thought to be the most common cause of anemia worldwide. About 20% of perinatal mortality and 10% of maternal mortality in developing countries is attributed to iron deficiency.[3] Maternal anemia is associated with maternal and child morbidity and mortality such, as increased risk of miscarriage, stillbirth, prematurity, and low birth weight of the baby.[4]

Evidence shows the requirement of iron increases significantly during second and especially during third trimester of pregnancy.[5] During such conditions, dietary iron intake in the majority of population of the developing countries is not sufficient.[6] This could be due to the low consumption of limited animal source food, green leafy vegetables and fruits in their daily life[7], and high utilization of iron for oxygen supply to both mother and fetus.[8]

The menace of anemia is still very rampant all over the country even today in spite of improvements in diagnosis and therapy.

This fact gains mammoth importance, therefore, this study aims to determine maternal and perinatal outcomes in anemic mothers.

METHODS

A, prospective, randomized, case control study was undertaken in the Department of Obstetrics and Gynecology, NGMC, Kohalpur from September 2019 to August 2020 to find out the severity of anemia and maternal and perinatal outcome .Ethical clearance was taken from the institutional review committee, NGMC and written informed consent was taken from each patient.

All women attending antenatal outpatient department or delivered in labor room, singleton pregnancy, in 3rd trimester with microcytic hypo chromic anemia and Hemoglobin (Hb%) < 10.9 gm/dl were included in the study whereas multiple pregnancies, gestational age < 28 weeks, in 1st and 2nd trimester with dimorphic or hemolytic anemias were excluded. There were a total of 200 study subjects. Patients were randomly divided into two groups with 100 patients as a case and another 100 as a control groups on the basis of lottery method. Hb% is taken as criteria for deciding anemia cases and also to classify the severity.

All study subjects were studied in full details in particular reference to age, literacy and socio economic status, detailed obstetric and menstrual history. Present pregnancy details regarding the number of antenatal visits, ill health, chronic infection or infestation any time during pregnancy were studied. Different mode of delivery, intrapartum and postpartum complications were studied. Detailed neonatal examination and neonatal complications are noted.

The investigations that were done in the cases were 1) Complete blood count 2) Blood grouping and Rh typing 3) Stool for ova and cysts in second trimester. 4) Urine RME 5) Obstetric scan 6) Peripheral Blood Smear. Only Hb% was done in the control group. All the study subjects were followed up till they were discharged from the hospital. Results are presented as number and percentage for corresponding each group. Chi-square test was used for the analysis of data between two groups. A p-value 0.05 or less than 0.05 was considered as statistical significance.

Formula used for analysis: Chi-square test

$x^2 = \sum (O-E)^2/E$

Data collected in structured proforma were entered in Microsoft Excel, compared by using chi-square test and statistical analysis was done with SPSS version 22.

RESULTS

The study subjects were divided into two groups.

- 100 cases of anemic.
- 100 cases of non-anemic controls.

Severity of Anemia	No. of cases	Percentage (%)
Mild	58	58
Moderate	23	23
Severe	19	19
Total	**100**	**100**

Table I: Distribution of cases according to the severity of anemia.

Among the 100 patients with anemia, 58% had mild, 23% had moderate and 19% had severe anemia (Table I).

Variables	Cases		Controls	
	N=100	%	N=100	%
Term labor	92	92	98	98
Preterm labor	8	8	2	2
Post term	0	0	0	0
Total	**100**	**100**	**100**	**100**
Mode of delivery	**Cases (N=100)**		**Controls (N=100)**	
Normal vaginal	63		84	
Instrumental delivery	10		8	
LSCS(Lower Segment Caesarean Section)	27		8	
Total	**100**		**100**	
p= 0.01				
Labor Complications	**Cases (N=100)**		**Controls (N=100)**	
	No. of cases	**%**	**No. of cases**	**%**
Retained placenta	1	1	0	0
PPH	5	5	1	1
CCF	0	0	0	0

* PPH: Postpartum hemorrhage, CCF: Congestive Cardiac Failure.

Table II: Outcome of delivered patients.

When two groups were compared, in terms of labor, mode of delivery and labor complications, the cases group had more preterm labor (8%), more underwent LSCS (27%) and had PPH (7%) as compared to controls groups (Table II).

Fetal Outcome	Cases (N=100)	Controls (N=100)	
Alive	97	100	
Stillbirth	3	0	
Total	**100**	**100**	
p=0.08			
Neonatal Complications	**Cases (N=100)**	**Controls (N=100)**	**P-value**
Preterm birth	8	2	0.05
IUGR	14	5	0.05
Still birth	3	0	0.08
ENND	4	0	0.06
Birth weight(kg)	**Cases (N=100)**		**Controls(N=100)**
<2.5kg	22		16
>2.5kg	78		84
Total	**100**		**100**
p= 0.28			
NICU admission	**Cases (N=97)**		**Controls(N=100)**
No	88		94
Yes	12		6
Total	**100**		**100**
p= 0.14			

*IUGR: Intrauterine Growth Restriction, ENND: Early Neonatal Death.

Table III: Adverse birth outcomes.

Adverse fetal outcomes in form of Stillbirth (3%), preterm birth (8%), IUGR (14%), LBW (22%) in cases than in control groups. NICU admission (12%) was also more among cases group (Table III).

Maternal morbidity	**Cases(N=100)**	**Controls (N=100)**
Failed lactation	4	0
Wound dehiscence	6	2
Febrile morbidity	5	0
Sub involution of uterus	1	0
Total	**19**	**2**
Neonatal morbidity	**Cases(N=97, live born cases)**	**Controls (N=100)**
RDS	3	1
Jaundice	2	2
Pulmonary hypoplasia	1	0
HMD	1	0
MAS	10	1
Birth asphyxia	0	2
Total	**17**	**6**
p = 0.05 (17.5% in anemic, 6% in control)		
Perinatal Mortality	**Cases(N= 100)**	**Controls (N= 100)**
Still birth	3	0
ENND	4	0
Total	**7**	**0**

*RDS: Respiratory Distress syndrome, HMS: Hyaline Membrane Diseases, MAS: Meconium Aspiration Syndrome.

Table IV: Maternal and Perinatal outcome.

When two groups were compared in terms of Maternal and Perinatal Outcome, the cases group had more maternal morbidity (19%), neonatal morbidity (17%) and perinatal mortality (7%) as compared to control group (Table IV).

DISCUSSION

Anemia is one of the major nutritional deficiency disorders affecting a large proportion of the population. The high prevalence of iron and other micronutrient deficiencies among women before and during pregnancy in developing countries is of concern and maternal anemia is a cause of considerable perinatal mortality and morbidity. It is an extremely common condition in pregnancy and postpartum world-wide, conferring a number of health risks to mother and child. Maternal signs and symptoms are usually non-specific, but can include: fatigue, pallor, dyspnea, palpitations and dizziness. There are numerous well-known maternal consequences of anemia including: maternal cardiovascular strain, reduced physical and mental performance, reduced peripartum blood reserves, increased risk for peripartum blood product transfusion, and increased risk for maternal mortality. This study assessed determinants of adverse birth outcome in anemic and nonanemic patients.

In developing countries, the cause of anemia during pregnancy is multifactorial and includes nutritional deficiencies of iron, folate, vitamin B_{12} and also parasitic diseases, such as malaria and intestinal parasitic infections. Our study showed, 58% were mildly anemic, 23% moderate and 19% were severely anemic which is comparable to the studies conducted by Thangaleela T and Vijayalakshmi P[9], Anita L et al[10], S parks et al.[11]

63% of anemic patients had normal vaginal delivery as compared to 84% of control group while 10% of anemic group and 8% of controls had instrumental delivery. 27% of anemic group as against only 8% of control group underwent LSCS. This is comparable to the study conducted by Awasthi A et al.[12] Anemic patients may not tolerate even the normal blood loss during delivery and leads to complications like PPH. The incidence of PPH in the present study was 5% where as it is 1% for the control group. Five of them had atonic PPH and were managed conservatively; similar results were found in S parks et al[11], Awasthi A et al.[12] There is a high incidence of adverse fetal outcome in the form of preterm birth (8%), Low birth weight babies (22%), Birth asphyxia (7%), IUGR (14%), stillbirths (3%), early neonatal death (4%) in anemic group compared to controls. The causes of early deaths in both groups were preterm birth and respiratory distress in the present study. Similar findings were reported by S parks et al[11], Awasthi A et al[12] and Hellen et al.[13]

The increased maternal and neonatal morbidity in cases in the present study is comparable to that done by Awasthi A et al.[12, 4] The maternal morbidity in the form of failed lactation (4%), wound dehiscence (6%), febrile morbidity (5%), sub involution of uterus (1%) in cases group. The neonatal morbidity in the anemic group was 17.5% vs. 6% in the control group. Preterm birth contributed much too neonatal morbidity requiring NICU admissions.

LIMITATION

This study only looked in the immediate outcome; further study is needed to assess the long term outcome.Confounding factors possibility is there in the outcome of fetus.

CONCLUSION

Antenatal care, as per WHO guideline is the basic requirement for prevention, early detection and treatment of anemia. The emphasis on maternal education increases the awareness of mother regarding nutrition, contraception, birth spacing and compliance to medical advice. Joint medical and social efforts are required for overall improvement of living status of women. Iron and folic acid deficiency anemia is the most common in pregnancy, therefore adequate iron and folic acid prophylaxis is a must.

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Prevalence of Depression among the Medical Students in Nepalgunj Medical College

Yadav BK[1], Shah GJ[1], Yadav R[2], Mahat R[3], Joshi A[3]

ABSTRACT

Introduction: Mental health is an important aspect of overall health of a person. Depression is a common mental health problem all around the world. According to WHO, as many as 350 million people suffer from depression all over the globe. Medical studies are well known to be stressful for students and psychological problems like depression are quite common among medical students. Although many studies are done on mental health of students worldwide, studies on depression among medical students of Nepal are quite few. **Aims:** To find out the prevalence of depression among medical students in Nepalgunj Medical College .**Methods:** A descriptive study was done in the batch of 2016 with a Beck's Depression Inventory (BDI) Questionnaire. **Results:** The prevalence of depression among the study subjects was found to be 25.9%. Bullying was found to be a strong factor responsible for depression among medical students. **Conclusion:** Depression was highly prevalent among the medical students. Students who were bullied and had appropriate pocket money suffered from higher levels of depression.

Keywords: Bullying, Depression, NGMC

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INTRODUCTION

Mental health refers to cognitive, emotional and behavioral well being[1] and is important at every stage of life. The status of mental health significantly affects a person's thinking, mood and behavior.[2]Depression is a mood disorder involving a persistent feeling of sadness and loss of interest and affects people of all age groups.[3]Anxiety is a feeling of mild or severe unease, such as worry or fear.[4] American Psychological Association defines anxiety as an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure.[5]According to WHO, Depression occurs globally, affecting an estimated 350 million people. It is a serious health issue responsible for about 800,000 suicides per year.[6] People with anxiety disorders can develop depression later on.[7]

Study of Medicine is a difficult and demanding job and requires continuous hard work and dedication. The overall environment in medical colleges is stressful and generally has a negative impact on psychological health of medical students.[8] Many studies suggest that medical students generally have higher levels of depression compared to the general population.[8, 9, 10] Various factors like academic burden, competition among peers and substance abuse have shown significant association with depression among the medical students.[8,11] Some studies also show higher level of depression in female students compared to male students.[9,12,13] Increased use of social media has been found to increase stress levels and also the odds of having depression.[14,15,16,17] This study aims to find the prevalence of depression among the medical students of Nepalgunj Medical College.

METHODS

A descriptive cross-sectional study was done among the students of Batch 2016. They were given a Beck's Depression Inventory (BDI) Questionnaire individually which was filled up personally on July 30, 2018. Out of 116 students in the batch, 112 were present in the community medicine class and data was collected from them.

Beck's Depression Inventory consists of 21 questions each of which contains 4 options. Each option has a score of 0, 1, 2 or 3. At last, the total score is calculated and evaluated according to the scale below.

Total Score	Levels of Depression
1-10	These ups and downs are considered normal
11-16	Mild mood disturbance
17-20	Borderline clinical depression
21-30	Moderate depression
31-40	Severe depression
Over 40	Extreme depression

RESULTS

A total of 116 questionnaires were distributed to the students, out of which 112 returned them complete. This gives a response rate of about 96.5%. Figure 1 resembles that out of 112 respondents, 65 were males and 47 were females. The age range of students was 18-27 years with mean age of 20.7 years and standard deviation of 1.36. More than half of the students were Nepalese (71.4%) followed by Indians (28.6%).

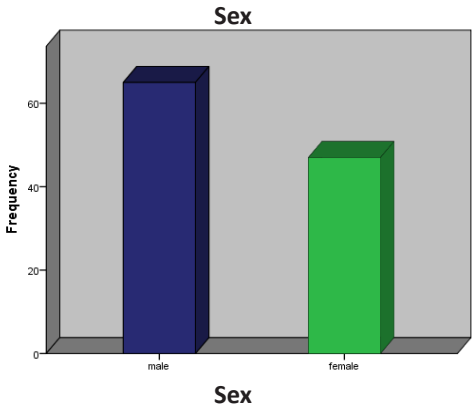

Figure 1: Sex Distribution.

The prevalence of depression in the study group was found to be 25.9%. Among them, 10.7% students were in borderline clinical depression, 11.6% of them had moderate depression while 1.8% had severe and 1.8% had extreme depression as illustrated in Figure 2.

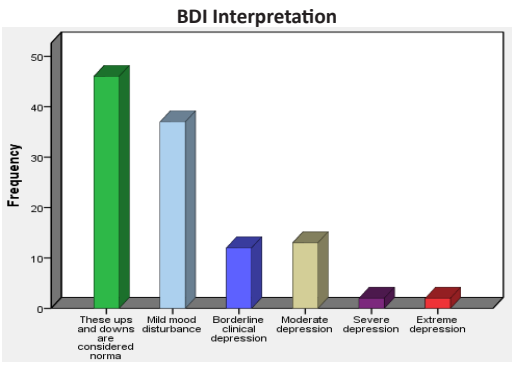

Figure 2: Level of Depression among Study Subjects.

77.7% students responded that they had been bullied by seniors, teachers or staffs in medical college as shown by Figure 3. Students who had faced bullying had higher levels of depression as illustrated in Figure 4.

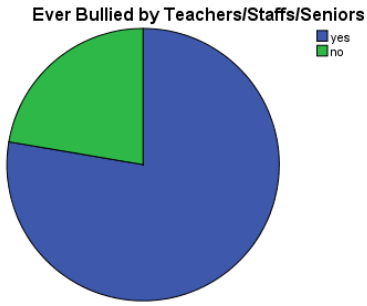

Figure 3: Ever bullied by Teachers/Staffs/Seniors.

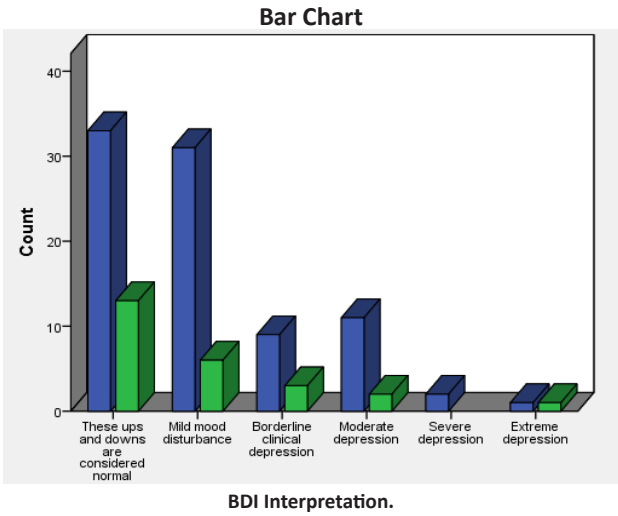

Figure 4: Relationship between Bullied Status and Level of Depression.

Figure 5 shows that 93.8% students responded that they had appropriate pocket money.

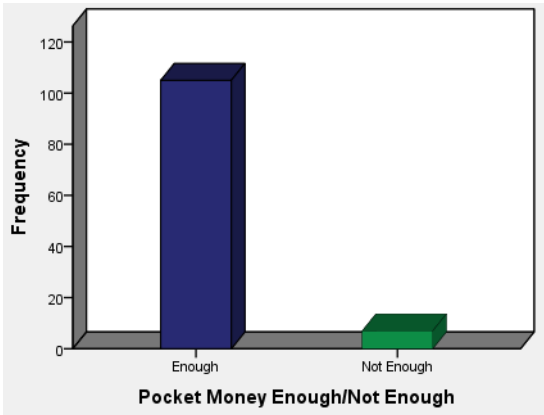

Figure 5: Enough Pocket Money among Study Subjects.

Students who had appropriate pocket money had higher levels of depression than those who had insufficient amount of pocket money as illustrated in Table I.

	Pocket Money		Total
	Enough	Not Enough	
These ups and downs are considered normal	44	2	46
Mild mood disturbance	33	4	37
Borderline clinical depression	12	0	12
Moderate depression	12	1	13
Severe depression	2	0	2
Extreme depression	2	0	2
Total	**105**	**7**	**112**

Table I: Relationship between enough pocket money and depression levels.

Only 28.6% students responded that they had been in love while 71.4% students responded that they had never been in love as shown in Figure 6.

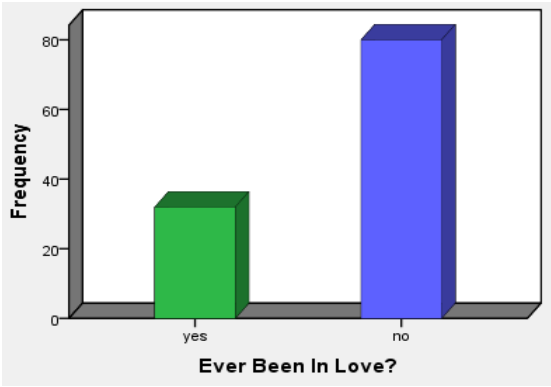

Figure 6: Ever Been in Love?

The students who responded that they had been in love at least once in life had lower levels of depression than those who had never been in love as shown in Table II.

	Ever Been in Love?		Total
	Yes	No	
These ups and downs are considered normal	10	36	46
Mild mood disturbance	16	21	37
Borderline clinical depression	2	10	12
Moderate depression	2	11	13
Severe depression	1	1	2
Extreme depression	1	1	2
Total	**32**	**80**	**112**

Table II: Relationship between relationship status and depression levels.

DISCUSSION

The prevalence of depression was (25.9%), this result is consistent with the results of similar studies done in BPKIHS (29.78%).[18] A study done among medical students in Seoul, Korea showed the prevalence rate of 37.1%[19] of depression which is slightly greater than ours. The results showed that the depression was more prevalent among Nepalese students than Indians. Both males and females had similar depression levels in our study. However many other studies have suggested that females tend to be more depressed than males.[9, 12, 13] Another finding shows higher level of depression in students who were bullied in college. This finding is similar to that of a study done in Pakistan which reported that 66% of students had faced bullying[20]. Similarly, another study done among final year students of six different medical colleges in Pakistan also reports that 52% of the participants had faced some form of bullying during their medical education[21]. A study done in Finland also suggests higher anxiety and stress levels in university students who have been a victim of past or current bullying[22].

The prevalence of depression was found to be more in the students who said they had appropriate pocket money than those who said the pocket money was insufficient. Among the students who had appropriate pocket money, 26.6% had depression, out of which 11.4% had borderline clinical depression, 11.4% had moderate depression, 1.9% had severe depression and 1.9% had extreme depression. Only 14.3% of the students who did not have appropriate pocket money had depression. This finding is consistent with the finding of a study done in Jimma University, Ethiopia[23] which also reports students having adequate pocket money having higher levels of depression. The findings showed that students who responded to have been in love at least once in life had lower levels of depression than those who responded to never have been in love. Out of the students who were not involved in a relationship, 28.75% had depression among which 12.5% had borderline clinical depression, 13.75% had moderate depression, 1.25% had severe depression and 1.25% had extreme depression. Only 18.75% of the students who were in love at least once in life had depression. However, this finding is inconsistent with the findings of a study which suggests that being involved in a romantic relationship was associated with depression.[24] Also, another study reported that romantic involvement was associated with greater depressive symptoms.[25]

LIMITATIONS

The study being conducted only among medical students of NGMC might not be applicable to the wider general population and students of other faculties. Also the picture of clinical status of depression might be slightly different in other batches or groups of students. However, this study provides a basic picture of depression status in medical students and helps to assess the situation among them.

CONCLUSION

Depression was highly prevalent among the medical students. Students who were bullied and had appropriate pocket money suffered from higher levels of depression.

Proper addressing should be done in very first years of medical study to help lower the prevalence. Adequate counseling and guidance from the early years can help solve the problem. Parents should also make sure their children are using their pocket money in a proper way.

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ORIGINAL ARTICLE

Hypoxic Ischemic Encephalopathy in Neonates with Birth Asphyxia - A Hospital Based Study

Adhikari J[1], Paudel D[2]

ABSTRACT

Introduction: Each year approximately 4 million babies are born asphyxiated, which results in 1 million deaths and an equal number of serious neurological sequelae. One of the commonest organs involved in birth asphyxia is brain which may lead to a syndrome of clinical manifestation called Hypoxic Ischemic Encephalopathy (HIE). **Aims:** To find out possible maternal and neonatal risk factors for Hypoxic Ischemic Encephalopathy, to analyze clinical presentations and outcome of HIE in asphyxiated newborns. **Methods:** Hospital based observational study was carried out among fifty newborns with Apgar score less than 7 at 1 minute of life admitted in Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke. **Results:** The incidence of birth asphyxia and birth asphyxia with HIE were 37.2 per 1000 live births and 14 per 1000 live births with male: female ratio of 1.27:1. Most of the neonates 22(44%) were in HIE stage II. Meconium stained amniotic fluid 18 (36%) was the most common intrapartum risk factor followed by maternal use of intrapartum medications 14 (28%), Premature Rupture of Membrane (PROM) 8 (16%), prolonged labor 5 (10%) and obstructed labor 6 (12%). Four (8%) asphyxiated neonates with HIE had cord prolapse and 7 (14%) had cord around the neck. The most common resuscitation done was bag and mask ventilation (56%) ($P<0.05$). Majority of the studied neonates were of normal birth weight (76%) and head circumference (84%) ($P<0.05$) with clinical presentations of respiratory distress (88%), seizures (44%), apnea (22%), bradycardia (8%), tachycardia (6%) and bulged anterior fontanel (6%). The overall mortality of neonates with HIE was 20% of which most were of HIE stage III. **Conclusions:** Certain measures could be taken to prevent birth asphyxia: early detection and intervention of high risk pregnancy, prompt and effective resuscitation of asphyxiates newborns.

***Keywords*:** Birth asphyxia, Hypoxic ischemic encephalopathy, Neonates

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INTRODUCTION

Birth asphyxia is a serious clinical problem worldwide. Each year approximately 4 million babies are born asphyxiated, which results in 1 million deaths and an equal number of serious neurological sequelae, such as cerebral palsy, mental retardation, and epilepsy.[1] Birth Asphyxia is defined by World Health Organization (WHO) as "the failure to initiate and sustain breathing at birth." The Neonatology forum of India has defined birth asphyxia as "gasping and ineffective breathing or lack of breathing at one minute after birth.[2] National neonatology forum of India and WHO use an Apgar Score of 0-3 and 4-7, at one minute, to define severe and moderate asphyxia respectively.[3] Essential criteria to diagnose perinatal asphyxia in newborns by The American Academy of Pediatrics Committee on newborn includes prolonged metabolic or mixed academia (pH<7.0), Apgar score of 0-3 for > 5 mins, and neurological manifestations (seizure, hypotonia, coma, HIE) and evidence of multiorgan dysfunction in immediate neonatal period.[3] However, there is no gold standard test for birth asphyxia. According to Nepal Demographic Health Survey (NDHS) 2011, most of the births (72%) in Nepal occur at home, or during transport on the way to hospital. Also most of the births in Nepal are unattended (64%). This leads to the increased risk of birth asphyxia and neonates are brought to the hospital in moribund stage.[4] Risk factors for causing birth asphyxia in newborn are antepartum, intrapartum and postpartum in 50%, 40% and 10% of cases respectively.[5] The evaluation of risk factors for asphyxia can help identify fetuses at risk of birth asphyxia.

METHODS

A hospital based observational study was carried out among fifty newborns with Apgar score less than 7 at 1 minute of life that were admitted to neonatal intensive care unit (NICU) from labor room and obstretic ward of Nepalgunj Medical college Teaching Hospital, Kohalpur, Banke over the period of one year from February 2019 to January 2020. Newborn babies with Apgar score less than 7 at 1 minute of life were included in the study whereas those mothers not willing to participate delivered outside NGMCTH, neonates with congenital anomalies were excluded from the study. Apgar score was taken immediately after birth at one and five minutes of life. The newborns with Apgar score less than 7 in 1 minute of life were enrolled in the study. Informed written consent from the mother or the attendant of each case was taken. Maternal history was taken and information was documented on the predesigned proforma. Grading of asphyxiated newborn babies with HIE was done according to Levene classification for HIE.[3] Appropriate data entry and statistical analyses were performed on Microsoft Excel and SPSS version 20.0. Data was summarized using descriptive statistics. Chi Square Test and Fischer Exact Test were used to compare the association among two or more categorical variables. P-value of <0.05 was taken as statistically significant. The study was aimed to find out possible maternal and neonatal risk factors for Hypoxic Ischemic Encephalopathy (HIE) and to analyze clinical presentations, outcome of HIE in asphyxiated newborns.

RESULTS

During the study period there were 3978 live births in Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke. Among them 778 (19.5%) neonates were admitted in NICU. Out of 778 neonates, 148 (19%) neonates had birth asphyxia. Among the asphyxiated newborns 56 (37.83%) developed HIE. The incidence of birth asphyxia and birth asphyxia with HIE were 37.2 per 1000 live births and 14 per 1000 live births respectively. Out of 56 asphyxiated newborns with HIE only 50 were included in the study. Six babies were not included in the study because consent was not given by the parents for 3 babies and 3 babies died shortly after birth. Among 50 newborns with HIE, 28 (56%) were males and 22 (44%) females with Male: Female ratio 1.27:1.

HIE Grading	Frequency (n)	Percent (%)
HIE I	16	32
HIE II	22	44
HIE III	12	24
Total	**50**	**100**

Table I: Grading of HIE according to Levene Classification (n=50).

Most of the neonates (44%) in the study were in HIE stage II, followed by HIE stage I (32%) and HIE stage III (24%) respectively.

Risk Factors	Frequency (n)	Percent (%)
General Anesthesia during LSCS	5	10
Spinal Anesthesia during LSCS	11	22
PROM	8	16
Prolonged Labor	5	10
Obstructed Labor	6	12
Cord Prolapse	4	8
Cord around Neck	7	14
MSAF	18	36
Intrapartum Medications	14	28
Intrapartum Fever	6	12
Chorioamniotis	1	2

*MSAF: Meconium Stained Amniotic Fluid.

Table II: Risk Factors for the Asphyxiated Newborns with HIE (n=50).

The most common intrapartum risk factor in asphyxiated newborns with HIE was meconium stained amniotic fluid which was present in 18 (36%) mothers. Maternal use of intrapartum medications, Premature Rupture of Membrane (PROM), prolonged labor and obstructed labor were present in 14 (28%), 8 (16%), 5 (10%) and 6 (12%) mothers respectively. Four (8%) asphyxiated neonates with HIE had cord prolapse and 7 (14%) studied neonates had cord around the neck.

Mode of Resuscitation	Frequency (n)	Percent (%)
Stimulation	14	28
BMV	28	56
ET-IPPV	4	8
ET-IPPV, CC	2	4
ET-IPPV, CC, Adrenaline	2	4
Total	**50**	**100**

*ET-IPPV: Endotracheal Tube- Intermittent Positive Pressure Ventilation, CC: Chest Compression, BMV: Bag Mask Ventilation.

Table III: Mode of Resuscitation in newborns with HIE (n=50).

All the neonates 50 (100%) required one or other form of neonatal resuscitation at birth. In the study, stimulation and BMV were required in 28% and 56% of cases respectively. ET-IPPV, ET-IPPV with chest compression and Et-IPPV with chest compression and adrenaline was required in 4 (8%), 2 (4%) and 2 (4%) neonates respectively.

Mode of Resuscitation	HIE Grading			Total	P Value
	HIE I n(%)	HIE II n(%)	HIE III n(%)		
Stimulation	8 (51.7%)	6 (42.9%)	0 (0%)	14 (100%)	0.012
BMV	7 (25%)	14 (50%)	7 (25%)	28 (100%)	
ET-IPPV	1 (25%)	0 (0%)	3 (75%)	4 (100%)	
ET-IPPV, CC	0 (0%)	1 (50%)	1 (50%)	2 (100%)	
ET-IPPV, CC, Adrenaline	0 (0%)	1 (50%)	1 (50%)	2 (100%)	
Total	**16 (32%)**	**22 (44%)**	**12 (24%)**	**50 (100%)**	

*ET-IPPV: Endotracheal Tube- Intermittent Positive Pressure Ventilation, CC: Chest Compression.

Table IV : Association of Mode of Resuscitation with Severity of HIE (n=50).

Most neonates who required simpler mode of resuscitation had HIE I and HIE II whereas the neonates who required extensive neonatal resuscitation care had HIE III. Association of mode of resuscitation at the birth with the severity of HIE was statistically significant (p<0.05).

Anthropometry	Frequency (n)	Percent (%)	Mean (± S.D)
Birth Weight			2695.4 (±483.457) gm
<1500 gm	0	0	
1500 gm-2499 gm	12	24	
2500gm-4000gm	38	76	
>4000gm	0	0	
Head Circumference			32.94(±1.284) cm
<32 cm	7	14	
32-35 cm	42	84	
>35 cm	1	1	

Table V: Distribution of Anthropometric Measurements (n=50).

The above data shows twelve (24%) neonates were of Low Birth Weight (LBW) and remaining 38 (76%) were of normal birth weight with mean (±S.D) 2.69(±0.483) Kg. There was no neonate with birth weight less than 1500 gm. Head circumference ranged from 30 to 36 cm with mean (±S.D.) 32.94(±1.284) cm.

Anthropometic Variables	HIE Grading			Total n (%)	P Value
	HIE I n (%)	HIE II n (%)	HIE III n (%)		
Birth Weight					0.008
<2500 gm	0 (0%)	9 (75%)	3 (25%)	12 (100%)	
2500-4000 gm	16 (42.1%)	13 (34.2%)	9 (23.7)	38 (100%)	
Head Circumference					0.05
<32 cm	0 (0%)	6 (85.7%)	1 (14.3%)	7 (100%)	
32-35 cm	16 (38.1%)	15 (35.7%)	11 (26.2%)	42 (100%)	
>35 cm	0 (0%)	1 (100%)	0 (0%)	1 (100%)	

Table VI: Association of Anthropometric Measurements with Severity of HIE (n=50).

In the study, association of birth weight and head circumference of the asphyxiated neonate with the severity of HIE was statistically significant (P<0.05).

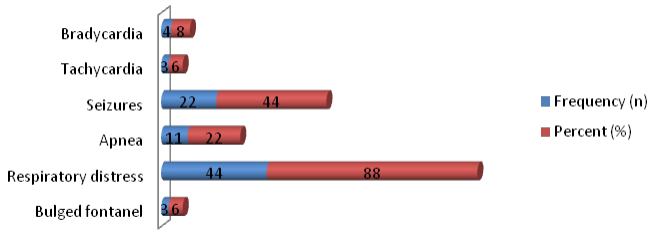

Figure 1. Clinical Profile of Asphyxiated Neonates with HIE (n=50).

In this study, 44 (88%) had respiratory distress, 22 (44%) had seizures, 11 (22%) had apnea and 3 (6%) had bulged anterior fontanel. Tachycardia and bradycardia was present in 3 (6%) and 4 (8%) neonates respectively.

Immediate Outcome	HIE Grading		
	HIE I n (%)	HIE II n (%)	HIE III n (%)
Recovered	16 (100%)	19 (86.4 %)	3 (25%)
Died	0 (0%)	2 (9.1%)	8 (66.7%)
Referred	0 (0%)	1 (4.5%)	0 (0%)
LAMA	0 (0%)	0 (0%)	1 (8.3%)
Total	**16 (100%)**	**22 (100%)**	**12 (100%)**

*LAMA: Leave Against Medical Advice.

Table VII: Immediate Outcome of the Asphyxiated Newborns with HIE (n=50).

The above table shows that all of the asphyxiated neonates with HIE I and most of the neonates with HIE II recovered but majority of the neonates with HIE III died.

DISCUSSION

The incidence of birth asphyxia and HIE in present study was 37.2 and 14 per 1000 live births which was comparable to the studies done by Ramya C et al[7] and Chandra S et al[8] respectively. In the present study, male to female ratio was 1.27:1. Many other studies of asphyxiated newborns with HIE also showed the male predominance over female. [9, 10, 11] Among different HIE classification systems, Levene classification of HIE was used in this study because of its applicability in resource constraint settings like ours. Most of the neonates (44%) in the study were of HIE stage II followed by HIE stage I (32%) and HIE stage III (24%). Koreti S et al[12] and Shah GS et al[13] also found that most of the asphyxiated neonates with HIE were of HIE stage II. Meconium Stained Amniotic Fluid (MSAF), the commonest intrapartum risk factor for birth asphyxia in the present study, was present in 36% patients which was similar to other studies.[6,14] MSAF is an indicator of fetal distress and

its detection warrants immediate delivery by available means to prevent birth asphyxia and thus HIE. In the present study cord around the neck was present in 7 (14%) neonates and cord prolapse in 4 (8%) neonates. Maetinez-Biarze M et al[11] and Palsdottir K et al[15] found a significant association of cord around neck at birth with birth asphxia. Cord prolapse leads to the abrupt cessation of oxygen supply to the fetus and results in birth asphyxia. Premature Rupture of Membrane (PROM) was present in 16% cases in the present study. Many other studies have shown significant association of PROM with birth asphyxia.[11, 16, 17, 18] Many studies have established prolonged labor as an independent risk factor for birth asphyxia.[8, 16, 18] Ten percent mothers in this study had prolonged labor. In the present study obstructed labor was present in 12% cases among asphyxiated neonates with HIE which was similar to the study by Mohan K et al.[19] Intrapartum maternal fever was present in 12% which is similar to the study done by Aslam HM et al.[16] Chorioamnotis was present in only one (2%) mother of the studied neonates. Association of maternal fever and chorioamniotis with birth asphyxia could be attributed to the inflammatory pathways involving cytokines and chemokines which is common to all these processes.[16] In this study 8% of mother's labor was augmented by oxytocin which was consistent with the finding of Futrakul S et al.[10] Sustained uterine contraction due to the use of oxytocin could interfere with the fetal blood supply increasing the risk of birth asphyxia. All the infants in this study required one or other form of resuscitation at birth. Most of the asphyxiated newborns (56%) were resuscitated by Bag and Mask Ventilation (BMV) whereas only 28% were resuscitated by stimulation, 8% by endotracheal tube positive pressure ventilation, 4% by endotracheal tube positive pressure ventilation and chest compression, and 4% by endotracheal tube positive pressure ventilation, chest compression and adrenaline. BMV was the most common mode of resuscitation in various studies and it could have been so because it is recommended not to waste too much time in providing tactile stimulation to the asphyxiated neonates at birth during resuscitation.[3,20] The mean weight of the studied neonates in this study was 2.69 (±0.403) kg. This finding was similar to other studies where most of the asphyxiated neonates had normal weight.[17, 20] Eighty-eight percent of studied neonates in the present study had respiratory distress which was high compared to other studies.[17,19] High incidence of respiratory distress in the neonates with HIE in this study could be explained by the fact that meconium stained amniotic fluid was the commonest intrapartum risk factor for birth asphyxia in this study. Seizure was present in 44% of the studied neonates in this study. Similar occurrence rate of seizure in neonates with HIE has been documented in different studies.[7,19,21] In birth asphyxia seizures occur due to cerebral edema, Na/ K pump failure and metabolic complications like hypoglycemia and hypocalcemia. The incidence of apnea was 22% among the studied neonates in this study which was similar among the neonates with HIE in various studies.[19,21] Mohan K et al[19] and Shah GS et al[23] reported full anterior fontanel in 11% and 10% neonates with HIE which were higher compared to the present study (6%). Raised intracranial pressure secondary to cerebral edema in asphyxiated neonates leads to bulging fontanel. The overall mortality of the asphyxiated newborns with HIE in this study was 20% which was similar to the study done by Gupta SK et al[20] and Dongol S et al[23] In the present study mortality in HIE stage I (0%), HIE stage II (9.1%) and HIE stage III (66.7%) which was similar with the studies done by various authors.[20, 24]

LIMITATIONS

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

CONCLUSION

Incidence of birth asphyxia and birth asphyxia with HIE in this study were 37.2 per 1000 live births and 14 per 1000 live births respectively with male: female ratio of 1.27:1. Most of the neonates were in HIE stage II 22 (44%).16 (32%) were in HIE stage I whereas 12 (24%) were in HIE stage III Meconium stained amniotic fluid 18 (36%) was the most common intrapartum risk factor. All the neonates with HIE got one or other form of neonatal resuscitation, commonest being bag and mask ventilation (56%) ($P<0.05$). Majority of the studied neonates were of normal birth weight (76%) and head circumference (84%) ($P<0.05$) with clinical presentations of respiratory distress (88%), seizures (44%), apnea (22%), bradycardia (8%), tachycardia (6%) and bulged anterior fontanel (6%). The overall mortality of neonates with HIE was 20% of which most were of HIE stage III.

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Hearing Status After Cartilage Augmented Type III Tympanoplasty: In Chronic Otitis Media Squamous Type

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ABSTRACT

Introduction: Tympanoplasty is typically performed in conjunction with a canal wall down mastoidectomy in patient with Chronic Otitis Media Squamous. The results from experimental and clinical studies of the type III stapes columellar reconstruction have shown that interposing a disk of cartilage between the graft and the stapes head improves hearing in the lower frequencies by 5 to 10 dB. They hypothesize that the cartilage acts to increase the "effective" area of the graft that is coupled to the stapes, which leads to an increase in the middle ear gain of the reconstructed ear. **Aims:** To assess the hearing improvement after cartilage augmented Type III Tympanoplasty in chronic otitis media squamous disease **Methods:** This study was conducted in 44 patients with Chronic Otitis Media squamous in the patients attending the department of Otorhinolaryngology in NGMC teaching hospital from November 2018 to March 2020. Canal Wall Down mastoidectomy with cartilage augmented type III Tympanoplasty and was done. Augmentation was done with thin 3-4 mm conchal cartilage interposed between stapes and Temporalis fascia graft. **Results:** There were 11(25%) male and 33(75%) female, with mean age of 29.48 years, ranging from minimum of 15 years to maximum 56 years. The preoperative mean A–B gap was 21.82 and postoperatively means AB gap was 12.20 dB with overall AB gap gain was 9.64 dB. **Conclusion:** Significant hearing improvement is seen in Canal Wall Down mastoidectomy Chronic Otitis Media squamous after cartilage augmented type III tympanoplasty.

Keywords: Chronic Otitis Media (COM), CWD Mastoidectomy ABG, Squamous, Tympanoplasty

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INTRODUCTION

Chronic suppurative otitis media is characterized by intermittent or persistent, chronic purulent drainage through a perforated tympanic membrane and can be associated with cholesteatoma. On occasion, a permanent, central perforation of the tympanic membrane can remain dry, with only rare intermittent drainage, that is, inactive chronic otitis media.[1] According to survey done by BRINOS, and IOM Teaching Hospital, 2.7 million out of the population of 19 million were significantly deaf.

The term tympanoplasty was 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.[2] The goal of tympanoplasty is to restore sound pressure transformation at the oval window by coupling an intact tympanic membrane with a mobile stapes footplate via an intact or reconstructed ossicular chain and to provide sound protection for the round window membrane by means of a closed, air-containing, mucosa-lined middle ear.[3]

The hearing results after a classic type III tympanoplasty is vary widely, with airbone gaps ranging from 10 to 60 dB. The results from experimental and clinical studies of the type III stapes columellar reconstruction have shown that interposing a disk of cartilage between the graft and the stapes head improves hearing in the lower frequencies by 5 to 10 dB. They hypothesize that the cartilage increase the "effective" area of the graft that is coupled to the stapes, which leads to an increase in the middle ear gain of the reconstructed ear.[1]

METHODS

The present prospective study was conducted in the Department of Otorhinolaryngology, Nepalgunj Medical College & Teaching Hospital Nepalgunj, Banke from November 2018 to March 2020. The total number of cases included in

the study was 44 with COM Squamous type with both genders. Patients with complication and poor hearing result are not included on study. A detailed history followed by general physical and detailed ENT examination was done in all patients and diagnosis recorded. Pre-operative 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 and ossicular status, middle ear epithelization and status of attic region.

Written and informed consent was taken before surgery. Ethical clearance was obtained from Institutional Review Committee, Nepalgunj Medical College and Teaching Hospital. Canal Wall Down mastoidectomy with cartilage augmented type III Tympanoplasty was done. Augmentation was done with thin 3-4 mm conchal cartilage interposed between stapes and Temporalis fascia graft. 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

The study was conducted in the department of ENT in Nepalgunj Medical College and Teaching Hospital of 44 patients with established chronic otitis media inactive .11(25%) were males and 33(75%) females. Their ages ranged from 15 year to 56 years with mean age was 29.48± 11.28 years. Patients in the age group of <20 years were 11 (25%), followed by 21-30 were 15(34.1%), 31-40 were 10(22.7%), 41-50 were 5(11.4%) and >50 were 3(6.8%).

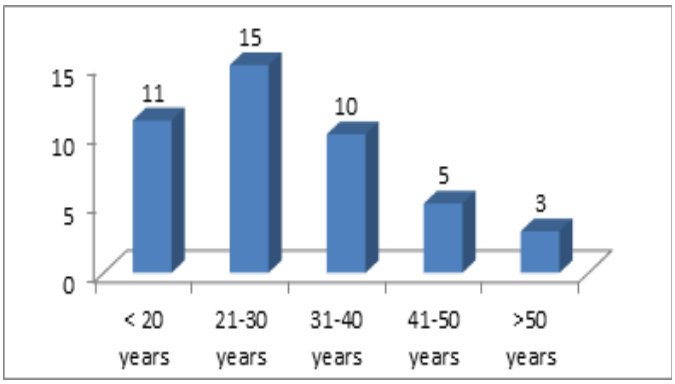

Figure 1: Age Distribution.

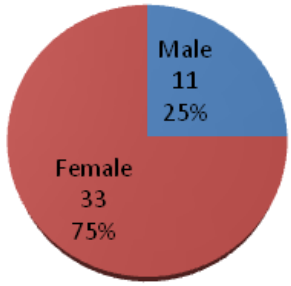

Figure 2: Sex Distribution.

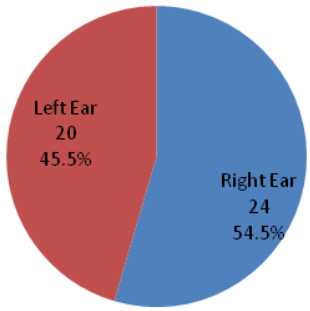

Figure 3: Laterality.

Figure 3 show that right ear involvement was seen in 24(54.5%) cases. The left ear was seen to be involved in 20(45.5%) of the cases. Out of the 44 cases, the disease was unilateral in 33(75%) patients and bilateral in 11(25%) patients.

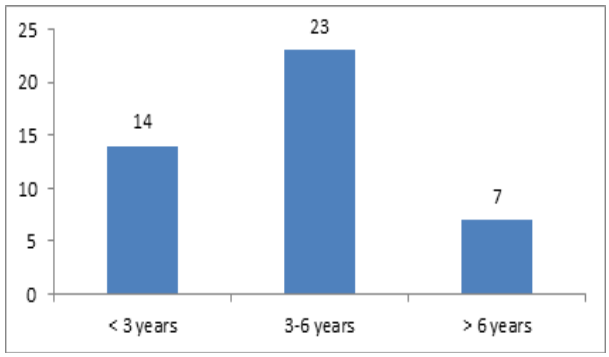

Figure 4: Duration of Ear Discharge.

In maximum number of patients, 23(52.3 %), the duration of ear discharge was 3–6 years, followed by 14(31.8%) and 7(15.9 %) of the patients where the duration was seen to be <3 and >6 years respectively (Figure 4).

The preoperative AC threshold was (39.93±6.37dB) for patients undergone surgery. In present study preoperative mean A–B gap was (21.82 ±3.68dB).Postoperatively AC hearing threshold was (26.93 ±1.89dB) and average gain in air conduction threshold was (13.07 ±6.79dB) in patients who had undergone augmented type III tympanoplasty. In this study preoperative mean A–B gap was (21.82 ±3.68 dB). Postoperatively mean AB gap was (12.20±2.29dB). Overall AB gap gain was (9.64 ± 3.96dB). These differences were statistically significant when applied paired-samples t test.

Group		P-value
Pre-op AC Threshold	39.93 ±6.37	0.000
Post-op AC Threshold	26.93 ±1.89	
AC Threshold gain	13.07 ±6.79	

Table I: Post-op Audiological Assessment (AC Threshold).

Group		P-value
Pre-op A-B Gap	21.82 ±3.68	0.000
Post-op A-B Gap	12.20 ±2.29	
A-B Gap gain	9.64 ± 3.96	

Table II. Post-op Audiological Assessment (A-B Gap).

DISCUSSION

In the present study, 44 patients in the age group of 15–56 years with mean age 29.48 years of either sex were selected. Pure tone audiometery was done to assess hearing loss before and 3 month after surgery. The mean age was 29.48 years with maximum number of patients 15 being between the age group of 21–30 years followed by 11 patients between age group <20 years, 10 patients between age group 31-40 years, 5 patients between agroup 41-50 years and 3 patients in >50 years. Similar studies done by Kyrodimos et al and Shrestha et al, the mean age of presentation was also 32.4 and 24.8 years respectively.[4,5] In present study there was female preponderance as compared to male patients. Overall 33(75%) were females while rest 11(25%) patients was males. The right ear involvement was seen in 24(54.5%) cases. The left ear was seen to be involved in 20(45.5%) of the cases. Out of the 44 cases, the disease was unilateral in 33(75 %) patients and bilateral only in 11(25 %) patients.

Duration of Ear Discharge

The duration of ear discharge ranged from 2 years to 9 years. Maximum number of patients, that were 23(52.3 %) cases, had duration of ear discharge of 3-6 years fallowed by14(31.8%) patients gave history of ear discharge for a duration of < 3 year and 7(15.9 %) had a history of ear discharge of >6 years. In a study conducted by goyal et al. 100 % of the patients presented with a history of ear discharge.[6] Longer duration of ear discharge shows lack of awareness about the disease and its complications.

Hearing Improvement

The preoperative AC threshold was (39.93±6.37dB) and mean A–B gap was (21.82 ±3.68dB). Postoperatively AC hearing threshold was (26.93 ±1.89dB) with average gain in AC threshold was (13.07 ±6.79dB) in patients who had undergone augmented type III tympanoplasty. The preoperative mean A–B gap was (21.82 ±3.68 dB) and postoperatively means AB gap was (12.20±2.29dB) with overall AB gap gain was (9.64 ± 3.96dB). This was seen to be statistically significant up to a level of 5%. This result is consistent with the study done by kyrodimos et al[4] where pre and post-operative PTA-ABG were 35.41 and 24.33 respectively. Merchant et al[7] was found mean ABG of 10-25 db in aerated middle ear with variable ABG in non-aerated ear. In the study, conducted by Shrestha et al[5] the hearing gain in patients underwent cartilage augmented type II Tympanoplasty was 7.7 dB. A comparative study, conducted by Cheang et al.[8] In his between myringolenticulopexy and myringostapediopex, the mean post-operative air-bone gaps in the two groups were 17.5 and 24.7 dB, respectively. Similarly Moustafa and Khalifa[9] in their tympano-cartilago-stapediopexy were performed in the other 95 cases, achieved ABG of less than 20 dB. Malafronte G et al[10] in cases of double-cartilage block ossiculoplasty, One year after surgery, a postoperative ABG of 20 dB or less occurred in 80% (n = 20) of patients of Group 1 and in 84.3% (n = 27) of patients of Group 2. After a mean follow-up of 7 years, a postoperative ABG of 20 dB or less occurred in 48% (n = 12) of patients in the first group and in 81% (n = 26) of patients in the second group the ABG of 20 dB or less achieved. In our study the overall AB gap gain was 9.64dB.

Study	Pre op A-B gap	Post op A-B gap	Net gain
Present study	21.82 dB	12.20 dB	09.64 dB
Kyrodimos et al	35.41 dB	24.33 dB	11.09 dB
Shrestha et al	37.4 dB	29.7 dB	07.7 dB

Table 3: Hearing improvement.

LIMITATIONS

To establish strong indication and statistical significance about role of the hearing improvement after cartilage augmented Type III Tympanoplasty in management of mastoidectomy, it requires large sample size and multicenter study.

CONCLUSION

Depending on our observation we concluded that hearing improvement is seen in Canal Wall Down mastoidectomy COM squamous after cartilage augmented type III tympanoplasty. However it needs to be compared with conventional type III tympanoplasty with Temporalis fascia alone, with cartilage augmented type III tympanoplasty. To establish strong indication and statistical significance about role of mastoidectomy, it requires large sample size and multicenter study.

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Role of Fine Needle Aspiration Cytology in Extrapulmonary Tuberculosis

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ABSTRACT

Introduction: Extrapulmonary tuberculosis is equally important as that of pulmonary tuberculosis. Fine needle aspiration cytology (FNAC) is accurate, cost effective, minimal invasive outpatient procedure and aids in prompt diagnosis of extrapulmonary tuberculosis. **Aims:** To determine the role of fine needle aspiration cytology for diagnosis of extra pulmonary tuberculosis. **Methods:** This is a hospital based descriptive study done over a period of one and half year April 2019 to October 2020 at Nepalgunj Medical College Teaching Hospital, Nepalgunj, Nepal. All the 80 patients who were clinically suspected for tuberculosis had undergone fine needle aspiration cytology and diagnosed as tuberculosis in cytology were included in study. Cytological diagnosis was made with microscopic features and positive acid fast bacilli staining. Microscopy showed epithelioid histiocytes, granulomas, multinucleated giant cells, caseous necrosis, neutrophils and mature lymphocytes. **Results:** Out of 930 cases received, 80 cases were diagnosed as tuberculosis in cytology. 33 cases were diagnosed with acid fast bacilli positive. Rest was diagnosed with cytological features. Among 80 aspirated samples, a portion of purulent specimen was evaluated with Genexpert test in 11 cases for Mycobacterium Tuberculosis detection and rifampicin sensitivity/ resistant. Out of 11 positive patients in Genexpert tests; 10 were rifampicin sensitive and one was rifampicin resistant. **Conclusion:** Common presentation of extrapulmonary tuberculosis is in lymph nodes with increased frequency in age group of 21 to 30 years. Therefore, lymph nodes in this age group should be prioritized more for investigation of extrapulmonary tuberculosis.

***Keywords*:** Extrapulmonary tuberculosis, fine needle aspiration cytology

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INTRODUCTION

Mycobacterium Tuberculosis (MTB) is a major health problem in developing countries including Nepal.[1] Fine needle aspiration cytology (FNAC) is being commonly used and usually contributes for diagnosis of extrapulmonary tuberculosis.[2] Extrapulmonary tuberculosis remains diagnostic challenges in developing countries and could be easily diagnosed with cytology.[3] Fine needle aspiration cytology (FNAC) is simple and minimally invasive procedure for obtaining aspirated material which can be processed for smear microscopy.[4] Although culture is gold standard diagnosis for extrapulmonary tuberculosis cytology can aid in diagnosis of extrapulmonary tuberculosis.[5] Common presentation of extrapulmonary tuberculosis reveals with peripheral lymph node enlargement and can be evaluated with fine needle aspiration cytological diagnosis.[6]

METHODS

This is a hospital based descriptive study done over a period of one and half year April 2019 to October 2020 at Nepalgunj Medical College Teaching Hospital, Nepalgunj, Nepal. Among 930 cases aspirated at department of Pathology in one and half years; 80 cases were clinically suspected for extrapulmonary tuberculosis. While performing FNAC procedure; relevant clinical history from patient was taken and found to be gradually increasing painless nodular swelling at cervical, axillary, inguinal and skin region associated with on and off history of fever for duration of more than a week. Aspiration was done as an outpatient procedure in supine posture. Aspiration was done with 22 to 23 G needle attached to five ml. syringe. Two to three passes of needle were made per cases. The smears were air dried for Giemsa stain and wet fixed in 95% alcohol for rapid Pap stain. Special stain as Ziehl Neelsen stain was done for acid fast bacilli in aspirated smear. All the

80 cases were diagnosed as extrapulmonary tuberculosis in cytology and were included in study. Cytological diagnosis was made with microscopic features and positive acid fast bacilli staining. Microscopic features in cytology showed collection of epithelioid histiocytes forming granulomas, multinucleated giant cells, caseous necrotic material, lymphocytes and neutrophils.

Inclusion criteria: All age group patient undergone fine needle aspiration cytology followed by diagnosis of extrapulmonary tuberculosis in cytology was included in the study.

Exclusion criteria: Cytological diagnoses other than extrapulmonary tuberculosis were excluded from study. The data were analyzed using Statistical packages in social sciences (SPSS) version18.

RESULTS

Of 930 patients, only a total of 80 patients fulfilled the inclusion criteria for this study. Out of 80 cases, 51 cases (63.7%) were of female as shown in figure 1. Among 80 patients, 33 cases were diagnosed with acid fast bacilli positive in aspirated material and rest was diagnosed with cytological features under microscope. Male to female ratio was of 1:1.76. Age of the patient ranged from 5 month to 75 years as shown in figure 2. Distribution of cases were equal in right and left cervical region of neck as 33, four in submental region of neck, two were of bilateral cervical region of neck, left axilla and left inguinal region; one in right axilla, sternal angle, left foot, and left scapular region. A portion of purulent aspirated sample was kept for Genexpert test in 11 cases. Out of 11 positive patients in Genexpert tests; 10 were rifampicin sensitive and one was rifampicin resistant.

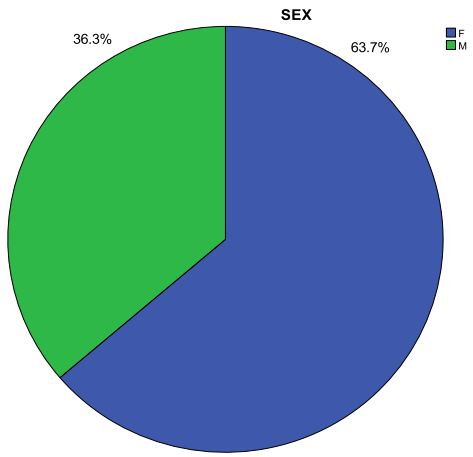

Figure 1: Distribution of patients according to gender.

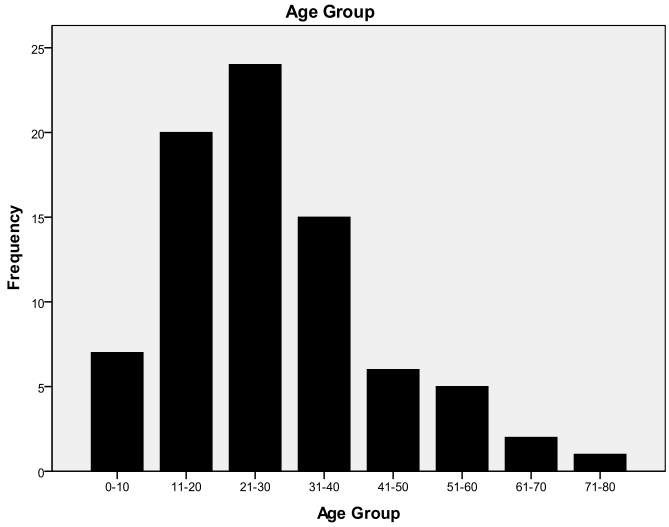

Figure 2: Distribution of patients according to age groups.

One case of tuberculous abscess in right supraclavicular region was diagnosed as acid fast bacilli positive smear with rifampicin resistant in Genexpert test.Out of 80 cases, 77 cases diagnosed as extrapulmonary tuberculosis in cytology were from lymph nodes and only 3 cases diagnosed as extrapulmonary tuberculosis each were from sternal angle region, left foot region and left scapular region.

Cutaneous tuberculosis is one of the rare presentations of extrapulmonary tuberculosis.[7] and three cases of cutaneous tuberculosis were identified in sternal angle, left foot, and left scapular region.

In comparison of fine needle aspiration cytology diagnosis in extrapulmonary tuberculosis with acid fast bacilli (AFB) staining and Genexpert test (as shown in Figure 3); one case of tuberculous abscess in right cervical region of neck was diagnosed only in cytological findings with negative result of Ziehl Neelsen stain for acid fast bacilli revealing past history of antitubercular treatment.

		AFB - TB MTB - DETECTED; RIFAMPICIN - RESISTANT MTB - DETECTED; RIFAMPICIN - SENSITIVE	Genexpert Test NOT DONE			Total
NEGATIVE	FNAC DIAGNOSIS	Suggestive of granulomatous lesion - tuberculous abscess			2	2
		Suggestive of granulomatous lesion - tuberculous lymphadenitis			37	37
		Suggestive of tuberculous abscess			5	5
		Suggestive of tuberculous lymphadenitis			2	2
		Tuberculous abscess			1	1
	Total				**47**	**47**
POSITIVE	FNAC DIAGNOSIS	Cutaneous tuberculosis	0	0	1	1
		Tuberculous abscess	1	10	13	24
		Tuberculous lymphadenitis	0	0	8	8
	Total		**1**	**10**	**22**	**33**

Table I: Fine needle aspiration cytology (FNAC), acid fast bacilli (AFB – TB) and Genexpert test.

DISCUSSION

Involvement of tuberculosis other than lung is considered as extrapulmonary tuberculosis.[8] Although gold standard diagnosis for tuberculosis is culture with Lowenstein Jensen media its major limitation is time consuming of two to four weeks; cytological diagnosis and Genexpert examination are quick and reliable method of diagnosis for tuberculosis.[9] In present study female predominance was found for extrapulmonary tuberculosis and similar finding in fine needle aspiration cytology diagnosis of extrapulmonary tuberculosis were observed by Narang S et al, Rajshekeran et al and Vimal S et al.[10, 11,12]

Present case shows maximum number of extrapulmonary tuberculosis in cervical lymph nodes and similar observation were seen in study done by Samaila MO et al.[2] At a regional hospital in Thailand, study showed lymph nodes as a common location for extrapulmonary tuberculosis (29.6%) [13] and study by Makaju R et al also showed lymph node as common presentation for extrapulmonary tuberculosis (69.1%).[14]

Genexpert can identify bacterial DNA by polymerase chain reaction (PCR) and also aid in treatment of multidrug resistance by identifying rifampicin sensitivity or resistivity to patient.[15] From December 2010, World Health organization (WHO) had validate the use of a new technology as GeneXpert Mycobacterium Tuberculosis/ Rifampicin assay as a replacement over conventional techniques.[16] During October 2013, WHO updated its policy and endorsed the use of newer technique for the rapid detection of TB infection among extra-pulmonary cases.[17] GeneXpert test is semi-automated real-time polymerase chain reaction (PCR) nucleic acid amplification technology, which could concurrently identify mycobacterium tuberculosis and Rifampicin (RIF) resistance in less than three hours.Molecular beacon technology of polymerase chain reaction is the mechanism and principle of GeneXpert system.[18] In this study GeneXpert has advantage of diagnosing rifampicin resistance in one case out of eleven cases and similar findings were obtained in study done by Mechal Y et al.[19] Rifampicin resistance was of 1.25% in Genexpert test and 5.9% was identified in study done by Masenga SK et al.[20] One case of tuberculous abscess in present study was diagnosed only in cytological morphology with absence of acid fast bacilli in Ziehl Neelsen stain and past history of antitubercular therapy. Similar finding was observed in study done by Pandit S et al.[21]

LIMITATIONS

Limitation of this study for diagnosis of extrapulmonary tuberculosis is small sample size in cytology. Another limitation is lack of previous studies in the research area.

CONCLUSION

Common presentation of extrapulmonary tuberculosis is in lymph nodes with increase frequency in age group of 21 to 30 years. Therefore, this age group and lymph nodes should be prioritized more for investigation of extrapulmonary tuberculosis. It is recommended to frequently step up and augment for aspiration cytology with acid fast bacilli stain for the diagnosis of extrapulmonary tuberculosis, which will help in reducing not only the disease burden, but also the cost of diagnosis. This will facilitate the timely management and appropriate treatment of patients to reduce the mortality and morbidity.

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Prevalence and Etiology of Neonatal Jaundice in a Tertiary Care Hospital

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ABSTRACT

Introduction: Neonatal jaundice is a major clinical condition worldwide occurring in upto 60% of term and 80% preterm newborn in the first week of life. Neonatal jaundice is defined as total serum bilirubin level above 7 mg/dl. **Aims**: This study was done to find out the prevalence and etiology of neonatal jaundice in neonates admitted to Neonatal Intensive Care Unit (NICU) of Nepalgunj Medical College Teaching Hospital (NGMCTH) Kohalpur, Banke. **Methods**: It was a prospective cross sectional hospital based study conducted from November 2018 to November 2019 in Neonatal Intensive Care Unit of Nepalgunj Medical College Teaching Hospital. All neonates with clinical jaundice and hyperbilirubinemia with total serum bilirubin of ≥7 mg/dl were subjected to complete history taking, through physical examination and investigations. **Results**: Out of 892 neonates who developed clinical jaundice, 640 neonates whose parents gave consent were included in the study. The prevalence of neonatal jaundice was found to be 39.85% with male to female ratio of 1.79:1. In the present study pathological jaundice was seen in 74.94% whereas physiological jaundice in 23.66%. Among the various etiologies of pathological jaundice, neonatal sepsis (44.52%) was found to be the most common cause followed by ABO incompatibility (12.18%) and Rh incompatibility (7.03%). **Conclusions**: The prevalence of neonatal jaundice in present study was 39.85% and the most common cause was neonatal sepsis .The prevalence of jaundice was more in preterm than in term neonates. Neonatal jaundice is very common morbidity in NICU especially in preterm babies.

***Keywords**:* Etiology, Neonatal jaundice, Prevalence

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INTRODUCTION

Jaundice refers to discoloration of sclera, mucous membrane and skin owing to accumulation of bilirubin in the blood stream which causes yellow pigmentation of plasma, leading to discoloration of heavily perfused tissues.[1] Neonatal jaundice (hyperbilirubinemia) is defined as a total serum bilirubin level above 7 mg/dL.[2] Serum bilirubin level of most new born rises to >2 mg/dl in the first week of life. This level usually rises in full term infants to a peak of 6-8 mg/dl by 3-5 days of age and then falls, this is known as physiological jaundice. Pathologic jaundice is defined as appearance of jaundice within 24 hours after birth and a rapidly rising total serum bilirubin concentration (rise of serum bilirubin levels >0.5mg/dl/hr or more than 5 mg per dL per day).[2] Neonatal jaundice is a major clinical condition worldwide occurring in up to 60% of term and 80% of preterm newborn in the first week of life. Prematurity, low birth weight and infection are the main causes of neonatal jaundice in developing countries.[3] Neonatal jaundice is very common problem in Nepal and responsible for major morbidity of neonates.[4] Bilirubin is potentially toxic to the central nervous system, early detection and appropriate management of neonatal jaundice is of paramount importance to avoid neurological damage to brain of newborn babies which could lead to mental retardation, seizure disorder and cerebral palsy in future. Therefore awareness of prevalence, common causes and risk factors of neonatal jaundice is an important prerequisite to ensure early detection and proper management of neonatal jaundice.

METHODS

A hospital based study was carried out to determine the prevalence and etiology of jaundice in neonates admitted in NICU, NGMCTH Kohalpur from November 2018 to November 2019. Neonates admitted in NICU with clinical jaundice with serum bilirubin ≥7 mg/dl were included for the study. Those

neonates whose parents refused to take part in the study were excluded. Ethical clearance was obtained from Institutional Review Committee, Nepalgunj Medical College and Teaching Hospital, Kohalpur, Banke, Nepal.

Details of neonates in terms of age, sex, birth weight, period of gestation and presenting complains were recorded in predesigned proforma. The family history was recorded regarding recurrent jaundice and jaundice in sibling during neonatal period or later, any history of anemia, blood transfusion, developmental disorders or metabolic disorder among the family members.

Venous blood was taken and investigated for serum bilirubin (total, direct, indirect) and blood group (ABO and Rh) of baby and mother. Sepsis profile (TLC, DLC, CRP, micro ESR, Band cell/ neutrophil ratio), hemoglobin and peripheral blood smear for evidence of hemolysis was done if required.

All the data were analyzed by using SPSS version 20.

RESULTS

Out of total 2238 newborns admitted to NICU, 892(39.85%) newborns developed clinical jaundice.

Status of jaundice	Number	Percentage (%)
Jaundice present	892	39.85
Jaundice absent	1346	60.15
Total	**2238**	**100**

Table I: Prevalence of Neonatal Jaundice.

Gestational age	Preterm (<37 weeks)		Term (37-42 weeks)		Post term(>42 weeks)	
	N	%	N	%	N	%
Jaundice present	357	44.51	530	38.32	5	9.43
Jaundice absent	445	55.49	853	61.68	48	90.57
Total	**802**	**100**	**1383**	**100**	**53**	**100**

Table II: Prevalence of Neonatal jaundice according to gestational age.

Prevalence of jaundice was more in preterm than in term and post term newborns. 357 (44.51%) preterm babies had jaundice. (Table II) Among them, 640 neonates whose parents gave consent were studied to find the etiology. There were 489 neonates with pathological jaundice and 151 neonates with physiological jaundice. There were 411(64.21%) male and 229(35.79%) female neonates with jaundice. The male to female ratio was 1.79:1.

Gestational age	Number	Percentage (%)
Preterm(<37 weeks)	280	43.75
Term(37-42 weeks)	356	55.63
Post term(>42 weeks)	4	0.62
Total	**640**	**100.00**

Table III: Gestational age wise distribution of cases of neonatal jaundice.

Term babies were more (55.63%) in number than preterm in our study. (Table III).

Gestational age	Bilirubin range (mg/dl)	Bilirubin(mg/dl)	
		Mean	Std. Deviation
Preterm	9.42-30.54	16.78	3.58
Term	8.25-29.68	13.54	5.43
Post term	9.31-19.38	12.35	4.83

Table IV: Serum bilirubin level with gestational age.

The mean bilirubin level in preterm was 16.78 ±3.58 mg/dl and in term it was 13.54±5.43 mg/dl (Table IV).

Etiology	Number	Percentage (%)
Neonatal sepsis	285	44.52
Physiological jaundice	151	23.66
ABO incompatibility	78	12.18
Rh incompatibility	45	7.03
G6PD deficiency	20	3.12
Cephalhematoma	5	0.78
Sickle cell anemia	3	0.46
Breast milk jaundice	12	1.87
Infant of diabetic mother	11	1.71
Maternal use of oxytocin	10	1.71
polycythemia	10	1.56
Idiopathic	9	1.40
Total	**640**	**100.00**

Table V: Distribution of cases according to etiology.

The most common cause of neonatal jaundice was neonatal sepsis comprising of 285(44.52%) patients followed by physiological jaundice and ABO and Rh incompatibility. (Table V).

DISCUSSION

Neonatal jaundice is a major clinical condition worldwide occurring in up to 60% of term and 80% of preterm newborn in the first week of life. In most cases it is benign problem in neonates.

Out of total 2238 newborns admitted to NICU during the study period of one year, 892 newborns developed clinical jaundice showing the hospital based prevalence of neonatal jaundice in present study as 39.85 %. However the prevalence of neonatal jaundice in preterm was high (44.51%) as compared to term and post term neonates whose prevalence were 38.32 % and 9.43 % respectively. The prevalence of neonatal jaundice reported by various authors from India varies from 22% to 54.6%.[3, 6] In the present study prevalence of neonatal jaundice is 39.85%. This finding is almost in conformity with the finding of Bahl et al. and Bajpai et al. From India and Rasul et al. from Bangladesh.[3, 7, 8] However figure reported by Kaini et al in 2006 in B.P.Koirala Institute of health sciences (BPKIHS), Dharan,

Nepal shows the prevalence of neonatal jaundice to be 14% .[9] Out of 892 clinically jaundiced neonates, 640 neonates whose parents gave consent were included in the study to find out the etiology of jaundice.

Out of 640 jaundiced neonates male constituted 64.21 %(n=411) and female 35.79 % (n=229) with male to female ratio of 1.79:1 suggesting a male predominance in the study group. This could be because of predominance of males in total newborns admitted in the hospital during the study period (M: F ratio being 1.31:1) and males are given more preference than female for seeking health care facilities.Finding in the present study are in confirmatory to that of Rijal et al from Nepal Medical College Teaching Hospital, Kathmandu who have reported male predominance in their study (male =59.3% and female=40.7%).[10] Similar result was found by Deepeshwara et al. in 2009 in Kanti Children Hospital where male babies (72.6%) outnumbered female babies (37.4%).[11]

Out of 640 neonates, preterms were 43.75% (280), term were 55.63% (356) and post term were 0.62% (4) in our study. The mean total serum bilirubin level in term neonates was 13.54±5.43 mg/dl whereas 16.78±3.58 mg/dl and 12.35±4.83 mg/dl in preterm and post term neonates respectively in present study. The mean total serum bilirubin level in preterm neonates (16.78±3.58 mg/dl) were higher as compared to mean serum bilirubin level in term neonates (13.54±5.43) . A similar observation has been reported by Watchko et al in a study on preterm with hyperbilirubinemia.[12]

Out of 640 jaundiced neonates pathological jaundice was found in 74.94% neonates. This finding is similar to other study .[9] Out of different pathological causes observed in the study group, neonatal sepsis was the commonest and observed in 44.52% cases. . Similar findings were shown by other studies also[9,11] ABO incompatibility (mother O+ve, baby other than O) accounted for 12.18% cases of neonatal jaundice in our study. Kaini et al in 2006 and Kalakheti et al in 2009 in B.P.Koirala Institute of health sciences (BPKIHS), dharan reported the prevalence of ABO incompatibility to be 11.1% and 11.7% respectively and their observation are similar to present study. [9, 13]

Rh incompatibility (mother Rh-ve, baby Rh+ve) as a cause of neonatal jaundice was observed in 7.03% (n=45) cases in present study. Rasul et al. also reported a similar observation in a tertiary care hospital in Bangladesh where 5.4% cases had Rh incompatibility.[8] Similar result was also found in studies done in Nepal from Kanti children hospital where they reported the prevalence of Rh incompatibility to be 4.1% and by Chitlangia et al. from BPKIHS, Dharan where they reported Rh isoimmunization to be 6.7% .[11, 14]ABO incompatibility was approximately twice as common as Rh incompatibility in present study. The incidence of Rh incompatibility has decreased as a result of the introduction of Rh (D) immunoglobulin to Rh negative mothers. This could explain the decreased incidence of Rh incompatibility as compared to ABO incompatibility in present study.

G6PD deficiency and sickle cell anemia were present in 20(3.12%) and 3(0.46%) cases. Infant of diabetic mother and maternal use of oxytocin accounted for 1.71% each whereas breast milk jaundice and polycythemia caused jaundice in 1.87% and 1.56% cases respectively. In 9(1.40%) cases the causes could not be found out and labeled as idiopathic.

The prevalence of physiological jaundice in the present study was 23.66%. Rasul et al in a prospective cross-sectional study reported the prevalence of physiological jaundice to be 26.7%.[8] which is similar to our study.

LIMITATIONS

This study did not assess the risk factors associated with the etiologies of this condition. Identification of the risk factors may help to reduce the complications of this condition. It also did not assess long term outcome of the patients.

CONCLUSION

Out of 2238 newborns admitted to NICU, 892 newborns developed jaundice. Out of these, 640 jaundiced neonates were included in the study .The prevalence of neonatal jaundice in present study was 39.85% with male to female ratio 1.79:1. Prevalence of neonatal jaundice in preterm, term and post term was 44.51%, 38.32% and 9.43% respectively. Among the various etiologies of neonatal jaundice, neonatal sepsis (44.52%) was found to be the most common cause which is followed by physiological jaundice (23.66%) and ABO incompatibility (12.18%). The mean serum billirubin level in the present study was 16.78±3.58 mg/dl in preterm, 13.54±5.43 mg/dl and 12.35±4.83 mg/dl in term and post term neonates respectively.

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ORIGINAL ARTICLE

A Comparative Study of Percutaneous Nephrolithotripsy and Extracoeporeal Shockwave Lithotripsy For The Treatment of Lower Pole Kidney Stone of Size 10-20 mm

NM Shrestha

ABSTRACT

Introduction: A renal stone is commonly found at the Lower-pole of the kidney. Studies have reported various opinions about efficacy and safety of Percutaneous Nephrolithotripsy and Extracoeporeal Shockwave Lithotripsy for the treatment of lower pole stone of size 10-20 mm. **Aims**: The present study aimed to compare between Percutaneous Nephrolithotripsy and Extracoeporeal Shockwave Lithotripsy for safe and effective treatment of lower pole stone of size 10-20 mm. **Method**s: It is a prospective study conducted from December 2019 to November 2020 in the Urology Department of Nepalgunj Medical College. Total 66 patients under inclusion criteria were divided into two groups. Group I (32 patients) was allocated for patients who were treated under Percutaneous Nephrolithotripsy while Group II (34 patients) was allocated for patients who were treated with Extracoeporeal Shockwave Lithotripsy. Two groups were compared for stone free rate, retreatment rate, auxiliary treatment (%), operation time, hospital stay, haematuria, blood transfusion, obstruction and fever. **Results**: The stone free rate was significantly higher in Group I when compared to Group II. While the rate of retreatment and auxiliary treatment were significantly lower in Group I than Group II. However, mean hospital stay, mean operation time and the rate of haematuria was significantly higher in Group I when compared to group II. There were no statistically significant differences between Group I and Group II for post-operative complications such as, blood transfusion, obstruction and fever. **Conclusion:** Stone free rate was significantly higher in Group I while retreatment rate and auxiliary treatment rate were significantly higher in Group II. Therefore, Percutaneous Nephrolithotripsy is more effective for the treatment of the lower pole stone of size 10-20mm when compared to Extracoeporeal Shockwave Lithotripsy. However, duration of hospital stay and operation time were longer and incidence of haematuria was higher in Percutaneous Nephrolithotripsy than Extracoeporeal Shockwave Lithotripsy.

***Keywords**: ESWL, Kidney stone, Lower pole stone, PCNL*

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INTRODUCTION

Nephrolithiasis is a worldwide problem with an annual prevalence rate of 3-5%[1-4]. Renal stone are commonly found at the Lower-pole of the kidney with incidence of 44%. Renal stones of size 10-20 mm are found at lower calyx with incidence of 23 %. [5,6] Management of kidney stones can be done from minimally invasive endourological approaches, including shock wave lithotripsy (ESWL) and percutaneous nephrolithotomy (PCNL).[7-9] European Association of Urology recommends that preferable treatment of LPS stone of size 10-20 mm the first choice is ESWL or RIRS and second choice is PCNL.[10] However according to American Urology Association, for the lower pole stone of size 10-20 mm PCNL is recommended.[10] These expert opinions panel of urology have clearly mentioned that PCNL is the first choice for the stone greater than 20 mm but the recommendation between PCNL and ESWL with respect to the stone size 10 mmm to 20 mm are found to be different among these experts. Similarly, different studies have shown various opinions about efficacy of PCNL and ESWL.[11-17] The optimal management of lower calyceal stone is still in debate, controversial conclusions are reported which causes dilemma for urologist to choose the best techniques for treatment of lower pole kidney stone. The therapy of nephrolithiasis should achieve maximum stone clearance with minimum morbidity. Therefore we aim to confirm the best options for safe and effective treatment of lower pole stone of size 10-20 m following PCNL and ESWL procedures in Nepalgunj Medical college, Department of Urology, Kohalpur.

METHODS

It is a prospective hospital based study. Data of patients who underwent PCNL and ESWL were collected from Nepalgunj Medical College, Department of Urology from December 2019 to November 2020. Information about patients regarding stone free rate, retreatment rate, auxiliary treatment rate, operation time (minutes), hospital stay(days) and rate of post-operative complications such as haematuria, blood transfusion, obstruction, fever were collected. Approval of institutional review committee was obtained.

Preoperative evaluation

Inclusion criteria: Patient with a single lower pole renal stone of size 10-20 mm in diameter, age greater than 18 years, male or female were included in this study.

Exclusion criteria: Patient with uncorrected coagulopathy, active untreated UTI, pregnancy, gross obesity (>120 kg; due to technical difficulty in placing the patient in focus) bilateral stone and multiple stone were excluded in the study. Before enrolment a written formal informed consent was taken from all the patients meeting inclusion criteria. Patient were let to understand the procedure, benefit and risk of both PCNL and ESWL. Patients who fulfilled the inclusion criteria were randomly selected according to lottery system to form 2 groups. Group I was allocated to patients who were treated with PCNL procedure while Group II was allocated for patients who were treated with ESWL procedure. Sample size in each group was determined.[18] Group I consisted 32 patients and Group II consisted 34 patients.

Operative techniques

Extracoeporeal Shockwave Lithotripsy: Extracoeporeal Shockwave Lithotripsy (ESWL) was performed under intramuscular administration of 1 ml pethidine (50 mg/ml) and 1ml promethazine (25mg/ml). After 30-45 minutes the procedure was started. Under C-arm X-ray control, stone was localized and fragmented by applying 3000 shock wave frequency with 80 KW energy. When patients felt free from drowsiness they were discharged from hospital.[19]

Percutaneous Nephrolithotomy: Percutaneous Nephrolithotomy (PCNL) was performed under spinal anaesthesia. At first ureteric catheter was placed in lithotomy position. Then position of patient was changed to prone. Retrograde pyelogram was performed by injecting contrast 76% urograffin through ureteric catheter to opacify the pelvicalyeceal system of kidney. Then lower cylax was punctured. Tract was gradually dilated. Stone was visualized by using standard nephoscope 26 fr. Stone got fragmented by using pneumatic lithotriptor energy source. At the end of procedure, D. J. stent was placed.[19]

The primary end point of this study was stone free rate and retreatment rate. Stone free rate is defined as complete clearance of stones or presence of residual fragments of stone of size less than 4mm.[20] Stone free rate was established during follow-up of patients. For PCNL group patients were being followed up in one month from the day of procedure while for ESWL group patients are being followed in every months from the day of procedure till 3 months. Retreatment was applied after follow-up if no or inadequate fragmentation of the stone was occurred. No fragmentation or residual fragments of stone greater than 4mm in PCNL group after one month of PCNL and in ESWL group after three months of ESWL was considered as a failure.[9,17,20]

The secondary end point of this study were operation time, length of hospitalization, auxiliary procedure rate and post-operative complications rate. These indicators were compared between PCNL and ESWL groups. Operation time was defined as a duration (in minutes) which was taken for actual procedure to remove lower pole renal stone. Hospital stay (in hours) was defined as the period which was started from the first postoperative day to the day that patients were discharged from hospital. Auxiliary procedure for ESWL group was defined as the addition at procedures such as URSL or PCNL if carried on in ESWL group to remove stone. Auxiliary procedure for PCNL group is defined as the addition procedure such as URSL if carried on in PCNL group to remove stone. Post-operative complications were considered as the occurrence of haematuria, blood transfusion, fever and obstructions in ESWL and PCNL group.

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 and stone size were expressed as mean ± standard deviation (SD) whereas the qualitative variables such as stone free rate, sex, retreatment, auxiliary treatments and post-operative complications were presented as frequency and percentage. For analysis of quantitative variables, Independent sample t-test or Mann-Whitney U test was used and for qualitative variable chi-square test was used[21]. A p-value less than 0.05 was considered statistically significant.

RESULTS

Baseline characteristics of two categorized groups of patients with respect to sex, age and average stone size were compared and found to be statistically nonsignificant (p>0.05).

Variables	Group I	Group II	p-value
Sex (male: female)	62.5:37.5	64.7:35.3	0.998
Age (years)	48.22+10.31	46.61+10.61	0.388
Stone (mm)	15.28+2.44	15.03 +2.24	0.688

Table I: Baseline characteristics of the patients in Group I (PCNL) and Group II (ESWL).

Variables	Group I Frequency (%)	Group II Frequency (%)	p-value
Stone free	30 (93.75)	23 (67.65)	0.012*
Retreatment	2 (6.25	18 (52.94)	0.001*
Auxiliary treatment	0	11 (32.35)	0.000*
Haematuria	5 (15.62)	0	0.023*
Blood transfusion	2 (6.3)	0	0.231
Obstruction	0	3 (8.82)	0.240
Fever	3 (9.37)	0	0.108

***= statistically significant.**

Table II: Comparison of the rate of stone free, retreatment, auxiliary treatment, haematuria, blood transfusion, obstruction and fever between Group I (PCNL) and Group II (ESWL).

Variables	Group I (Mean+SD)	Group II (Mean+SD)	p- value
Operation time (min)	59.00+3.86	46.35+2.07	0.03*
Hospital stay (hours)	96.19+13.54	1.55+0.49	0.00*

Table III: Comparison of mean operation time and hospital stay between Group I (PCNL) and Group II (ESWL).

The stone free rate was significantly higher in PCNL group when compared to ESWL group. While the rate of retreatment and auxiliary treatment were significantly lower in PCNL group than ESWL group. However, mean hospital stay, mean operation time and the rate of haematuria was significantly higher in PCNL group when compared to ESWL group. There were no statistically significant differences between the PCNL and ESWL groups for post-operative complications such as, blood transfusion, obstruction and fever (Table II and III)

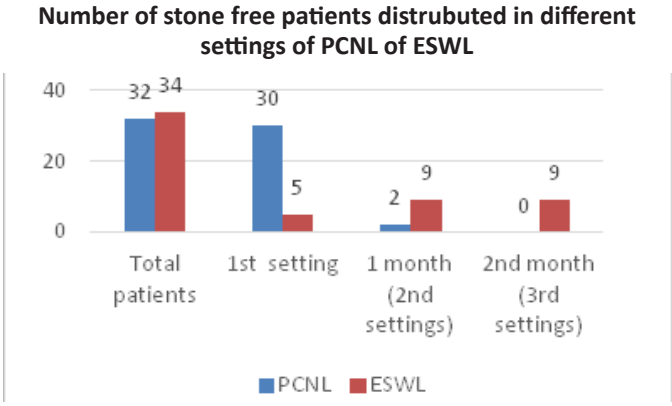

Figure 1: Number of stone free patients in three different settings.

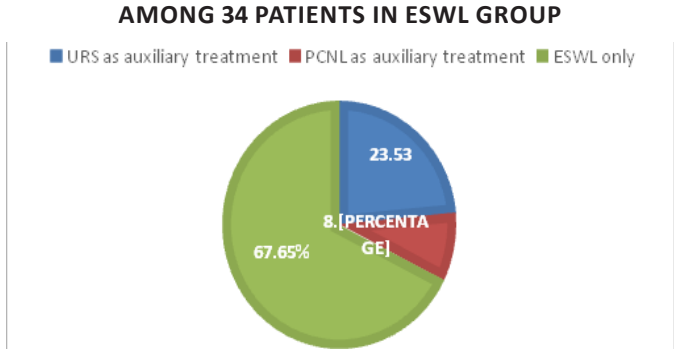

Figure 2: Auxiliary treatment in ESWL group..

Figure 1 shows that out of 32 patients in PCNL group 30 patients were stone free in 1st setting of PCNL and remaining 2 patients were retreated with PCNL and found to be stone free in 2nd setting of PCNL. Hence no need of auxiliary treatment in PCNL group. Out of 34 patients in ESWL group 5 patients and 9 patients each were stone free in 1st setting, 2nd setting and 3rd settings, respectively and remaining 11 patients had to be treated with auxiliary treatment as shown in figure 3.For complete treatment of lower pole stone of size 10-20 mm in ESWL group,8 patients and 3 patients were further treated with URS and PCNL, respectively as an auxiliary treatment.

DISCUSSION

The management of lower pole stone of size 10-20mm is still in debate.This study aim to confirm the best procedure for safe and effective treatment lower pole stone of size 10-20 m following PCNL and ESWL procedures.For which the variables compared between two independent groups were stone free rate and retreatment rate as primary out come and mean operation time, auxiliary treatment rate, mean hospital stay, post-operative complications rate (haematuria, blood transfusion, obstruction, fever) as secondary outcome.The present study showed that stone free rate was 93.75% of 32 patients in PCNL group and just 67.65% of 34 patients in ESWL group. The rate was significantly higher in PCNL group when compared to ESWL group. This findings has been supported by the study of Montadhar H et al[22], Elspeth M et al[23], Kallidonis P[24], Bozzin G et al[25], Tayfun S et.al[7] and Albala DM[26] Based on the above reviews and our result it is revealed that the success rate of PCNL is 84.2 % to 95% while success rate of ESWL is varied form 27% to 67.65%. Meanwhile, study of Gurocak S et al[27] showed that lower pole stone treatment by ESWL has shown a large variation for stone free rate from 25% to 85%. Another advantages of PCNL procedure were found to have lower retreatment rate (6.25%) and auxiliary treatment rate (0%) than ESWL procedures in which retreatment rate and auxiliary treatment rate were 52.94% and 32.35%, respectively. Therefore for complete removal of lower pole stone following the PCNL only 6.25 % of 32 patients needed second setting of PCNL and none of the patients needed the auxiliary treatment while following the ESWL patient needed second

and third settings of ESWL treatment. Meanwhile even after 3rd setting of ESWL 11 patients were not successfully treated to remove lower pole stone. Therefore, 8 patients and 3 patients in the ESWL group were further treated with URS and PCNL,respectively. Likewise our observation, studies of James FD[5],Albala DM et al[26], Chaussy C[17] and Panogiotis K[24] mentioned that PCNL was more effective than ESWL for the treatment of lower pole stone of size 10-20 m and ESWL was less effective for removal of stone size greater than 10mm. Similarly, the study Kallidonis P[24], Bozzin G et al[25], Albala D et.al[26] and Sheng Han Tsai [9] have also shown that retreatment rate was higher in ESWL group when compared with PCNL. Likewise, the study of Bozzin et.al. 2017 [25] also revealed that auxiliary treatment rate was higher in ESWL than PCNL. Therefore, on the basis of the result obtained in the present study and previous studies on stone free rate, retreatment rate and auxiliary treatment PCNL is more effective for the treatment of lower pole stone of size 10-20 mm. Mean hospital stay was significantly higher in PCNL group than ESWL group. This finding of the present study is supported by study of Montadhar H et.al[22], Elspeth M et al[23], Lingeman JE[28] and Panogiotis. [24] Furthermore, mean operation time were significantly higher in PCNL group than ESWL group which is also supported by the study of Kallidonis P [24] and Montadhar H et al.[22] The present study showed that the rate of haematuria in PCNL group was significantly higher than ESWL group however in the study of Montadhar H et al [22] and Sheng HanTsai[9] the difference were not significant for rate of haematuria. There were no statistically significant differences between the PCNL and ESWL groups for other post-operative complications such as, blood transfusion, obstruction and fever. Furthermore, these findings of this study has been supported by the study of Lingeman JE et al[28], Rosette JD [29], Dangol UMS.[30]

LIMITATIONS

This study had just considered the size of stone, however, composition of stone was not analyzed. Therefore, if the stone was of cystine or hard dense type this might had biased our result with respect to stone free rate, operation time and retreatment rate.

CONCLUSION

This study revealed that stone free rate was significantly higher in PCNL while retreatment rate and auxiliary treatment rate were significantly higher in ESWL. However, duration of hospital stay and operation time were longer and incidence of haematuria was higher in PCNL than ESWL. Therefore for effective treatment of lower pole stone of size 10mm to 20mm, PCNL can be recommended as a first choice by taking safety measures for its major complication of haematuria.

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ORIGINAL ARTICLE

Role of Alanine Aminotransferase in Determining the Biliary Etiology in Acute Pancreatitis

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ABSTRACT

Introduction: Acute pancreatitis a disorder that has numerous causes and an obscure pathogenesis. It can be a serious abdominal emergency associated with significant morbidity and mortality. Cholelithiasis is most common cause of acute pancreatitis and excessive alcohol consumption is second most frequent cause which together account for approximately 80% of underlying etiology. The detection of biliary etiology is crucial to delivery of definitive therapy to prevent repeated attacks of acute pancreatitis. During an attack of acute pancreatitis, elevation of alanine aminotransferase to >150 IU/L is a predictive factor for biliary cause of acute pancreatitis. **Aims:** To investigate the predictive value of raised alanine aminotransferase in determining biliary etiology in patients presenting with acute pancreatitis. **Methods:** A prospective study was done among 70 patients who were admitted in surgery department over a period of one year with diagnosis of acute pancreatitis. Peak alanine aminotransferase within 48 hours of presentation was recorded. The diagnosis was based on typical clinical presentation of acute pancreatitis combined with an increase in serum amylase levels ≥ 3 times the upper limit of the laboratory reference value. All biliary cases were confirmed by abdominal ultrasonography. **Results:** The mean age of the patients was 47.9 ±15.7 years (19-88 years). Acute pancreatitis was common in 31-40 years of age group. Among them, 40(57.1%) were male and 30(42.9%) were female. Forty two (60%) patients had biliary pancreatitis, 20(28.5%) had alcoholic pancreatitis, 2(2.8%) patients had drug induced pancreatitis and 6(8.5%) patients had idiopathic pancreatitis. Mean alanine aminotransferase for biliary pancreatitis was 205.9U/L, while cases with other etiologies (alcoholic 58.4U/L; drug induced 62.6 U/L; and idiopathic 48.3 U/L) showed significantly lower values (p=0.001). **Conclusion**: An elevated alanine aminotransferase strongly supports a diagnosis of gallstones in acute pancreatitis.

Keywords: Acute pancreatitis, Alanine aminotransferase, Biliary pancreatitis

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INTRODUCTION

Acute pancreatitis (AP) is a common surgical disorder that has numerous causes and an obscure pathogenesis. Gallstones and excessive alcohol consumption are the most frequent causes of AP and together account for approximately 80% of underlying aetiology.[1] Up to 60% of all presentations of AP are secondary to gallstones.[2] Other aetiologies are diverse and include pancreatic divisum, malignancy, endoscopic retrograde cholangiopancreatography (ERCP), hypercalcaemia, drug use and infection.[3] Acute Pancreatitis (AP) is an acute inflammatory process of pancreas that frequently affects the peripancreatic tissue and less frequently the systemic organs. The clinical severity of AP ranges from mild to severe, with an overall mortality of about 10%.[4] Identification of biliary cause of pancreatitis is important to provide definite management in form of cholecystectomy to prevent further attacks.[5,6] Several biochemical investigations have been proposed to identify a biliary etiology, including bilirubin, alanine aminotransferase (ALT), alkaline phosphatase and aspartate transaminase. An elevated ALT is widely considered the most useful of these markers. During an attack of acute pancreatitis, the elevation of alanine aminotransferase to >150 IU/L is a predictive factor for biliary cause of acute pancreatitis. A previous meta-analysis has indicated that this threefold elevation in alanine aminotransferase has a positive predictive value of 95% in diagnosing acute gallstone pancreatitis.[7]

METHODS

A prospective study was done among 70 patients of acute pancreatitis, who were admitted in surgery department of

Nepalgunj Medical College, over a period of one year (July 2018 to June 2019). Peak ALT within 48 hours of presentation was recorded. The diagnosis was based on the typical clinical presentation of AP combined with an increase in serum amylase levels ≥ 3 times the upper limit of the laboratory reference value. Gallstone pancreatitis was confirmed by the presence of gallstones on ultrasonography. The Abdominal ultrasound (AUS) was performed in the emergency room and later, after ward admission. The diagnosis of AP as defined by revised Atlanta classification was taken into consideration.

All patients admitted with acute pancreatitis with elevated serum amylase level ≥3 times normal were included and conditions associated with increased alanine aminotransferase other than acute pancreatitis were excluded. The data were analyzed using Statistical Package for Social Sciences Programme v.21. Sensitivity, specificity and positive and negative predictive value of ALT was determined in relation to etiology of acute pancreatitis. When the variables were found to be approximately normally distributed, parametric testing was used to compare mean values between the causes of AP, using analysis of variance (ANOVA) test.

RESULTS

The mean age of the patients was 47.9 ±15.7 years (19-88 years). AP was common in 31-40 years of age group. Among them, 40(57.1%) were male and 30(42.9%) were female. Forty two (60%) patients had biliary pancreatitis and rest of the patients had other causes **(Table I)**. Among females, most (80%) had biliary etiology while among males 45% had biliary and 40% alcoholic etiology. Serum amylase and ALT levels were significantly greater in patients with biliary pancreatitis than in the other non-idiopathic subgroups. Mean ALT for biliary pancreatitis was 205.9U/L, while for alcoholic, drug induced and idiopathic, the values were 58.4U/L, 62.6U/L, and 48.3U/L, respectively. Comparing between the groups showed ALT raise to be significant in biliary pancreatitis (p = 0.001).

The mean ALT for male and female showed significant difference **(Table II)**. The mean ALT for patients older than 40 years was 146.2 U/L while it was 144.8 U/L in younger patients. It was highest in the age group 30-40 yrs.

The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of alanine aminotransferase with cut off of 100 U/L for biliary pancreatitis was 67%, 94%, 93% and 73.8% respectively. Correlation between alanine aminotransferase and etiology of AP was statistically significant.

Etiology	Mean ALT(U/L)	Std. Deviation	n (%)	p-value
Gallstones	205.9	100.2	42 (60%)	0.001
Alcohol	58.4	30.5	20 (28.5%)	
Drugs	62.6	10.6	2 (2.8%)	
Idiopathic	48.3	16.3	6 (8.5%)	

Table I: Comparing mean ALT in different etiology of pancreatitis.

Sex	Mean ALT(U/L)	Std. Deviation	n	P value
Female	176.8	112.3	30	0.033
Male	122.1	97	40	

Table II: Comparing mean ALT with Sex.

Age group (years)	Mean ALT(U/L)	Std.Deviation	n	P value
19-30	148.9	107.14	9	
31-40	143.0	111.36	21	
41-50	156.1	88.43	12	
51-60	132.9	114.4	12	0.99
61-70	148.9	131.7	9	
70-80	142.3	86.92	5	
80-90	163.8	203.36	2	
<40	144.8	108.2	30	0.95
>40	146.2	106.7	40	

Table III: Comparing mean ALT with different age groups.

SENSITIVITY	67%
SPECIFICITY	94%
PPV	93%
NPV	73.8%

Table IV: Comparison of Sensitivity, Specificity, PPV and NPV of ALT in our study for predicting Biliary Pancreatitis.

DISCUSSION

Worldwide gallstones and alcohol are the most common etiologies of pancreatitis. These account for almost 80% of the cases of acute pancreatitis. Baker, et.al, Baing, et.al, Nawaz, et.al showed that incidence of non-biliary pancreatitis is more common in their institute, whereas, Lakhey, et.al. and Joshi, et.al showed a higher incidence of biliary pancreatitis.[8,9,10,11]In our study, incidence of biliary pancreatitis is higher than that of non -biliary pancreatitis. The exact cause of this geographical variation is not well known, but growing evidence suggests that environmental and possibly genetic cofactors may also play a role in the development of AP. The current study demonstrates that a raised ALT within 48 hr of presentation to hospital is strongly predictive of a biliary origin in AP. This finding is supported by a number of previous studies which found that the predictive value of ALT is even greater than that demonstrated

by this study. In the present cohort of patients, an ALT of >100 units/L had a PPV for gallstones of 93%, compared with a 1994 meta-analysis which found a PPV of 95% for the ALT level of 150 U/L.[12]More recent studies have found that ALT levels that are three times the normal level or >150 units/L have PPVs for gallstones of 92–93%.[13,14]Another study found that an ALT of > 60 units/L had a PPV for gallstones in AP of 78.8%.[15] Although AUS carries no risk and is inexpensive and readily available, it risks the possibility that a negative result will be interpreted as a reason not to perform cholecystectomy, although 21–80% of these patients will have a biliary etiology depending on the level of ALT. This risk is further underlined by data indicating that untreated biliary AP (BAP) has been associated with recurrent attacks in 13% of patients within 1 month of hospital discharge and in 17% at a median of 18 weeks after the initial episode.[16,17] In addition, recurrent admissions for this tend to increase in length and are associated with greater morbidity.[17,18] Thus, omitting cholecystectomy in the presence of occult biliary disease can be associated with significant morbidity, whereas early intervention with laparoscopic cholecystectomy is safe and effectively reduces recurrence rates.[19]

It is probable that this current study significantly under-diagnoses the incidence of gallstones in AP. Firstly, routine access to endoscopic ultrasound (EUS) is not possible. Several studies have shown that EUS has a greater sensitivity and specificity for BAP than AUS and reduces the number of patients diagnosed with idiopathic disease. In the current study, 14% of patients were of unknown etiology, compared with 7–11% in studies using EUS. One of these studies found that EUS diagnosed cholecystolithiasis or choledocholithiasis in 15% of patients with a negative AUS and CT.[2,13,14,20] It was difficult to assess the predictive value of AUS in the current study as the investigation represents part of the reference standard such that the result of the AUS influences the final diagnosis and decision for further investigations. The second reason for an underestimation of the true prevalence of biliary pancreatitis is that a negative initial AUS may have falsely reassured the investigating clinician and the patient may not have been followed up with further investigations. Although magnetic resonance cholangiopancreatography (MRCP) has been shown to have similar accuracy to ERCP in diagnosing BAP.[21,22] This investigation is not employed routinely in patients with a negative AUS and resolving AP because of its limited availability. An underestimation of the true prevalence of BAP may explain why the PPV for ALT produced in this study is lower than that reported in other similar papers. If a number of the patients with a raised ALT were misdiagnosed as having non-biliary etiology, the sensitivity and PPV of the test would be underestimated.

In addition, ALT within the normal range reduces the likelihood of gallstones in AP to 25%. The results of a recent review article indicate that the likelihood ratio (LR) for BAP associated with a negative AUS is 0.14–0.35.[2] Using the combination of these two factors in the clinical setting would therefore reduce the need for unnecessary cholecystectomy, thus reducing surgical workloads and hospital waiting lists, as well as enabling a more rapid investigation into alternative causes for the presenting pancreatitis.

LIMITATIONS

There are few limitations to this study. The sample size is small. Abdominal ultrasound is highly specific, but has poor sensitivity for BAP and so is limited in its ability to completely exclude this diagnosis.

CONCLUSION

Alanine aminotransferase is a useful marker for predicting gallstones in acute pancreatitis. In addition, a combination of positive abdominal ultrasound and elevated alanine aminotransferase may be utilized to diagnose biliary pancreatitis with much accuracy.

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ORIGINAL ARTICLE

Ischemic Stroke and its Association with Risk Factors at Nepalgunj Medical College Teaching Hospital Kohalpur

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ABSTRACT

Introduction: Incidence of stroke increases with age and growing elderly population worldwide, the number of patients with stroke are likely to increase. It is the third most common cause of death in world in that 85% are ischemic in nature. Atherosclerosis is a major risk factor in cerebrovascular diseases. Carotid Intima Media thickness (CIMT) is a surrogate marker of atherosclerosis and provides a non-invasive method for the risk assessment of cerebrovascular diseases. **Aims**: To study the atherosclerotic risk profile of patients admitted with ischemic stroke in medical ward with study of the carotid artery intima-media thickness in patients with acute ischemic stroke. **Methods:** 92 patients with ischemic strokes were studied in this observational study. Carotid Doppler was performed in all patients with emphasis on carotid artery stenosis and intima thickening. Analysis of Association of various risk factors was done in detail. Study period was from June 2019 to May 2020. **Results:** Higher degree of stenosis was associated with hypoechoic plaques and cortical strokes. Hypertension was the most common and most significant risk factor. Multiple risk factors also appear to have synergistic actions **Conclusion:** Various modifiable risk factors provide valuable target for primary and secondary prevention of stroke. Carotid Doppler is a very cheap and highly effective tool for further management of stroke patients. Most of the asymptomatic patients, risk factors may warrant precautionary carotid Doppler, and may result in significant reduction in disease burden on the families and the community and should be encouraged.

Keywords: Carotid Doppler, Carotid Intima Media Thickening, Ischemic Stroke

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INTRODUCTION

Stroke, both ischemic and hemorrhagic, is a common and devastating disorder. Currently, ischemic heart disease and stroke are the leading causes of mortality worldwide and more than 80% of deaths occurring in the low and the middle income countries.[1] The incidence of stroke increases with increasing age and with the growing elderly population worldwide, the number of patients with stroke are likely to increase.[2] The early stage of atherosclerosis is vessel injury induced by multiple conditions that directly or indirectly injure the vessels. Hypertension is the most common cause of vessel injury.[3] In most of the ischemic strokes the underlying pathophysiology is atherosclerosis. The modifiable risk factors are mostly related to the atherosclerotic burden and include diabetes, hypertension, smoking, and hyperlipidemia.[4] Among Several risk prediction scoring systems the carotid intima-media thickness is a reliable independent marker of cardiovascular disease.[5] In India, studies have reported prevalence of metabolic syndrome ranging from 24.9% in northern India to 41% in Southern India using different definitions.[6] CIMT is a strong predictor of future cardiovascular morbidity and mortality, in particular myocardial infarction and stroke.[7] CIMT has been reported to correlate with myocardial infarction, stroke, and peripheral artery disease.[8] Carotid Intima Media thickness is a surrogate marker of atherosclerosis.[9] IMT is a powerful predictor of coronary and cerebrovascular complications (risk ratio from

2 to 6) with a higher predictive value when IMT is measured at multiple extra cranial carotid sites than solely in the distal common carotid artery.[10] Measurement of carotid IMT could influence a clinician to intervene with primary prevention and medication early.[11]

METHODS

This is a single site observational study. We enrolled 92 patients with clinical history of cerebrovascular stroke confirmed with CT head from patients who were admitted in medical ward in Nepalgunj Medical College Teaching Hospital, Kohalpur, from June 2019 to May 2020. All the patients were informed about the design of the study, and informed consent was taken. All patients with acute ischemic stroke in the age group of 30-70 years attending General Medicine OPD and inpatients admitted to Nepalgunj Medical College Teaching Hospital were included in this study. Patients with hemorrhagic stroke, ischemic stroke < 30 years of age, past history of CVA, valvular heart disease, on oral anti coagulants, past history of bleeding disorders were excluded. Each patients enrolled in the study were asked in details history regarding the present complaints, past history, addiction history including smoking and drug history. Thorough general examination followed by detailed and complete neurological has been performed, including examination carotid pulsation, peripheral nerve, and vessels. All routine blood investigations, including lipid profile, electrocardiogram and two-dimensional D echo, were done in all patient. CIMT thickness was done by a trained professional using a high resolution B mode ultrasonography system having an electrical linear transducer mid frequency of 7.5 MHz Scans were performed on both right and left extracranial carotid arteries. The IMT was measured as the distance from the leading edge of the first echogenic line to the second echogenic line. The first echogenic line represents the luminal intimal interface and the second line is produced by collagen containing upper layer of intimal adventitia. At each longitudinal projection determination of IMTs were conducted at the side of greatest thickness and at two points 1 cm upstream and 1 cm downstream from the side of greatest thickness as described. The mean of six IMT measurement from both sides were used as the representative value.

Statistical Analysis: Statistical analysis was performed using the software package SPSS for Windows 20.0. Data analysis was performed, and chi-square test was used to show the significance relation between various risk factors and carotid intima-media thickening/stenosis as required and possible. $P < 0.05$ was considered to be statistically significant and $P < 0.001$ was considered to be statistically highly significant.

RESULTS

Age	Male	Female	Total
<30	0	8	8
31-40	4	0	4
41-50	20	8	28
51-60	22	6	28
61-70	20	4	24
TOTAL	**66**	**26**	**92**

Table I: Age distribution.

Risk Factor	Number of Patients
Hypertension	64
Diabetes Mellitus	24
Smoking	56
Dyslipidemia	56
Previous stroke	24

Table II: Modifiable Risk Factor.

Plaque Morphology	Percent of Stenosis			
	>70%	50-70	<50%	Total
Hypoechoic	10	10	40	60
Hyperechoic	4	4	24	32
Total	**14**	**14**	**64**	**92**

Table III: Plaque Morphology and Percent of Stenosis.

CIMT	Hypertension	
	Present	Absent
Present	60	14
Absent	4	14

Table IV: Pattern of Infarct and Percent of Stenosis.

Pattern	Stenosis <40%	Stenosis >40%	Total
Subcortical	52	6	58
Cortical	2	32	34
Total	**54**	**38**	**92**

Table V: Carotid Intima media Thickness (CIMT) and Hypertension.

Smoking	CIMT	
	Present	Absent
Present	51	5
Absent	20	16

Table VI: CIMT and Smoking.

Dyslipidemia	CIMT	
	Present	Absent
Present	50	6
Absent	20	16

Table VII: CIMT and Dyslipidemia.

In our study most common age group suffering from stroke was 41-60 years and male predominance was seen as in table I. Among the various modifiable risk factors, hypertension had

the most striking association with stroke in our study. (69.56%) hypertension was closely followed by smoking and dyslipidemia (61%) as shown in table II. Diabetes and previous history of stroke were present in 24 patients each (26%). Important to note that significant stenosis above >40% increased with the number of risk factors as shown in table V, VI and VII. In the 34 patients who had cortical strokes, 32 (95%) had stenosis >40%. Out of 64 patients were found to have hypertension, CIMT was present in 60(93.75%) patients as shown in table v ($P < 0.02$). 51 out of 56 smokers, and 50 out of 56 patients with dyslipidemia had CIMT as well shown in table VI and VII ($P < 0.05$). In the present study, out of 92 patients of ischemic stroke, 66 (62%) patients were treated with medical management whereas 26 (28%) patients who had major stenosis (>50%) within carotid arterial system required carotid intervention. Age is the strongest determinant of stroke, which is more than 40 years.

DISCUSSION

In our study most common age group suffering from stroke was 41-60 years with male predominance (Table I). In the study 63.3% are male patients and 36.7% are female patients and mean age in our study was 58.7 similar to which was in study done by ratnakar sahoo[12] in JIPMER Pondicherry, India were mean age was 60.2 and also in study of pruissen et al the mean age of the patient population was 63 years.[13] In our study among the various modifiable risk factors, hypertension had the most striking association with stroke. 69% hypertension was closely followed by smoking and dyslipidemia 61% each. The number of plaques was higher among patients with diabetes (33.67%), hypertension (70%), and smoking (40%) in a study done by Dutta et al.[14] In this study Important to note that significant stenosis above >40% increased with the number of risk factors table II. In the 38 patients with >40% stenosis, as many as 32 patients had three risk factors or more as shown in table IV. Important to note that significant stenosis above >40% increased with the number of risk factors which was similar to the study done by Patel et.al in which 34 patients who had cortical strokes, 32 (95%) had stenosis >40%.[15] In our study out of 64 patients were found to have hypertension, CIMT was present in 60(94%) as shown in table V ($P < 0.02$). 51 out of 56 smokers, and 50 out of 56 patients with dyslipidemia had CIMT also as shown in table VI and table VII ($P < 0.05$). In the study stroke with hypertension the mean CIMT was 0.75mm and stroke with both hypertension and diabetes mellitus the mean CIMT was 0.85mm which was similar to mean CIMT 0.89 ± 3 in subjects with hypertension along with carotid lesions,90% in hypertensive patients.[16]

LIMITATION

Small sample size to give the exact inference of the problem in the community.

CONCLUSION

We conclude that various risk factors for ischemic stroke may be very important target for prevention of stroke. They not only have extremely strong association with Ischemic stroke but also have synergistic actions. Moreover, they have strong association with the carotid intimal thickening, a factor that dictates the surgical management of Ischemic stroke.

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Correlation between Reflux Symptom Index and Reflux Finding Score in Laryngopharyngeal Reflux

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ABSTRACT

Introduction: Laryngopharyngeal reflux is an extra esophageal variant of gastro esophageal reflux disease and is characterized by change in voice, recurrent throat clearing, chronic cough, discomfort in throat, globus. The larynx and pharynx are devoid of the normal acid clearance mechanism even three episodes of reflux per week seems to be associated with a significant disease. **Aim**: The aim of the study was to evaluate the correlation between the reflux symptom index and reflux finding score in patients with Laryngopharyngeal reflux. **Methods**: This prospective analytical study was conducted from November 2019 to October 2020 in total of 65 patients presented in department of Otorhinolaryngology, Nepalgunj Medcial College and Teaching Hospital, Nepalgunj. Reflux symptom index questionnaire with nine Questions were answered by patients on a 5 point scale. Reflux symptom index of more than 13 out of total score of 45 was considered to indicate Laryngopharyngeal reflux were as, reflux finding score was based on laryngoscopic findings after evaluating 8 items. Score more than 7 out of 26 was taken as an indicator for presence of Laryngopharyngeal reflux. **Results**: The reflux symptom index was more than 13 on 22 patients withmean11.85±3.48 and reflux finding score was more than 7 on 11 patients with mean 5.02±3.23 with statistically moderate correlation between reflux symptom index and reflux finding score (p=0.000,r=0.595).**Conclusion**: There is moderate correlation between the reflux symptom index and reflux finding score. The combined use of these questionnaires and laryngoscopic findings can be more precise, practical and cost effective in the diagnosis of laryngopharyngeal reflux.

***Keywords*:** Correlation, Laryngopharyngeal reflux (LPR), Reflux finding score (RFS)**,** Reflux Symptom Index (RSI)

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INTRODUCTION

Laryngopharyngeal reflux (LPR) is a retrograde flow of gastric contents into laryngopharynx causing damage to laryngeal tissue. Laryngopharyngeal mucosa do not possess protective mechanism against acidopeptic activities of stomach contents, which leads to damage.[1]In 1996 Koufman proposed LPR to designate its symptoms, signs and its effects on laryngeal tissue.[2]The two theories have been proposed for pathophysiology of LPR. The micro aspiration theory proposed, laryngeal injury occurs due to acid, pepsin, bile and trypsin. Second proposed explanation is esophageal bronchial reflex theory, where vagally mediated response by acidification leads to bronchoconstriction.[3] The larynx and pharynx are devoid of the normal acid clearance mechanism, hence even 3 episodes of reflux per week seems to be associated with a significant disease.[4]

Belafsky et al developed the reflux symptom index (RSI) and reflux finding score (RFS).RSI questionnaire with 9 questions being answered on a 5 point scale. An RSI of more than 13 is considered to indicate LPR. RFS is based on laryngoscopic findings.This evaluates 8 items were a score of more than 7 indicates presence of LPR.[5]An accurate and timely diagnosis with the smallest probability of misdiagnosis, missed diagnosis, or delayed diagnosis is crucial for managing any disease.[6]When the diagnostic tools are less sensitive and specific, such errors are bound to occur. It can be overcome by combining diagnostic tools which have higher strength of correlation. So in this study we tried to correlate collection of symptoms and signs i.e. RSI and RFS, so that they could be better diagnostic tools when combined.

METHODS

This prospective analytical study was conducted from November 2019 to October 2020 in total of 65 patients presented in otorhinolaryngology OPD of Nepalgunj Medical College Teaching Hospital, Banke, Nepal. After random sampling 65 patients presenting with symptoms of LPR were enrolled for the study. Ethical clearance was obtained from institutional review committee (IRC).Precise history was taken, RSI were noted, nasopharyngeal laryngoscopy was performed and RFI were noted. RSI questionnaire with 9 questions were answered by patients on a 5 point scale. RSI of more than 13 out of total score of 45 was considered to indicate LPR were as, RFS was based on laryngoscopic findings after evaluating 8 items. Score more than 7 out of 26 was taken as an indicator of the presence of LPR.

Inclusion criteria: All patients more than 10 years old presented in OPD with all symptoms of LPR were included in the study.

Exclusion criteria: Children less than 10 years of age, patients with psychiatric illness, URTI within a month, vocal cord paralysis, laryngopharyngeal mass, seasonal allergies, untreated thyroid diseases, pregnant and lactating mother and who did not like to participate in the study were excluded in the study.

How did the problem listed below affect you within the last month		0 = no problem, 5 = severe problem					
		0	1	2	3	4	5
1.	Hoarsness or voice problems						
2.	Throat clearing						
3.	Excess mucus or post nasal drip						
4.	Difficulty in swallowing solid, fluids, tablet						
5.	Coughing after eating or lying down						
6.	Breathing difficulty or choking episodes						
7.	Annoying cough						
8.	Sensation of a lump or F.B in throat						
9.	Heart burn, chest pain, indigestion, reflux						
Total							

Laryngopharyngeal reflux is considered if RSI>13 (Belafsky et al.).

Table I: Reflux Symptoms Index (RSI).

	Findings	Score
1.	Subglottic edema	0 = absent, 2 = present
2.	Ventricular obliteration	0 = absent 2 = partial 4 = complete
3.	Erythema/hyperemia	0 = absent, 2 = only in the arytenoids, 4 = diffuse
4.	Vocal fold edema	0 = absent, 1= mild, 2 = moderate 3 = severe, 4= polypoid
5.	Diffuse laryngeal edema	0 = absent, 1 = mild, 2 = moderate 3 = severe, 4 = obstruction
6.	Posterior commissure hypertrophy	0 = absent, 1 = mild, 2 = moderate 3 = severe, 4 = obstruction
7.	Granuloma/ granulation tissue	0 = absent, 2 = present
8.	Thick endolaryngeal mucus	0 = absent, 2 = present
Total		

Laryngopharyngeal reflux is considered if RFS>7 (Belafsky et al.).

Table II: Reflux Finding Score (RFS).

Statistical Analysis

Data were analyzed using SPSS 20. Pearson's correlation test was used for analysis. 'p' value less than 0.01 was considered significant.

Strength of correlation was measured using the absolute criterion:

- 0 – 0.19: no correlation,
- 0.2 – 0.39: low correlation,
- 0.40 – 0.59: moderate correlation,
- 0.60 – 0.79: moderately high,
- ≥ 0.80: high correlation, report the correlation determinations, i.e. squared correlation coefficients.

RESULTS

Demographic Profile

There were 65 patients in the study. The age of the patient ranged from 17 years to 87years with mean age of 39.23±15.33 years. The present study shows female preponderance, female: male ratio= 42 (64.6%): 23 (35.3%).

S.N	Symptoms	Scores 0 = No Problem, 5 = Severe Problem					
		0	1	2	3	4	5
		n =65 (percentage %)					
1	Hoarseness	19 (29.2)	22 (33.8)	9 (13.8)	11 (16.9)	4 (6.2)	
2	Throat clearing	2 (3.1)	11 (16.9)	28 (43.1)	18 (27.7)	6 (9.2)	
3	Excess mucus or post nasal drip	27 (41.5)	21 (32.3)	14 (21.5)	3 (4.6)		
4	Dysphagia	42 (64.6)	6 (9.2)	12 (18.5)	5 (7.7)		
5	Coughing after eating/ Lying down	24 (36.9)	12 (18.5)	25 (38.5)	4 (6.2)		
6	Breathing Difficulty/ Choking	57 (87.7)	5 (7.7)	1 (1.5)	1 (1.5)	1 (1.5)	
7	Annoying Cough	51 (78.5)	7 (10.8)	5 (7.7)	2 (3.1)		
8	Globus	2 (3.1)	4 (6.2)	20 (30.8)	20 (30.8)	14 (21.5)	5 (7.7)
9	Heart Burn/ Reflux	3 (4.6)	17 (26.2)	24 (36.9)	10 (15.4)	11 (16.9)	

RSI>13 = 22 patients Mean RSI = 11.85±3.48

Table III: Symptoms in RSI and their occurrence.

S.N	Reflux Findings	Score	n =65 (percentage %)
1	Subglottic Edema	0=absent	63 (96.9)
		2=present	2 (3.1
2	Ventricular Obliteration	0=absent	55 (84.6)
		2=partial	10 (15.4)
		4=complete	-
3	Erythema/ Hyperemia	0=absent	-
		2=only in arytenoid	46 (70.8)
		4=diffuse	19 (29.2)
4	Vocal Fold Edema	0=absent	12 (18.5)
		1=mild	30 (46.2)
		2=moderate	21 (32.3)
		3=severe	1 (1.5)
		4=polypoidal	1 (1.5)
5	Diffuse Laryngeal Edema	0=absent	58 (89.2)
		1=mild	7 (10.8)
		2=moderate	-
		3=severe	-
		4=obstructive	-
6	Posterior Commissure Hypertrophy	0=absent	41 (63.1)
		1=mild	19 (29.2)
		2=moderate	4 (6.2)
		3=severe	1 (1.5)
		4=obstructive	-
7	Granuloma/ Granulation	0=absent	64 (98.6)
		2=present	1 (1.5)
8	Thick Endolaryngeal Mucus	0=absent	57 (87.7)
		2=present	8 (12.3)

RFS > 7= 11patients **Mean RFS = 5.02**±3.23

Table IV: Signs in RFS and their occurrence.

Coefficient of Determination (r^2): $0.595^2 = 0.354$
Hence only 35% of the occurrence of RFS is explained by the RSI.
There was moderate correlation between the obtained RSI and RFS.

		Total RSI Score	Total RFS
Total RSI Score	Pearson Correlation	1	0.595
	Sig. (2-tailed)		0.000
	N	65	65
Total RFS	Pearson Correlation	0.595	1
	Sig. (2-tailed)	0.000	
	N	65	65

Correlation is significant at the 0.01 level (2-tailed)

Table V: Correlations between RSI and RFS.

DISCUSSION

LPR is a multi-factorial clinical entity with multiple clinical presentations, so it requires a multidisciplinary approach. LPR presents with nonspecific symptoms and signs. Symptoms of LPR significantly overlap with symptoms of other disorders. To minimize the subjective evaluation of RSI, in 2001 Belafsky et al validated RFS as a diagnostic parameter of LPR.[5] The RFS has demonstrated high reproducibility and reliability of 94% with score above 7.However, Branski et al. concluded that only laryngoscopic finding as a diagnostic tool was highly subjective, so for evaluating the patients with LPR, RSI along with RFS will be helpful to override overlapping signs and symptoms with other disorders.[7] RSI and RFS are simple, noninvasive and inexpensive so, have been widely used for diagnosis of LPR.[8]Various diagnostic tools such as laryngoscopy, esophagoscopy, proximal pH monitoring etc. have been used for diagnosis of LPR. Yet a large number of studies confirm their specificity and sensitivity as low as 75-80%.[4]A better diagnostic approach for the early and accurate diagnosis of LPR is the current demand. Here we tried to correlate RSI and RFS, to find out the required better approach. In our study the age of the patient ranged from 17 years to 87years with mean age of 39.23±15.33 Female preponderance was seen in present study female 42 (64.6%) and male 23 (35.3%). In present study globus 96.9%, throat clearing 96.9% and heart burn/ Reflux 95.4% were the most common symptoms followed by hoarseness 70.7%, coughing after eating or lying down 63.2%, excess mucus/ PND 58.4% and dysphagia 35.4%. Similar findings were observed in the study by Erdas Karakays et al 2015 were the hoarseness, throat clearing, heartburn and globus were 98.2%, 92.7%, 86.3% and 71.3% respectively.[9]Similarly Satish et al. study shows heartburn 79.2% was the most common symptom followed by throat clearing 72.7% and globus 71.6%.[4]In present study, the most common signs were erythema/ hyperemia 100%, Vocal fold edema81.5%, posterior commissure hypertrophy 36.9%, least common signs were Granuloma/Granulation 1.5%, Subglottic edema3.1%, Diffuse Laryngeal Edema 10.8%. Similarly Erdas Karakays et al 2015 observed hyperemia 98.2%, vocal fold

edema 100%,and posterior commissure hypertrophy 100% followed by diffuse laryngeal edema , ventricular obliteration, subglottic edema were 98.2%, 71.3% and 36.2% respectively,[9] which is in contrast than present study. In another study done by satish et al. the most common finding was arytenoids congestion 70.1%, followed by vocal fold edema 15.6% and subglottic edema 13.6%.[4]

In present study RSI>13 was seen on 22 patients and mean of RSI was 11.85±3.48.Similarly, RFS > 7 was seen on 11patients and mean of RFS was 5.02±3.23.There was a statistical correlation between RSI and RFS, though the strength of correlation was moderate (r=0.595, p=0.000). According to the coefficient of determination calculated only 35% occurrences of RFS were explained by the RSI. Similar to our study, a study done by M Gelard et al. in 3932 patients with LPR showed that a moderate correlation exited between RSI and RFS (r=0.484, p<0.0001).[10]

Mesallam and stemple on 40 patients showed statistically significant correlation between the RFS and RSI (r = 0.86; p< 0.0001).[11]similarly, in another study done by Vázquez de la Iglesia et al on 34 patients, a statistically significant correlation was found between the RSI and RFS (r = 0.3, p = 0.007).[12]Unlike all these studies, Satish et al study result shows no correlation between the RSI and RFS (p=0.501).[4]

LIMITATION

The post treatment correlation between reflux symptom index and reflux finding score has not done in the present study.

CONCLUSION

LPR is a common entity. There is a moderate correlation between the reflux symptom index and reflux finding score. The combined use of questionnaires and laryngoscopic findings can be more precise, practical and cost effective way to diagnose LPR.

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A Study on Correlation Between Serum Cholinesterase Level and Clinical Severity Based on Pop Scale in Organophosphorus Poisoning

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ABSTRACT

Introduction: Organophosphorus (OP) compounds are the most commonly used pesticides worldwide and Organophosphorus poisoning has become the major public health problem especially in developing countries.The case fatality rate following ingestion of Organophosphorus pesticides in developing countries in Asia is 5-20%.Due to limited availability of facilities and resources in Nepal, it is important to prioritize treatment based on severity of poisoning as all patients can't be managed in Intensive Care Unit. **Aim**: To study the correlation between serum cholinesterase level and clinical severity based on Peradenya organophosphorus poisoning scale in Organophosphorus poisoning. **Methods**: The study was conducted in the department of Medicine, Nepalgunj Medical College, Kohalpur, Banke from November 2019 to November 2020. It is based on the descriptive study of 66 patients with Organophosphorus poisoning attending to the emergency department. All patients with history of exposure to Organophosphorus poisoning were included in the study. Peradenya Organophosphorus Poisoning scale was used to assess the clinical severity as mild, moderate and severe. At the same time venous blood samples were collected for serum cholinesterase level. **Results**: Age group ranged from 16-60 years and majority of patients were in the age group of 20-29 years (34.85%). 53% were females. 74.2% of the patients were from lower socioeconomic status. 83.3% of the patients consumed poison with suicidal intention. Majority of the patients were from tharu ethinicity (40.9%) and were farmers (30.3%). It was observed that there is significant correlation between serum cholinesterase level and severity of poisoning based on Peradenya Organophosphorus Poisoning scale at initial presentation (p value <0.001). **Conclusion:** There is significant correlation between severity of poisoning and degree of derangement of serum cholinesterase level at the initial presentation. As the facility for the estimation of serum cholinesterase level is not available in all regions of Nepal.

Keywords: Organophosphorus (OP) compound, POP scale, Serum cholinesterase

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INTRODUCTION

Organophosphorus compounds are the most commonly used pesticides worldwide and OP poisoning has become the major public health problem especially in developing countries.[1]The mortality due to various poisonings as estimated by World Health Organization is around 3 million per year globally, out of which around 2,50,000 and 3,50,000 deaths are due to OP poisoning.[2-4] The case fatality rate following ingestion of OP pesticides in developing countries in Asia is 5-20%.[5] OP compounds are used largely in agricultural countries like Nepal and India for farming purpose. Most of the reported cases are in young adults especially females, farmers and from lower socio-economic status.[6-8] The survival in OP poisoning depends upon the severity of poisoning and initiation of treatment. Due to limited availability of facilities and resources in Nepal, it is important to prioritize treatment based on severity of poisoning as all patients cannot be managed in Intensive Care Unit. Hence, severity of poisoning needs to be ascertained based on either clinical or laboratory assessment. The Peradenya Organophosphorus Poisoning (POP) scale assess the severity of poisoning based on symptoms at presentation and is simple to use. In a study by Senayoke et al, patients with severe grade

on the POP scale had a high rate of mortality and morbidity.[9]OP compounds act by inhibiting Cholinesterase irreversibly which leads to accumulation of acetylcholine at synapses causing overstimulation of acetylcholine receptors and disruption of neurotransmission in both central and peripheral nervous systems. So, it is reasonable to estimate serum ChE level to assess the severity of OP poisoning.[10-11]

METHODS

This is a hospital based descriptive study of 66 patients with OP poisoning attending to the emergency department of NGMCTH, Kohalpur, Nepal. The study was conducted at department of Medicine from November 2019 to November 2020. The study was approved by institutional review committee (IRC) Nepalgunj Medcial College and Teaching Hospital, Kohalpur, Banke. Informed consent of the patient or guardian was taken. All patients with history of exposure to OP poison were included in the study. The present study aims to correlate serum ChE level and the clinical severity described by the POP scale at initial presentation. Patients with age <16 years, exposure to poison other than OP compound, OP poison mixed with any other poison, patients who were treated elsewhere were excluded from the study. A detailed history and complete clinical examination were carried out. The diagnosis was made based on history, characteristics clinical signs and symptoms like miosis, excessive salivation, altered consciousness, fasciculation, etc, improvement of sign and symptoms with administration of atropine, corroborative evidence like empty container and odour of gastric aspirates. POP scale was used to assess the clinical severity. A score of 0 to 3 is considered as mild, 4 to 7 as moderate and 8 to 11 as severe poisoning. At the same time venous blood samples were collected for serum ChE along with other routine investigations. Serum ChE level was estimated with reference range of 4620-1150 IU/L. Based on the serum ChE levels, the severity of poisoning was defined as per Kumar et al.[12]

- Latent – serum ChE level >50% of normal or >2310 IU/L
- Mild poisoning- Serum ChE level 20-50% of normal or 925-2310 IU/L
- Moderate poisoning - Serum ChE level 10-20% of normal or 463-924 IU/L
- Severe poisoning - Serum ChE level ≤20% of normal or ≤462 IU/L

Data was analyzed using Standard statistical method including SPSS 25.0. The test applied was Fischer's exact test. A p value of <0.05 was considered to be significant.

RESULTS

A total of 66 patients with the diagnosis of OP poisoning were enrolled in the study. Age group ranged from 16-60 years and the mean age was 33.57 years. Majority of the patients were in the age group of 20-29 years which comprised of 23 (34.85%) patients as shown in table I.

Age Group	No. of cases	Percentage
<20	5	7.57
20-29	23	34.85
30-39	18	27.28
40-49	10	15.15
≥ 50	10	15.15
Total	**66**	**100**

Table I: Age distribution.

Out of 66 patients, 31 (47%) were male and 35 (53%) were female with M:F ratio of 0.88:1 showing female predominance. In this study, 44 (66.7%) patients were married, 22 (33.3%) patients were unmarried. 49 (74.2%) patients were from lower socioeconomic status whereas 17 (25.8%) patients were from middle class. Most of the patients (83.3%) had suicidal intention as shown in table II.

Parameters	Values n (%)
Gender	
Male	31 (47%)
Female	35 (53%)
Marital Status	
Married	44 (66.7%)
Unmarried	22 (33.3%)
Socioeconomic Status	
Lower	49 (74.2%)
Middle	17 (25.8%)
Intention	
Suicidal	55 (83.3%)
Accidental	11 (16.7%)

Table II: Characteristics of patients.

Maximum number of patients belonged to Tharu community which was 40.9% as shown in table III.

Ethnicity	Number	
Tharu	27	
Magar	10	15.2
Brahmin	9	13.6
Chettri	6	9.1
Others	14	21.2
Total	**66**	**100**

Table III: Ethnicity.

In the present study, major group was constituted by farmers followed by students which were 30.30% and 24.24% respectively as shown in table IV.

Occupation	Number	Percentage
Farmer	20	30.30
Student	16	24.24
Housewife	12	18.20
Labour	9	13.63
Job Holder	7	10.60
Unemployed	2	3.03
Total	**66**	**100**

Table IV: Occupation of the patients.

Most common clinical features were vomiting, excessive salivation, miosis, bradycardia and altered consciousness as shown in figure 1.

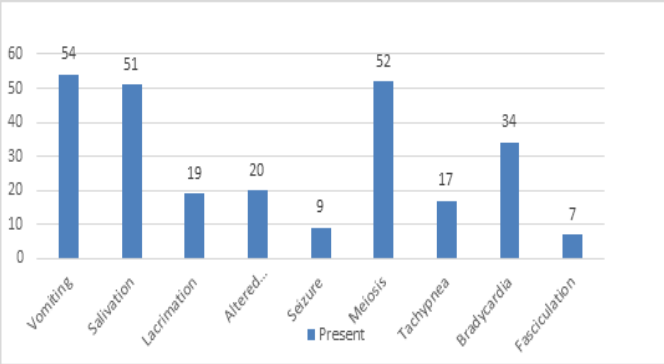

Figure 1: Signs and symptoms at presentation.

According to the POP scale, 39 (59.1 %) patients had mild grade of poisoning with a POP scale of less than 4. 5 (7.6%) patients belonged to severe grade with a POP score more than 7, as shown in table V.

POP Scale	Number	Percentage
Mild	39	59.1
Moderate	22	33.3
Severe	5	7.6
Total	**66**	**100**

Table V: Severity according to POP Scale.

On the basis of serum ChE level, 31 (47%) patients belonged to latent grade (>50% of normal), 30 (45.5%) patients in mild grade (20-50%), 4 (6.1%) in moderate grade (10-20%) and 1 (1.5%) in severe grade (<10%) of poisoning as shown in table VI.

Serum Choline-esterase level	Severity	Number	Percentage
>2310 (>50% of normal)	Latent	31	47.0
925- 310 U/L (20-50%)	Mild	30	45.5
463-924 U/L (10-20%)	Moderate	4	6.1
≤ 462 U/L (<10%)	Severe	1	1.5
Total		**66**	**100**

Table VI: Severity of poisoning according to Serum Cholinesterase level.

Out of 39 mild cases, according to POP scale, 27 patients had serum ChE level >50% of normal and 12 patients has between 20-50%, whereas out of 5 severe cases, according to POP scale, 4 patients had serum ChE level between 10-20% and 1 patient had <10% as shown in table VII.

POP scale	Serum cholinesterase levels				
	>2310 (>50% of normal)	925-2310 (20-50%)	463-924 (10-20%)	≤462 (<10%)	Total
	27	12	0	0	39 (59.1%)
Moderate (4-7)	4	18	0	0	22 (33.3%)
+++++ Severe (>7)	0	0	4	1	5 (7.6%)
Total	**31 (47%)**	**30 (45.5%)**	**4 (6.1%)**	**1 (1.5%)**	**66 (100%)**

Normal serum cholinesterase level: 4620-11500 U/L; Fischer's Exact Test= 43.543 with p-value <0.001 (highly significant).

Table VII: Comparison of severity according to serum cholinesterase levels versus POP scale.[11]

DISCUSSION

OP compound poisoning is the global health burden with particularly high prevalence rate in developing countries. In present study, majority of patients *(34.85%) were in the age group of 20-29 years and 69.7% of patients belonged to age group of <40 years. This is comparable to the studies done by Rehiman S et al[13], Agrawal V et al[14], Bhattacharya K et al[15], Kavya ST et al[16], Honnakatti V et al[17] which also showed that OP poisoning was much more common in younger age group.The present study showed female predominance (53%) over male (47%) with a ratio of 1.12:1. Similarly, female predominance was reported by Rehiman S et al[13], Kafle K et al[18], Twayana RS et al[19]. In present study, majority of patients were from tharu community, low income group and farmers. Dominance of tharu ethnicity in this study reflects the demography of this area where 18% population comprises of tharu[18] and their main occupation is agriculture and thus, they have an easy access to OP compound which is widely used in Nepal for farming purpose. This study revealed that 86.3% patients consumed OP compound with suicidal intention. Similar finding was reported by Honakatti V et al[17](84%) and Agrawal V et al[14]. Significant number of patients (16.7%) had accidental ingestion of poison which might be due to alcohol influence and uneducated background of the people. A retrospective analysis of poison cases done by TUTH revealed 6% of accidental poisoning among 178 study subjects.[21] In this study, common signs and symptoms at presentation were vomiting, excessive salivation, miosis, bradycardia, altered consciousness. Similar manifestations were reported by Rehiman S et al[13], Twayana RS et al[19], Bhattarai MD et al[22] and EddlestonM et al[1].

In the present study, out of 39 mild cases according to POP scale, 27 patients had serum ChE level >50% of normal and

12 patients had 20-50%. In contrary to that, all 5 severe cases according to POP scale had serum ChE level <20% of normal i.e. as the grade of poisoning is increased, more was depression in serum ChE level. This shows the significant correlation between the severity of poisoning categorized by POP scale and the serum ChE at the time of initial presentation of the patients and the p value is highly significant (p value <0.001).

LIMITATION

This was a single hospital based descriptive study with a relatively smaller sample size. Thus, a prospective study including larger sample is needed.

CONCLUSION

POP scale and serum ChE level are an important tool for the assessment of severity of OP poisoning. As the severity of the POP scale increases, degree of derangement of serum ChE level also increases. The facility for estimation of serum ChE level is not available in many regions Nepal. In such condition, POP scale can be used to access the severity of OP poisoning.

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Efficacy of Oral Azithromycin versus Doxycycline in the Treatment of Acne Vulgaris

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ABSTRACT

Introduction: Acne vulgaris is one of the most common skin disease affecting adolescence of either sex, globally. Antibiotics like macrolides and tetracycline have been used with good results, studies comparing their efficacy are lacking. The present study compare the efficacy of Azithromycin v/s Doxycycline in acne vulgaris. **Aims:** To compare the efficacy of Azithromycin and Doxycycline in the treatment of acne vulgaris. **Methods:** This is a prospective hospital based comparative study, conducted on 80 patients attending outpatient department of Dermatology, Nepalgunj Medical College Teaching Hospital with acne vulgaris from July 2019 to April 2020. Patient were divided alternately into two groups, Group A received Azithromycin (n=40) and Group B Doxycycline (n=40) and compared the effects of treatment at 6 and 12 weeks. Efficacy assessment was done according to simple acne grading system. **Results:** Acne was predominant in female (62.5%) as compared to male (37.5%). Patient between 16 to 20 years age group were more prone to acne (47.5%). Most of the patients had Grade II acne before treatment in both groups (Azithromycin 52.5%, Doxycycline 55%). After the treatment most of them improve to Grade I at 6 weeks (Azithromycin 50%, Doxycycline 55%) and to Grade zero at 12 weeks (Azithromycin 42.5%, Doxycycline 67.5%).There was no statistically significant difference in treatment efficacy between the two groups at 6 weeks but at 12 weeks efficacy of Doxycycline was significantly better than Azithromycin. **Conclusion:** Both oral Azithromycin and Doxycycline when given for treatment of acne vulgaris the analysis showed good improvement after 6 weeks of treatment but there was no statistically significant difference in the improvement in both groups (p 0.771). However after 12 weeks patient receiving Doxycycline showed statistically significant improvement (p 0.035) in comparison to the patients receiving Azithromycin.

Keywords: Acne vulgaris, Azithromycin, Doxycycline, Efficacy

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INTRODUCTION

Acne vulgaris is one of the most common chronic inflammatory disease with a prevalence rate of 9.4% globally, making it the eighth most prevalent disease throughout the globe[1] The condition usually initiates around the age of 12 to 14 years and their prevalence decreases after 18 years.[2,3] However, population and sex-based epidemiological studies show that it persists (7 to 17%) beyond the age of 25 years[4] and tend to effect women at higher rate than male.[5] Clinical manifestation is characterized by comedones, papules, pustules, nodules, cysts and scars.[6] The pathogenesis is multifactorial, which includes androgen-mediated stimulation of sebaceous gland activity, abnormal keratinization leading to follicular plugging, inflammation of the follicle, and surrounding dermis due to Propionibacterium acnes.[7] Besides above-mentioned conditions this disease tends to affect and has a direct correlation with patients self-image, impacting considerably on their emotional, physical appearance, health and quality of life.[8] Many therapeutic options exist for treating acne including topical and oral antibiotics.[9] For the last 2 to 3 decades, systemic antibiotics, mainly tetracycline and macrolides, have been used as first-line treatment in the management of acne patients.[10] The efficacy of these agents depends on their ability to reach the lipid-rich environment of the pilosebaceous follicles and inhibition of protein synthesis of P. acnes, thus exerting bacteriostatic, and sometimes bactericidal effects. Thus, the choice of systemic antibiotic agents for treating acne include Azithromycin and Doxycycline in clinical practice worldwide.[11] Further more severe adverse effects of systemic antibiotics in person treated for acne are uncommon.[12]

METHODS

This prospective comparative study was conducted from July 2019 to April 2020 on 80 patient who presented with acne vulgaris in outpatient department of Dermatology, Nepalgunj Medical College Teaching Hospital, Banke, Nepal. Ethical clearance was obtained from institutional review committee (IRC) NGMC. Thus this study was undertaken to compare the efficacy of Azithromycin and Doxycycline respectively in the treatment of acne vulgaris.

Patients with acne vulgaris of grade II, III, and IV, between 13 to 35 years of both gender and who gave consent to participate in the study were included. Pregnant, lactating mothers and patient under medications like isotretinoin, oral contraceptives etc. which could possibly interfere with the course of disease were excluded. After selecting alternatively 80 acne vulgaris patients meeting our criteria were taken in 12 weeks therapy plan. Patients were divided into two groups: Group A (n=40) were scheduled to receive oral Azithromycin 500mg once daily three times a week, and Group B (n=40) who received oral Doxycycline 100mg once daily. Topical Adapalene 0.1% was given to all the patients.

Severity of acne was assessed using Simple Acne Grading System.[13]

Grade I: Comedones, occasional papules.
Grade II: Papules, comedons, few pustules.
Grade III: Predominent pustules, nodules, abscesses.
Grade IV: Mainly cysts, abscesses, widespread scaring.

Post treatment follow up: Patients were followed up after 6 weeks and 12 weeks. If the patient after treatment went into lower grades from the higher grades as for example Grade IV to III, Grade III to II, Grade II to I and some patients to Grade zero (The patient were placed in Grade zero if there was nonexistence of the lesion at the end of treatment) it was considered as a criteria of improvement.

Statistical Analysis

Data was analysed using SPSS20. Chi square test, Fisher's exact test and Wilcoxin signed ranks test were used. 'p' value less than 0.05 was considered significant.

RESULTS

In our study, out of 80 patients, 30 (37.5%) were males and 50 (62.5%) were females. The data demonstrates female predominance in symptoms ratio as compared to male patients. This study further showed that the prevalence of acne was highest among the age group 16 to 20 (47.5%), as compared to other age groups namely, 10 to 15 (18.75%), 21 to 25 (18.75%), 26 to 30 (12.5%) and 31 to 35 (2.5%) respectively.

The mean age of acne vulguris was 20.1±4.74 for Azithromycin and 19.35±4.89 for Doxycycline respectively. There was no significant difference in age (p value 0.489).

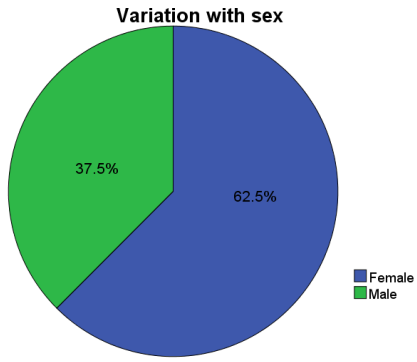

Figure 1: Comparison of gender between the groups.

Gender distribution in female was higher in both the groups

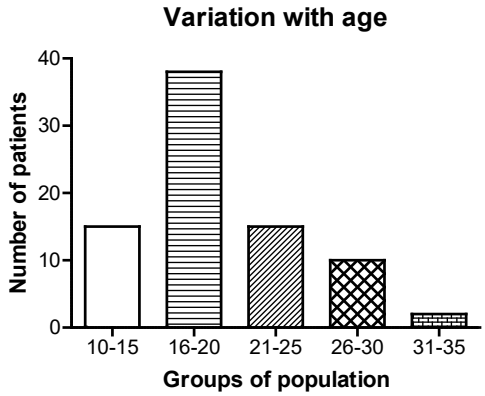

Figure 2: Variation with age.

Most of the patients were between 16-20 years of age.

Treatment Group	Pre-treatment Grade of Acne			Total	Exact Sig. (2 sided)
	Grade II	Grade III	Grade IV		
Group A	21 52.5%	12 30%	7 17.5%	40 100%	
Group B	22 55%	7 17.5%	11 27.5%	40 100%	0.328
Total	**43 53.8%**	**19 23.8%**	**18 22.5%**	**80 100%**	

Table I: Comparisons of pre-treatment grade of acne between the groups.

There was no any statistically significant difference in pre-treatment grade of acne between the two groups.

Treatment Group	Treatment at 6 weeks						Exact Sig. (2 sided)
	Grade zero	Grade I	Grade II	Grade III	Grade IV	Total	
Group A	0 0%	20 50%	15 37.5%	5 12.5%	0 0%	40 100%	
Group B	0 0%	22 55%	12 30%	6 15%	0 0%	40 100%	0.771
Total	**0 0%**	**42 52.5%**	**27 33.8%**	**11 13.8%**	**0 0%**	**80 100%**	

Table II: 6 weeks follow up analysis of the treatment efficacy between the groups.

At 6 weeks there was no any statistically significant difference in grade of acne between the two groups.

Treatment Group	Treatment at 12 weeks						Exact Sig. (2 sided)
	Grade zero	Grade I	Grade II	Grade III	Grade IV	Total	
Group A	17 42.5%	17 42.5%	6 15%	0 0%	0 0%	40 100%	0.035
Group B	27 67.5%	12 30%	1 2.5%	0 0%	0 0%	40 100%	
Total	**44 55%**	**29 36.2%**	**7 8.8%**	**0 0%**	**0 0%**	**80 100%**	

Table III: 12 weeks follow up analysis of the treatment efficacy between the groups.

At 12 weeks Doxycycline group showed statistically significant improvement in grade of acne in comparison to Azithromycin group.

Treatment Group	Side Effects						
	None	Nausea	Abdominal pain	Diarrhoea	Headache	Photo-sensitivity	Total
Group A	**34 85%**	**2 5%**	**3 7.5%**	**1 2.5%**	**0 0%**	**0 0%**	**40 100%**
Group B	**31 77.5%**	**5 12.5%**	**1 2.5%**	**0 0%**	**2 5%**	**1 2.5%**	**40 100%**
Total	**65 81.2%**	**7 8.8%**	**4 5%**	**1 1.2%**	**2 2.5%**	**1 1.2%**	**80 100%**

Table IV: Comparison of side effects between the two groups.

The result shows that most of the patient had Grade II acne before treatment in both groups (Azithromycin 52.5%, Doxycycline 55%).After the treatment at 6 weeks Group A patients receiving Azithromycin 50% were in Grade I, 37.5% in Grade II, 12.5% in Grade III where as in Group B patients receiving Doxycycline 55% were in Grade I, 30% in Grade II and 15% in Grade III. Although the treatment with Doxycycline showed a marginal difference in the improvement rate it was statistically not significant (p 0.771). After the treatment at 12 weeks Group A patients receiving Azithromycin 42.5% were in Grade zero, 42.5% in Grade I, 15% in Grade II where as in Group B patients receiving Doxycycline 67.5% were in Grade zero, 30% in Grade I and 2.5% in Grade II. The treatment with Doxycycline showed overall improvement which was statistically significant (p 0.035).

DISCUSSION

Acne vulgaris is the most common chronic inflammatory skin disease affecting in late adolescence throughout the globe and affecting the population of both the sex, the medication for the treatment of choice is still lacking.[6,14] Systemic antibiotics have been the mainstay of treatment for moderate to severe acne vulgaris to date. The effectiveness of several antibiotics, including oxytetracycline, minocycline, doxycycline, erythromycin and azithromycin, in treating acne has been established.[6,8] Clinical efficacy is often noticed within 6 to 8 weeks of antibiotics inititation but can be given for 12 to 18 weeks or even more.[15] In this study we tried to compare the efficacy of oral azithromycin with doxycycline in treatment of acne vulgaris. A study by Adityan et al has shown that acne has female preponderance in comparison to male and the average age of patient presenting with acne vulgaris in outpatient department was 19.78± 4.94.[13] Similar to the study done by Aditya et al the present study shows female preponderance, female: male ratio = 62.5% : 37.5%. Further other studies also have shown that age around 15 to 18 has been the dominant phase of acne development.[14] The result of our study shows 16 to 20 years age group are more prone to acne vulgaris. These results validate that the development of the disease and the effecting group is almost similar throughout the globe. In our study there was significant improvement in treatment outcome at both 6 and 12 weeks in both azithromycin and doxycycline groups. This study is in consistent with study done by Kus S, Yucelten D, Aytug A, where both azithromycin and doxycycline given for treatment of acne vulgaris showed significant improvement for the facial lesion.[16] Similarly, study done by Amatya A et al showed both azithromycin and doxycycline are effective in treatment of acne.[11] Study done by Kumar S et al. also shows that both azithromycin and doxycycline have good outcome in acne vulgaris.[6] There is no any statistically significant difference between their response when compared with each other at 6 weeks but there was significantly better outcome in Doxycycline group at 12 weeks follow-up (p=0.771, p=0.035 respectively). A study done by Maleszka et al[17] showed that there was consistently higher reduction in acne lesions with doxycycline than azithromycin treatment. A study done by Kus S, Yucelten D, Aytug A, showed that the efficacy of Azithromycin and Doxycycline given for treatment of acne vulgaris had no significant difference between the treatment outcome.[16] In contrast to our study, a study done by Gruber F et al[18] showed that azithromycin is more effective in the treatment of acne, when compared with doxycycline. Similarly, the study conducted by Singhi MK et al. found that there was a significant difference between the severity reduction with azithromycin when comparing the effects of azithromycin and doxycycline ($p < 0.01$).[10]

The present study shows better outcome in 12 weeks treatment when compared with 6 weeks treatment with either drugs. A study done by Innocenzi et al. also suggested that for best therapeutic result systemic antibiotics should be continued till 12 weeks.[8] Patients in Doxycycline group experienced more side effects 22.5% compared to patients in group Azithromycin 15%. Similar to our study a study done by Amatya A et al patients in Doxycycline and Azithromycin group experienced side effects 22.6% and 20% respectively. Although there are few more side effects with Doxycycline in comparison with Azithromycin, 12 weeks treatment with Doxycycline gives better outcome in treatment of acne vulgaris and also is cheaper than Azithromycin. So Doxycycline can be the better alternative to Azithromycin and the treatment of choice for poor patients.

LIMITATION

The limitation of this study was small sample size, we did not explore the menstrual cycle of the female.

CONCLUSION

Both oral Azithromycin and Doxycycline when given for treatment of acne vulgaris the analysis showed good improvement after 6 weeks of treatment but there was no statistically significant difference in the improvement in both groups (p 0.771). However after 12 weeks, patient receiving Doxycycline showed statistically significant improvement (p 0.035) in comparison to the patients receiving Azithromycin. Though Doxycycline produces more side effects like nausea, headache, and photosensitivity whereas abdominal pain, nausea and diarrhoea is common in Azithromycin.

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Screening of Diabetes in Pregnancy at Nepalgunj Medical College Teaching Hospital Kohalpur

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ABSTRACT

Introduction: Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance of variable severity or hyperglycemia occuring for the first time during pregnancy but the glucose intolerance reverting back to normal after the puerperium. According to American Diabetic Association, approximately 7% of all pregnancy are complicated by Gestational Diabetes Mellitus, resulting in more than two lakhs cases annually and the prevalence may range from 1-14% of all pregnancies. Gestational Diabetes Mellitus usually develop in the second trimester and carries grave prognosis both for mother and fetus. So screening of diabetes is necessary for early detection of diabetes and prevention of further progression. Aims: Screening of impaired glucose tolerance and gestational diabetes mellitus by glucose challenge test(GCT) and oral glucose tolerance test (OGTT) at 24-28 weeks of pregnancy. Methods: This study was conducted in Nepalgunj Medical College Teaching Hospital over one year period taking 98 pregnant women who came to ANC (Antenatal Check up) out patient department. Screening for diabetes was done giving 50 gm of oral glucose(glucose challenge test) to the pregnant women at 24-28 weeks of gestational age. Results: The incidence of Impaired glucose tolerance and gestational diabetes in this study population was 4.1% and 1% respectively. **Conclusions**: Screening of Diabetes mellitus in Second trimester of pregnancy is important investigation to be done to prevent the mother and the fetus from many upcoming complications of diabetes.

Keywords: Gestational Diabetes Mellitus, Glucose intolerance, Screening

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INTRODUCTION

The worldwide prevalence of DM (Diabetes Mellitus) has risen dramatically over past two decades. A recent estimate suggested that diabetes was the fifth leading cause of death worldwide and was responsible for almost 4 million deaths in 2010.[1]Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance of variable severity or hyperglycemia occuring for the first time during pregnancy but the glucose intolerance reverting back to normal after the puerperium. Inability of the insulin secreting cell to meet the increased demand and decreased insulin sensitivity due to placental hormones are the basic abnormalities in the Gestational Diabetes Mellitus.[2]

The prevalence may range from 1-14% of all pregnancies.[3] A study from Nepal found that 3.67% of pregnancies had positive screening test values and 0.66% were diagnosed having Gestational Diabetes.[4]This justifies routine screening for diabetes during pregnancy. The concerns for Gestational Diabetes Mellitus are foetal macrosomia,obstructed labour, shoulder dystocia, birth injuries as well as neonatal hypoglycemia and ketoacidosis etc.[5,6,7] But controversy is, whether screening for diabetes during pregnancy should be routine or limited to patients at risk for diabetes. Studies done by Studd J [8] and Coustan DR, et al [13] emphasized the universal screening of diabetes. A study conducted by A. Mc Elduff and associates concluded that the 50-gram glucose load is better at detecting abnormalities in glucose tolerance.[12] Study done by Cosson E and et al suggested that, universal rather than selective screening for GDM may improve outcomes .[15] Friedman S et al favored a cut off of 130mg/dl.[17]

METHODS

This study is Hospital based observational study conducted in the department of Obs./Gynae, Nepalgunj Medical College Teaching Hospital, Kohalpur over a period of one year from August 2019 to July 2020. Total of 98 pregnant women who came for the antenatal checkup were included in the study

meeting the inclusion criteria.The sampling technique of this screening procedure was purposive sampling. Women coming to antenatal outpatient door, at 24-28 weeks of gestation(calculated on basis of first day of last menstrual period or on basis of early scan available), meeting inclusion criteria were enrolled for study after attaining written consent.

Inclusion Criteria

- Women coming for antenatal checkup between 15-45 yrs of age.
- Patient reported between 24-28 weeks of gestation.

Exclusion Criteria

- Known cases of Diabetes Mellitus.
- Patient on medication that can alter the plasma glucose level (glucocorticoids, thiazide diuretics, beta blockers etc).
- Diagnosed intrauterine fetal death.
- Women who refused to participate in the study.

There were altogether 98 patients meeting the inclusion criteria during the study period of one year. Patient particulars, age, LMP(Last menstrual period), EDD(Expected date of delivery), gestational age, detailed obstetric history including gravida, parity, abortion and previous live pregnancies,previous pregnancy complications, total no of ANC visit, signs and symptoms of Diabetes Mellitus, Family history of DM, height and weight of patients, BP, fundal height and results of tests were entered in a predesigned proforma.

In the proposed study the patient meeting inclusion criteria were screened for gestational diabetes by administrating 50 gram glucose and measuring the venous plasma glucose 1 hr later. Patient with more than or equal to 140 mg/dl plasma glucose level were followed by 3 hr Glucose Tolerance Test except those whose 1 hr screening test demonstrated plasma glucose values more than 200 mg/dl because patient with this markedly abnormal response to the sugar load are diabetic and need treatment without further testing. The 3 hr Glucose Tolerance Test were performed by measuring fasting plasma glucose level; and then orally administrating 100 gram glucose and measuring the venous plasma glucose 1 hr, 2 hr, 3 hr later. The normal values for Glucose Tolerance Test are as described by Carpenter and Coustan [11] i.e.

- Fasting 95 mg/dl
- One hour 180 mg/dl
- Two hour 155 mg/dl
- Three hour 140 mg/dl
- If two or more of these values are abnormal , the patient has diabetes.

There were 4 patients with abnormal GCT and one of them were positive for Oral GTT. Data analysis was done by Statistical Package for Social Sciences (SPSS- version16) Software. Categorical variables were compared by Chi-square test. Fischer exact test was used for categorical variables when the expected frequency in 2x2 tables was < 5; numerical variables were compared by t-test. Pearson's correlation coefficient was used to assess correlation.

RESULTS

Age(years)	Total (n=98)	Parity			
		0	%	1-4	%
15-19	14 (14.2%)	14	100	0	0
20-24	42 (42.8%)	20	47	22	53
25-29	32 (32.6%)	18	56	14	44
30-34	8 (8.1%)	0	0	8	100
35-40	2 (2%)	0	0	2	100
Total	**98**	**52**	-	**46**	-

Table I: Age and Parity distribution of patients screened for GCT

The proportion of women who did not have children were maximum about 100% among age group of 15-19 years and who had 1-4 children its was 100% in age group of 30-34 and 35-40 years. There were no women without any children from the age group of 30-40 years. Similarly there were no women from the age group of 15-19 years with 1-4 children. Maximum number of women who were pregnant was of the age group 20-29 years. Similarly there were more women from the same age group with no children and women who had 1-4 children. (Table I)

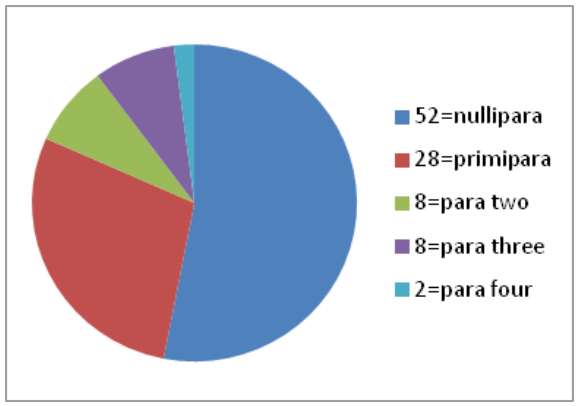

Figure 1: Pie diagram showing number of women according to different parity.

The maximum number of women were nulliparous (n=52) and minimum number of women had parity fours (n=2). Similarly the women with primipara (n=28) was in second majority whilst the women who were Para two and three were same in number (n=8). (Figure 1).

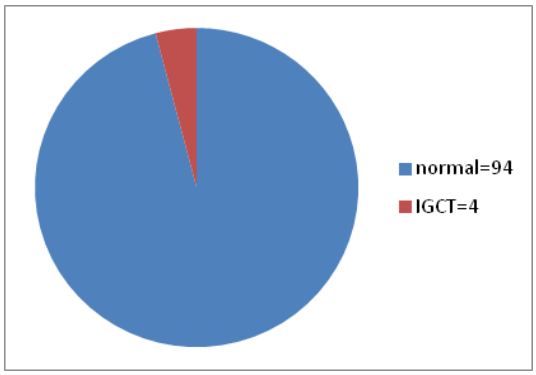

Figure 2: Pie diagram showing cases with normal and abnormal GCT values.

Out of 98 patients enrolled for the study 94 patients (95.9%) had normal GCT while 4 patients (4.1%) had abnormal GCT test values. (Figure 2)

GCT values (mg %)	No of patients with GDM	
<140	94(95.9%)	-
>140	4(4.1%)	1(1%)

Table II: Result of GCT and GDM patients according to glucose level

Out of 98 patients, 94(95.9%) had normal GCT value. Only 4(4.1%) had abnormal GCT value i.e. blood glucose level more than 140mg%. Out of which one (1%) of them was diagnosed as a case of GDM. (Table II)

GCT values (mg %)	Gestational age (weeks)		
	24-25	26-27	28
<140	14	46	34
>140	2	2	-
Total	**16**	**48**	**34**

Table III: Result of GCT according to gestational age of patients.

Out of 4 cases with abnormal GCT value, 2(50%) were of gestational age 24-25 weeks and 2(50%) were of gestational age 26-27 weeks. Out of 2 women with abnormal GCT values of gestational age 24-25 weeks one had GDM. The women with GDM were of gestational age 24 weeks. Women with gestational age 28 weeks did not have any abnormal GCT value. (Table III)

GCT values	Total	Parity				
		0	1	2	3	4
<140	94	52	28	8	6	0
>140	4	0	0	0	2	2
Total	**98**	**52**	**28**	**8**	**8**	**2**

Table IV: GCT values according to different parity.

Out of total 98 women, 94 patients had normal GCT values. Among them 52 were nulliparous, 28 were primipara, 8 were Para two, 6 were Para three and none were Para four. Four women had abnormal GCT values. Out of which 2 were Para three and 2 were Para four. So, all the four cases with abnormal GCT were multiparous women. Among them the women who was diagnosed of having GDM was of Para three. (Table IV)

Age(years)	N	Gestational weeks		
		24-25	26-27	28
15-19	14	-	-	-
20-24	42	-	-	-
25-29	32	-	-	-
30-34	8	2 (100%)	-	-
35	2	-	2 (100%)	-
Total		**2**	**2**	**-**

Table V: Abnormal GCT according to age and gestational age of patients.

Out of 4 cases of abnormal GCT values, 2(50%) were of age group 30-34 years between 24-25 weeks of gestational age. Similarly the other 2 cases were of age group 35 years between 26-27 weeks of gestational age. There were no abnormal GCT values in the women with gestational age of 28 weeks.

So the abnormal GCT values were seen in patients with elderly age group but in the early gestational age as compared to nil value in younger age groups with late gestational age. (Table V) In this study the mean height was 152 cm with the SD of 3.61. Similarly mean weight was56 kg with the SD of 6.25. The mean age was 23 years with the SD of 4.16. Mean BMI of the women was 24.3 with a SD of 2.82. Analyzing different variables with GCT values, there was a significant correlation of age with higher GCT value (P value 0.017). Whereas other variables: weight in kg, Family history of diabetes and BMI had non-significant P values.

DISCUSSION

The present study was conducted on 98 women of gestational age 24-28 weeks for impaired glucose tolerance and diagnosis GDM if any. The women were screened for gestational glucose intolerance by ingestion of 50-gram glucose without any dietary preparation and were done along with the other routine antenatal investigations. In 1973, O' Sullivan et al in Boston, proposed that a single sample of glucose tolerance done without dietary preparation could provide an acceptable screening method. Thus came out about the 50 gram glucose challenge test. The threshold value was taken 130mg/dl (7.2mmol/l). Women having positive screening value were subjected to oral glucose tolerance test. In our study the threshold value was taken as 140mg/dl so that the sensitivity of the test could be more precise because values below 140mg/dl were seen to be non-diabetic when confirmed by oral glucose tolerance test. The 1990 Chicago Workshop Conference on gestational diabetes mellitus also recommended that all pregnant women should be universally screened using a 50-gram glucose challenge test between

24-28 weeks.[4] There is substantial evidence in the medical literature for indication that screening should be universal. One study found that if only high risk patients are screened, approximately 35% of gestational diabetes patients will not be discovered.[9,14] The best screening test for gestational diabetes is the measurement of plasma glucose 1 hour after ingesting 50 gram of glucose. It is not necessary to follow any special diet before test.[15] The Carpenter and Coustan criteria cut offs were lower than the previously recommended National Diabetes Data Group(NDDG) values and resulted in higher prevalence of gestational diabetes mellitus. The prevalence of gestational diabetes mellitus on average is increased by 50% with the use of Carpenter and Coustan thresholds.[16]

In the present study positive screening value i.e. impaired glucose tolerance was found in four cases (4%). Gestational diabetes mellitus was found in only one case (1%). Low incidence of diabetes mellitus among the women coming for antenatal checkup in this hospital could be due to younger age group. Low incidence of diabetes mellitus in pregnancy in Nepal has also been reported in a study done in TUTH. In this study screening test value was positive i.e. impaired glucose tolerance in 3.67% and gestational diabetes mellitus was in 0.66% of total women of gestational age group 24-28 weeks(n=300). Similarly in a study performed by Shrestha A, Chawla CD among 1598 patients coming for antenatal checkup in Dhulikhel Hospital, Obstetric OPD also detected the incidence of gestational diabetes as 0.75%.[18] Regarding the sample structure related to gestational age 16.3% were of gestational age 24-25 weeks, 48.9% were of 26-27 weeks and 34.7% of 28 weeks. The impaired glucose tolerance test was seen in the gestational age group 24-25 weeks (50%) and 26-27 weeks (50%). So from these results impaired glucose tolerance were seen in early gestational age group as compared to late age groups. Out of 4 abnormal glucose challenge test two were of gestational age 24-25 weeks and two were 26-27 weeks. All of them had values more than 140 mg% but one who was diagnosed as GDM was of gestational age 24 weeks. In respect to parity, population structure consisted of nulliparous 53.1% and Para 1-4 of 46.9%. Among the nulliparous 26.9% of women were of 15-19 age groups, 38.4% were of 20-24 age groups, 34.6% were of 25-29 age group and none were from 30-35 age group.

Similarly among women with parity 1-4, 47.8% were of age group 20-24yrs, 30% were of age group 25-29 years and 21% were of age group 30-35 years and nil from age group 15-19 years. So there were no women with nulliparity in higher age group and highest number of age group was 20-24 and 25-29 years. Likewise in women with multiparity it was nil in youngest age group i.e. 15-19 years but not highest in older age group as expected. In contrary women with high parity were from age group 20-24 years. The incidence of impaired glucose tolerance among nulliparous was 0% and between para1-4 was 4%. So there was significant difference in impaired glucose tolerance among nulliparous and parity 1-4. Among the parity 1-4 impaired glucose tolerance was positive among the women with higher parity as was nil in lower parity. Observing the sample structure of study group, age group 15-19 years were 14.2%, 20-24 years were 42.8%, 25-29 years were 32.6%, 30-34 years were 8.1%, and 35 years were 2%. So the bulk of the study sample was of age group 20-24 years. Most of the women with positive GCT belonged to the age group 30-34 and 35 years age group. There were 2 cases positive in age group 30-34 years and 2 cases in 35 years age group. The only one diagnosed case of GDM was of age 32 years which belonged to the age group of 30-32 years. There was significant correlation between the age group and higher values of GCT. Emmanuel Odar, Julius Wandabwa and Paul Kiondo studied ninety mothers to determine the maternal and fetal outcomes in mothers with gestational diabetes mellitus attending antenatal clinics in Mulago Hospital Kampala Uganda. The study was done among women of gestational age between 24-32 weeks from April to September 2001. The age group at risk of getting gestational diabetes mellitus in this study was between 20-39 years being 96.8% of cases.[19] These results can be compared with the present study. In the present study out of 4 cases of impaired glucose tolerance, 50% belonged to the age group 30-34 years and 50% of cases belonged to the age group 35 years, out of which one had gestational diabetes. There were total of 34 obese women and among them 4(4%) women had BMI>30. Out of the other 30 women none of them had abnormal glucose challenge test values. Out of the four women who were obese two were having abnormal glucose challenge test values but the remaining two patients with abnormal GCT were having normal BMI. However, there was no significant correlation with the BMI and abnormal GCT values.

LIMITATION

Due to the smaller sample size the sensitivity of test was very low.

CONCLUSION

The incidence of impaired glucose tolerance and gestational diabetes in our study population was very low i.e. 4.1% and 1% respectively, since the sample size was very small the result may not be the same for larger population. Hence we can conclude that GCT is a good screening test for gestational diabetes when performed in a larger population.

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ORIGINAL ARTICLE

The Impact of Systemic Inflammatory Response Syndrome (SIRS) and Sepsis Training on Pediatric Nurses

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ABSTRACT

Introduction: Research demonstrates the importance of key interventions in reducing mortality rates of pediatric patients with sepsis. Of health care practitioners, nurses typically spend the most time with patients, and they must be knowledgeable in recognizing the SIRS and sepsis while also being aware of the importance of prompt intervention. **Aims:** The purpose of this study is to assess the knowledge of pediatric nurses of SIRS and reassess their knowledge after a sepsis training program. **Methods:** This time-series design study from February 2017 to February 2019 included 24 nursing staff involved in taking care of pediatric patients. The nurses were divided into two groups and they underwent a one-day training on sepsis. They were the evaluated periodically on their knowledge on pediatric sepsis at four different time points. The retention of knowledge was calculated based on the change in scores, as per mean numeric scores, immediately after the training compared to 12 and 24 months after the training. **Results**: In the thematic area 'Early recognition of signs/symptoms of SIRS' and 'Assessment of application of knowledge', there was a significant change (<0.001) from baseline in the mean scores once the nurses underwent training. The KAP assessment revealed a low total score of 14.5 out of 25 prior to the SIRS/Sepsis training There was a significant change (<0.001) in the mean knowledge score after the one-day training, 14.5 compared to 22.3, and the knowledge was retained 12 months after the training 19.2, whereas after 24 months post-training was 15.9. **Conclusion**: There is an urgent need to train and constantly re-train our nursing staff to ensure their ability of to accurately and efficiently recognize sepsis and hence help prevent pediatric morbidity and mortality.

***Keywords*:** Knowledge, Pediatric Nurses, SIRS, Sepsis

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INTRODUCTION

Sepsis among pediatric patients is often associated with multi-organ dysfunction from dysregulated systemic host immune response to infection[1] and can yield high rates of mortality and morbidity. The resolution on sepsis by the United Nations World Health Assembly 2017 recognizes sepsis as a global threat in children and is a priority for the World Health Organization to address during the next decade.[2,3] Despite the declining trend of pediatric severe sepsis and septic shock case-fatality rates (CFRs), the disparity between developing and developed countries persists.[4,5] Evidence suggests that early diagnosis, the timely initiation of appropriate antibiotics, and resuscitation to hemodynamic goals improve clinical outcomes.[6] Hospitals have been slow to adopt the recommended protocols because of implementation challenges, financial concerns, and hierarchical systems of care. The Surviving Sepsis Campaign (SSC) 2002 guidelines consist of time-sensitive therapeutic interventions, divided into two major bundles, namely fluid resuscitation and vasopressor usage.[7] Of health care practitioners, nurses spend the most time with patients, and they must be knowledgeable in recognizing SIRS and sepsis while also being aware of the importance of prompt intervention. Even though severe sepsis requires treatment in the Intensive Care Unit (ICU), the assessment of sepsis is not solely the domain of physicians, critical care nurses or Emergency Department (ED) nurses. Improving outcomes in patients with sepsis depends on every nurse involved in their care.[8] The aim of this study is to help identify and evaluate the impact of a multi-faceted training on SIRS/Sepsis on change and retention of knowledge in pediatric nurses.

METHODS

We conducted this study in Kathmandu Medical College and

Teaching Hospital (KMCTH), Sinamangal, Kathmandu, Nepal from February 2017 to February 2019. The study received approval from the Hospital's Institutional Review Committee (Ref. No. 17032017). The aim of this study is to help identify and evaluate the impact of a multi-faceted training on SIRS/ Sepsis on change and retention of knowledge in pediatric nurses. Using a convenience and purposive sampling method 24 nursing staff involved in taking care of pediatric patients at the bedside, namely pediatric ward nurses, Neonatal Intensive Care Unit (NICU), Pediatric Intensive Care Unit (PICU) nurses and ED nurses were included in the study. Participants were briefed about the purpose of the study and participation was voluntary. Informed written consent was obtained from each nurse participating in the study. We conducted a preliminary Knowledge, Attitude and Practice (KAP) survey on sepsis amongst these nursing staffs of KMCTH. For the KAP, a questionnaire with 25 multiple-choice questions, partially adapted from a tool developed to measure nurses' knowledge of SIRS/sepsis[9], was used to assess the knowledge of nurses on the current sepsis protocol. The pediatricians involved in designing the tool included clinicians involved in pediatric critical care, educators and researchers. This ensured provision of content and face validity to the study tool.

This time-series design study included 24 pediatric nurses and they were evaluated periodically on their knowledge on pediatric sepsis at four different time points (Table I). Participants completed an original questionnaire with questions that focused on early recognition of signs/symptoms indicating that a child is experiencing SIRS/Sepsis, ability to triage a septic child, assessment of application of knowledge (e.g.: Starting fluid resuscitation, sending appropriate laboratory tests, Starting early IV antibiotics) and counselling of parents.

Thematic Area	Tools	Evaluation Design
Early recognition of signs/symptoms of SIRS	10 multiple choice questions	Before training, immediately after training, 12 months and 24 months after training
Ability to triage a septic child	5 multiple choice questions	Before training, immediately after training and 12 months and 24 months after training
Assessment of application of knowledge	5 multiple choice questions	Before training, immediately after training and 12 months and 24 months after training
Counselling of parents	5 multiple choice questions	Before training, immediately after training and 12 months and 24 months after training
Group Work	Problem Solving	Immediately after training

Table I: Evaluation of Sepsis Knowledge on Pediatric Patients.

A one-day training was designed and the nurses were divided into two different groups according to their work obligations. The training took place in two consecutive days, the 24th and 25th of February 2017. The first day had 11 nurses, whereas the second day had 13. The nurses underwent lecture sessions by critical care experts from USA through live video conference, lectures by pediatric faculty and group work (Table II). The nurses re-took the test immediately after being trained and after 12 and 24 months of the training (February 2018, February 2019). We thus wanted to see the impact of SIRS and sepsis training on the knowledge of pediatric nurses and the long-term retention of knowledge.

The mean number of correct responses in the pretest and posttest will be analyzed. The retention of knowledge was calculated based on the change in scores, as per mean numeric scores, immediately after the training compared to 12 and 24 months after the training.

Topic	Training Methodology	Facilitator	Time Allotted (in minutes)
Sepsis: "Sepsis kills": early intervention saves lives	Lecture & Discussion	Head of Nepal Sepsis Foundation	30
Role of nurses in reducing the mortality and morbidity	Lecture	Professor of Pediatrics	15
Basis of septic shock	Lecture	Associate Professor, Pediatrics	15
Emergency care responsibility	Video Conference	Sepsis Expert,....., USA	30
Critical care responsibility	Video Conference	Emergency Emdicine Expert, ..., USA	30
Diagnosis of sepsis	Lecture	Lecturer, Pediatrics	15
Fluid resuscitation	Lecture	Lecturer, Pediatrics	15
Use of antibiotics	Lecture	Assistant Professor, Pediatrics	15
Collecting specimens for investigations	Lecture	Lecturer, Pediatrics	15
Counseling a parent for the need of early appropriate	Lecture	Lecturer, Pediatrics	15
Example cases and their management (3 separate groups)	Group Work	Facilitators (4)	30

Table II: One-Day Training Design.

RESULTS

All 24 nurses included in this study participated in knowledge evaluation before the training, immediately after training and at 12 and 24 months after the training. 4 of the nursing staff had left the institution during the course of the study and completed the post-training survey via email. The respondents comprised of all females, and they varied widely in their number of years of experience. The median age of the nursing staff was 28.6 and the median years of job experience was 6.4. The majority (75%) listed Bachelor of Science (BSc) in Nursing as their highest degree.

The characteristics of participants are presented in Table III.

Variables		Total (n) - 24
Age	21-30	16
	31-40	8
Education	Proficiency Certificate Level (PCL) in Nursing	6
	Bachelor's (BSc) Nursing	13
	PCL and BSc Nursing	5
Years of Job Experience	0-2	4
	3-5	7
	6-10	11
	>10	2

Table III: Characteristics of Participants..

The KAP assessment revealed a low total score of 14.5 out of 25 prior to the SIRS/Sepsis training There was a significant change (<0.001) in the mean knowledge score after the one-day training, 14.5 compared to 22.3, and the knowledge was retained 12 months after the training 19.2, whereas after 24 months post-training was 15.9 (Table IV). In the thematic area 'Early recognition of signs/symptoms of SIRS' and 'Assessment of application of knowledge', there was a significant change (<0.001) from baseline in the mean scores once the nurses underwent training. In spite of an average of 6.4 years of job experience, there was a significant gap in knowledge in rapid recognition of clinical symptoms. 99% of the nurses workers were competent immediately after the training ($p < 0.001$); however they failed to remain so after a year, and more so after 2 years after the training.

Thematic Area	Mean Score before the Training (n=24)	Mean Score After the Training (n=24)	Mean Score 12 Months Post-Training (n=24)	Mean Score 24 Months Post-Training (n=24)
Early recognition of signs/ symptoms of SIRS (10)	4.2	9.2	7.4	6.1
Ability to triage a septic child (5)	3.6	4.4	4.2	2.8
Assessment of application of knowledge (5)	2.7	3.9	3.2	2.9
Counselling of parents (5)	4.0	4.8	4.4	4.1
Total (25)	14.5	22.3	19.2	15.9

Table IV: Changes in SIRS/Sepsis Knowledge Acquired.

DISCUSSION

Although a vast amount of information regarding pathophysiology and management of sepsis in children is available in medical literature, the ability of clinicians to accurately and efficiently recognize sepsis, especially in its earlier stages, remains relatively undetermined.[10] Similar previous studies have surveyed physicians'[10, 11] and nurses [9,12] knowledge in recognizing sepsis. In the study done by Jeffrey et al, their findings demonstrated a significant knowledge deficit among participants in several key areas of SIRS/sepsis recognition. In the 242 pediatric nurses they surveyed it was demonstrated that nurses easily recognize septic shock but had difficulty recognizing patients in earlier stages of the sepsis continuum. They also found that significant confusion was evident regarding the role of blood pressure and serum lactic acid levels in diagnosing sepsis. Lactic acid being a key indicator of tissue perfusion should be determined in the initial resuscitation phase of severe sepsis and should be a valuable laboratory result in recognizing and managing sepsis.[6] It is further added that many nurses also did not realize a normotensive patient could be experiencing severe sepsis. The studies surveying physicians noted similar findings. As a result of the small amount of literature available on the topic of nursing knowledge/recognition of SIRS/sepsis, this study sought to find the knowledge gap in our hospital context.

We applied a one-day training to improve the knowledge and skills on rapid recognition and early initiation of SIRS and sepsis in pediatric nurses of our hospital. Our study demonstrated lack of awareness of some of the major key indicators of early recognition of signs/symptoms of SIRS, the ability to triage a septic child and the skill to counsel their parents. There was a huge knowledge gap even in presumably universally accepted facts of danger vital signs and cut-offs for blood pressure readings in the pediatric age group. However, a short one day training seems inadequate to sustain clinical competency over the years. Our study also emphasized how there is a need for constant re-inforcement of training of pediatric nurses, as their knowledge significantly wears off after a year or 2 of training. Refresher courses and review meetings are a must to help retention the this knowledge and their application on a daily basis in the management of SIRS/sepsis pediatric cases.

LIMITATIONS

With nurses from only one organization participating in the study, there is the possibility that the results are not representative of the national knowledge and practice of pediatric sepsis. There may be some discrepancy between actual practice and what was recorded as the results of this study depended on whether these forms were completed fully and correctly by the participants. Also, this being a time-series design study and with questions being multidimensional measuring various aspects of SIRS/sepsis, the effectiveness of each individual component of sepsis diagnosis and treatment cannot be accurately evaluated.

CONCLUSION

In spite of sepsis being one of the leading causes of death in childhood, no evaluation has been undertaken to assess the

competency of pediatric nurses in addressing these cases. There is an urgent need to train and constantly re-train our nursing staff to ensure their ability of to accurately and efficiently recognize sepsis and hence help prevent pediatric morbidity and mortality.

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ORIGINAL ARTICLE

Prevalence of Periodontitis among the People with Diabetes Mellitus

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ABSTRACT

Introduction: Diabetes mellitus is a metabolic disorder characterized by a chronic high level of blood sugar with disturbances in carbohydrate, fat, and protein metabolism resulting from defects in insulin secretion, action or both. Periodontitis is a chronic infectious disease which leads to the destruction of the periodontal ligament fibers and alveolar bone until tooth loss. Among the several factors that may manifest periodontitis like aging, genetic factors, poor oral hygiene, obesity and virulence of the attacking micro-organisms, type 2 diabetes mellitus has received the greatest attention. **Aims**: The aim of the study was to determine the association type 2 diabetes mellitus with periodontal condition among population in mid-western region of Nepal. **Methods:** We screened 200 subjects of age group from 30 to 50 years and divided into two groups: Group I – diabetic person and Group II were non diabetic. Oral examination was done to get the Community Periodontal Index of Treatment Need score and correlation between Diabetes mellitus and periodontal disease was determined. **Results:** Our result showed strong correlation between diabetes mellitus and periodontitis. When the evaluation was done for prevalence of periodontal disease according to diabetes mellitus, the prevalence of periodontal disease was significantly higher in diabetic person compared to non-diabetic individuals (88% vs 74.4%, *P*=0.03). [Odds Ratio = 11.826 and 95% confidence interval: 5.415-21.828] **Conclusion**: Provided Diabetes mellitus related morbidity and mortality is burgeoning in our society and it is imperative to identify right indicators of periodontal disease for specific population.

Keywords: Diabetes mellitus, Gingivitis, Periodontitis

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INTRODUCTION

Diabetes is one of the most common non-communicable diseases globally. Based on the current trends, >360 million individuals it has been estimated that will have diabetes by the year 2030.[1] Besides being a risk factor for cardiovascular disease, certain cancers, type 2 diabetes mellitus has also been associated with oral diseases, including periodontitis.[2] Periodontal disease has been reported as the sixth complication of diabetes, along with neuropathy, nephropathy, retinopathy, and micro- and macrovascular diseases.[3] Destruction of the peri- tooth structure that supports the teeth is referred as periodontal disease. The chronic destruction of these structures such as the gingiva, the periodontal ligament, the cementum, and the alveolar bone can lead to the partial or complete loss of teeth.[4] According to the WHO Global Oral Data Bank more than two-thirds of the world's population suffers from one of the chronic forms of periodontal disease.[5] Among many predisposing factor of periodontitis such as age, hygiene, gender, obesity, genetics, smoking, socio-economic status diabetes has also significant impact.[6] In fact the burgeoning prevalence of periodontitis despite improvement in public awareness about oral hygiene and accessibility to dental care providers also indicates that the changing lifestyle and obesity is significantly associated with periodontitis. Age is one important factor for the periodontal disease and its severity increases with age.[7,8] Diabetes contributes to an overall systemic inflammatory state through its effect on metabolic and immune parameters, thereby increasing susceptibility to periodontal disease.[9]Recent studies show that incidence of diabetes is increasing even in the developing countries like Nepal.[10]

METHODS

This study was conducted in patients attending Dental OPD at Nepalgunj Medical College, from December 2018 to July 2019. The study aimed to determine the correlation between diabetes mellitus and periodontitis measured by the Community Periodontal Index of Treatment Need CPITN index score 3 and 4. It was planned to establish if chronic periodontitis is associated with DM individuals attending dental outpatient department (OPD) of Nepalgunj Medical College, Nepalgunj Total 200 subjects of age group between 30 – 50 years of either sex were taken and divided into 2 groups.

- Group I – Diabetic – 100 subjects – study group
- Group II – Non- diabetic – 100 subjects – control group

Inclusion Criteria

Subjects who gave the consent to participate in this study, patients diagnosed with type 2diabetes (only for study group) were included for the study,

Exclusion Criteria

Subjects who were not in the age group 30–50 years and those individuals who were under medication of any kind of severe illness which might modify the state of periodontitis, smokers, tobacco chewers, pregnancy were excluded from the study. Subjects were asked to test fasting blood sugar level.

Oral examination was done with a sterile periodontal probe and dental mirrors. The mouth was divided into six parts (sextants). The score was identified by examination of specified index teeth: upper right first molar, upper right central incisor, upper left first molar, lower right first molar, lower left central incisor, lower left first molar and the highest score was recorded for each sextant. Community Periodontal Index of Treatment Needs (CPITN) (WHO / FDI in 1982) & scored as: 0= No disease; 1= Bleeding on probing; 2= Calculus with plaque seen or felt by probing; 3= Pathological pocket 4 – 5 mm; 4 =Pathological pocket 6 mm or more; x = When only 1 tooth or no tooth are present. In our study, subjects with CPITN 1 and 2 scores were identified as having gingivitis and the subjects with CPITN 3 and 4 scores were identified as having periodontitis. Data were analyzed with statistical software IBM SPSS Statistics 16.

RESULTS

Distribution of subject according to gender	Male	Female
Case (Group I)	72 (72 %)	28 (28 %)
Control (Group II)	70 (70%)	30 (30%)
Total (out of 200)	**142 (71%)**	**58 (29%)**

Table I: Distribution of subject according to gender.

The age range of population studied was 30 to 55 years with mean age 38.63±4.58 years. Among the 200 people examined, in Group I there were 72 males and 28 females and in Group II 70 males and 30 females. The overall male to female ratio was 2.44:1.

CPITN	GROUP I	GROUP II
1	0%	8%
2	8%	78%
3	66%	12 %
4	26%	2%
TOTAL	**100 %**	**100%**

Table II: Prevalence of CPITN.

The prevalence of CPITN 4 was found to be 26% in Group I & 2% in Group II [Table II]. This prevalence rates were found to be significantly different between case and control group (X^2 = 23.92, p< 0.01). odds ratio 17.21(CI: 3.96-74.84) [Table II] The prevalence of CPITN 3 was found to be 66% in Group I and 12% in Group II [Table II] and was significantly different between case and control group (X^2 = 61.28, p< 0.01). odds ratio 14.23 (CI: 6.85-29.58) The prevalence of CPITN 2 was found to be 8% in Group I and 78% in Group II [Table II] and was significantly different between case and control group (X^2 = 99.59, p<< 0.01). odds ratio was found to be < 1 implying that the odds of gingival bleeding in Group II was actually higher as compared to Group I {0.025 (CI: 0.01-0.05)}.

DISCUSSION

The relationship between diabetes mellitus and periodontal disease appears to be strong.[11] Diabetic person with poor metabolic control have a higher prevalence of periodontal destruction in severe form.[12] The main aim of this study was to describe the periodontal health status determined by CPI score and relate this to the glycemic profile among type 2 diabetics.[13] The present study was done in group of patient in age group, 30- 55 years as shown in table I. This age group was considered because other systemic diseases are much more common with the older age group and the dental indices would be affected by aging in older individuals. A positive association between type 2 diabetes and chronic periodontitis has been found previously, with diabetes mellitus associated with severe forms of the disease.[14] In the present study the frequency and percentage for the severe gingivitis (CPITN score 2) was highest in Group II (78%) whereas in the Group I CPITN score 3 was highest (66%) as shown in the table II. A study in Pakistan (2015) among those aged 20–60 years found a similar prevalence of periodontitis of 34.5%, another in Bangladesh (1990) found a prevalence of 42%, while a study among urban residents of Brazil (2004) showed a prevalence of 79% of clinical attachment loss.[15,16,17] Studies done in developed countries such as the United States and Canada showed a prevalence of 47% and 67.8%, while a study in France among those aged

35–64 years showed a higher prevalence of 82.23%.[18,19,20] The prevalence of CPITN 4 was found to be highest (26%)in Group I & only 2% in Group II. This prevalence rates were found to be significantly different between case and control group (X^2 = 23.92, p< 0.01) with the odds ratio 17.21(CI: 3.96-74.84) as shown in table II.

The main mechanisms by which diabetes and periodontitis are related are via alterations in host responses and collagen metabolism. Due to prolonged exposure of tissue to hyperglycemia which may result in production of advanced glycation end products (AGEs). This leads to an increase in collagen cross-linking and the generation of free radicals.[4] The modified collagen fibers accumulate in the tissues, resulting in thickening of the basement membrane. This impairs oxygen diffusion, waste elimination, leukocyte migration and the diffusion of immune factors and may thereby contribute to the pathogenesis of periodontitis.[5] Significantly higher cytokine levels have been found in the gingival crevicular fluid of diabetics when compared with non-diabetics, with both groups demonstrating periodontitis.[4,5,6] Hyperglycemic conditions result in decreased cellular proliferation and growth of periodontal ligament (PDL) fibroblasts and collagen synthesis. Patients with diabetes have an increase in gingival crevicular fluid collagenase activity when compared with non-diabetics.[8] This greater collagenase activity would suggest an increased degree of collagen breakdown in the tissues of diabetics.

CONCLUSION

Thus, our study shows that persons with Diabetes Mellitus has higher percentage of CPITN score 3 and 4 and so are at high risk for periodontal diseases compared to persons with normal. Relevant blood sugar level can serve as excellent indicators of periodontitis if used based on scientific validation.

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