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CONTENTS

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Each of the following section should be in separate page:

1. Title page
2. Abstract (Structured)
3. Introduction
4. Materials and Methods
5. Results (With tables ar figures)
6. Discussion
7. Acknowledgement if a
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Editorial

Impact of Climate Change on Eye Health

***Siddiqi MH**

PAH Med Col J. Jul 2024; 1 (1): 1

Several serious eye diseases and health conditions can lead to permanent or some cases, these conditions can lead to blindness. Cataract, pterygium and OSSN are particularly associated with UV exposure. UV-B radiation, in particular, contributes to cataract formation[1]. Pterygium prevalence is linked to UV exposure and particulate matter, while OSSN is commonly observed in regions with high UV radiation, especially near the equator[2].

Global warming also impacts human health more broadly[3]. Warmer temperatures increase the risk of vector-borne diseases, such as malaria and viral infections like dengue fever[6]. In Bangladesh, climate change is expected to heighten vulnerability to cholera, dengue, cardiovascular and respiratory diseases and malnutrition due to reduced food production (ICDDRB)[5]. For example, in April 2014, severe heatwaves led to viral illnesses and gastrointestinal disorders. Climate change also affects mental health; vulnerable populations and those with pre-existing psychiatric conditions are particularly at risk[6]. Beyond health, Bangladesh may experience unpredictable weather patterns, seasonal irregularities and food and water insecurity due to global warming. Some cases, these conditions can lead to blindness. Cataract, pterygium and OSSN are particularly associated with UV exposure. UV-B radiation, in particular, contributes to cataract formation[4]. Pterygium prevalence is linked to UV exposure and particulate matter, while OSSN is commonly observed in regions with high UV radiation, especially near the equator.

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Original Article

Prevalence and Outcomes of Aspiration Pneumonia in Stroke Patients with Altered Consciousness Admittedina Medical College Hospital of Haor District of Bangladesh

***Alam MS[1], Sikandar A[2], Sultana T[3], Shaheen MMR[4]**

Abstract

Background*: Aspiration is a well-established cause of pulmonary disease and frequently occurs in patients with altered consciousness. Mortality from aspiration pneumonia ranges from approximately 1% in outpatient settings to as high as 25% in hospitalized patients. If not properly managed, mortality can reach up to 70%. Currently, there is no national-level study on aspiration pneumonia among hospitalized stroke patients with impaired consciousness.*

Objective*: This study aimed to determine the prevalence of aspiration pneumonia in stroke patients with altered consciousness admitted to the medicine department of President Abdul Hamid Medical College Hospital (PAHMCH).*

Methods and Materials*: A prospective observational study was conducted from May 2018 to March 2019, including 52 adult stroke patients with altered consciousness who developed aspiration pneumonia.*

Results*: Among them, 76.92% developed pneumonitis, 13.46% developed lung abscesses and 9.62% developed acute respiratory distress syndrome (ARDS). Radiologically, 33 patients had opacities in the right lower lung zone, 13 in the left lower zone, 6 in the right midzone and 10 patients had bilateral lower-zone opacities. The overall mortality rate was 23%. Mortality was 8.33% when only one lobe was involved, whereas involvement of two or more lobes on one or both sides was associated with mortality rangingfrom 25% to91%.*

Conclusions*: Physicians and healthcare personnel can reduce the incidence of aspiration pneumonia by ensuring that comatose patients are not left unattended, checking nasogastric tube placement, positioning patients properly, administering tube feeds at an appropriaterate to allow gastric emptying and adhering to routine patient care precautions.*

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Keywords: *Aspiration pneumonia, Pulmonary involvement, Stroke with altered consciousness*

Introduction

Aspiration pneumonia was first identified as a distinct clinical condition in obstetric anesthesia by Mendelson in 1944[1]. Aspiration is widely recognized as a cause of pulmonary disease and, in many clinical situations, may be the leading contributor to pulmonary complications. Diagnosing aspiration pneumonia can be challenging, especially when aspiration episodes are small, as the resulting pulmonary response is often nonspecific and difficult to attribute directly to aspiration. Even in cases of massive aspiration leading to pneumonia, confirming the cause is difficult if the aspiration event was not observed[2]. Aspiration pneumonia occurs when lung parenchyma and bronchial tubes become inflamed due to the abnormal entry of fluids, particulate materials, endogenous secretions, or gastric contents into the lower respiratory tract[3]. Two main conditions are usually required for aspiration pneumonia to develop: impairment of protective mechanisms of the lower airways (including glottic closure, cough reflex and clearance mechanisms) and the presence of an injurious inoculum, which may trigger an inflammatory response, damage lung tissue, or obstruct airways when sufficient material is aspirated[3]. Aspiration

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can lead to chemical pneumonitis (Mendelson's syndrome), aspiration pneumonia, necrotizing pneumonia, lung abscess, empyema, lobar or segmental atelectasis and pleural effusion[4]. The pattern of pulmonary involvement in stroke patients depends on factors such as patient position, gravity, airflow dynamics and characteristics of the aspirate[5]. Recumbent patients typically have aspiration affecting the posterior segments of the upper lobes and apical segments of the lower lobes, whereas upright or semi-recumbent patients usually develop involvement in the basal segments of the lower lobes[6]. The outcome of aspiration pneumonia is influenced by the type and volume of aspirate, Comorbidities, nutritional status, primary lobe involvement, number of lobes affected, early diagnosis and appropriate management. Mortality and morbidity are closely linked to the number of lobes involved: single-lobe involvement mayresult in morbidity and mortality up to 41.0%, while multi-lobe involvement can increase this risk up to 90.0%[7]. Therefore, careful management of patients with altered consciousness is critical to reduce morbidity and mortality from aspiration pneumonia. Preventive strategies for stroke patients with impaired consciousness include: a) Elevating the head of the patient to a 30° angle to reduce aspiration risk, b)Using nasogastric feeding for at-risk patients, c) Maintaining patients in a lateral position, d) Feeding in a semi-recumbent position and keeping the patient in the same posture for at least 20 minutes post-feeding and e) Performing regular oropharyngeal suction and maintaining proper oral hygiene.

Globally, aspiration pneumonia is recognized as a common disease, though recent statistics are limited. The morbidity and mortality largely depend on the pulmonary involvement pattern. In Bangladesh, no studies have investigated the pattern of pulmonary involvement or outcomes in hospitalized stroke patients with aspiration pneumonia. This study aims to fill that gap, providing baseline information for future research and clinical reference.

Methods

This prospective observational study was conducted in the Department of Medicine at President Abdul Hamid Medical College Hospital, Kishoreganj, from June 2020 to December 2013. A total of 52 adult stroke patients with altered consciousness and aspiration pneumonia admitted to the medicine ward were enrolled. Informed written consent was obtained from the patients' attendants after a thorough explanation of the condition. Patients were evaluated through detailed history-taking and physical examination usinga structured case record form (CRF) completed by the study physician. Altered consciousness was assessed using the Glasgow Coma Scale. All patients underwent hematologic investigations, including total leukocyte count (TLC), platelet count, chest X-ray, blood urea, creatinine, random blood sugar, sputum Gram staining and blood culture. Categorical data were expressed as frequencies and percentages, while continuous variables were presented as means and standard deviations. Data were processed and analyzedboth manually and using SPSS version 16.0 for Windows.

Results

This prospectively conducted study included 52 stroke patients with altered consciousness complicated by aspiration pneumonia. The mean age was 57.42±13.63 years, with a range of 25 to 90 years (Table I). Among the participants, 37(71.15%) were male and 15(28.85%) were female. Following aspiration, 76.92% of patients developed pneumonitis, 13.46% developed lung abscesses and 9.62% developed acute respiratory distress syndrome (ARDS). Radiologically, 33 patients showed opacity in the right lower lobe, 13 in the left lower lobe and 6 in the right midzone. Ten patients had opacities in both lower lobes. The overall mortality rate in this study was 23.0%. Mortality was 8.33% when only a single lobe was involved, whereas involvement of two or more lobes on one or both sides was associated with mortality ranging from 25.0% to 91.0%.

Table I: Age distribution of the study patients

Age in years	Number of patients (n)	Percentage (%)
25-40	06	11.54
41-50	10	19.23

51-60	17	32.69	71-80	04	07.69
61-70	13	25.00			

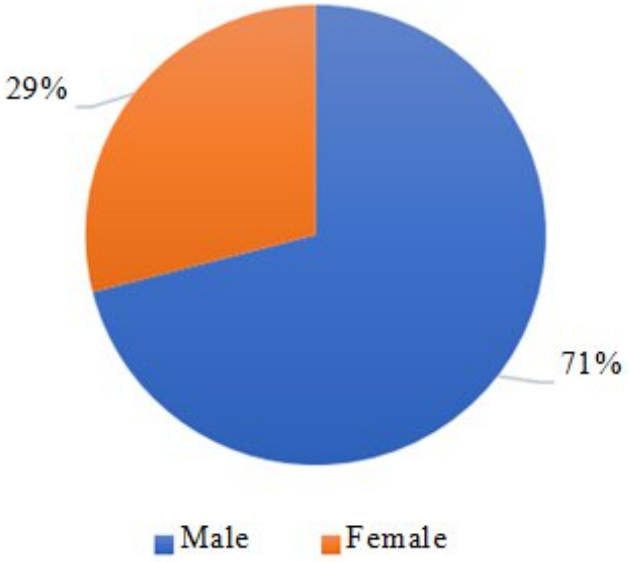

Figure 1: Distribution of patients according to sex

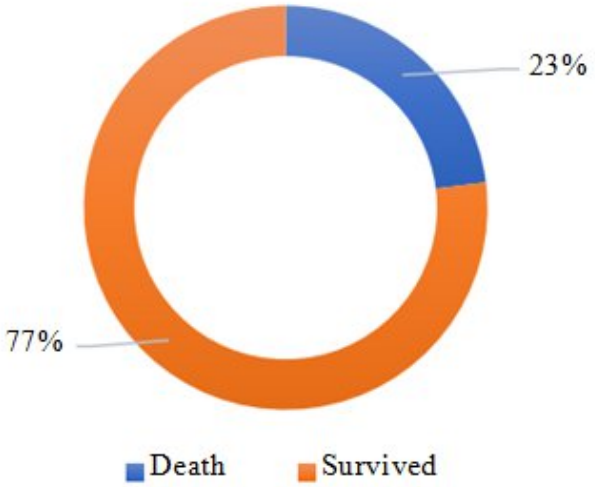

Figure 2: Distribution of outcomes of aspiration pneumonia among the study patients

Table II: Clinical features of aspiration pneumonia among the study patients

Clinical feature	Number of patients (n)	Percentage (%)
Fever	52	100.0
Cough	52	100.0
Respiratory distress	52	100.0

Vomiting	23	44.23
Chest pain	25	50.00

Table III: Frequency of pulmonary manifestations of aspiration pneumonia

Pulmonary manifestations	Number of patients (n)	Percentage (%)
Pneumonia	40	76.92
Lung abscess	07	13.46
ARDS	05	09.62

Table IV: Primary zone involvement radiologically

	Number of patients (%)
Right lung	
Upper zone	00 (00.00)
Middle zone	06 (11.54)
Lower zone	33 (63.46)
Left lung	
Upper zone	00 (00.00)
Lingula	00 (00.00)
Lower zone	13 (25.00)
Both lungs	
Upper zone	00 (00.00)
Middle zone/Lingula	00 (00.00)
Lower zone	10 (19.23)

Table V: Distribution of the study patients according to given antibiotics

Given antibiotics	Number of patients (n)	Percentage (%)
Amoxicillin & Clavulanic Acid	35	67.30
Ceftriaxone	12	23.10
Meropenem	05	09.60
Metronidazole	52	100.0

Table VI: Extent of pulmonary manifestations as related to mortality

Pulmonary manifestations	Mortality	
	Number of patients (n)	Percentage (%)
Pneumonia	05	09.61
Lung abscess	03	05.76
ARDS	04	07.69

Table VII: Extent of pulmonary involvement radio logically and mortality

Pulmonary manifestations	Mortality

	Number of patients (n)	Percentage (%)
Right lower zone	01	08.33
Right, middle and lower zone	03	25.00
Both lower zones	08	66.67

Discussion

In this small series of stroke patients with altered consciousness complicated by aspiration pneumonia at a district-level hospital, the mean age was 57.42±13.63 years, ranging from 25 to 90 years. The majority of patients (32.69%) were aged 51-60 years. In comparison, El-Solh reported a higher mean age of 80.2±6.5 years in their cohort[8]. Males predominated in our study, comprising 71.15% (n=37) of patients, while females accounted for 28.85% (n=15); similarly, El-Solh reported 43 males and 26 females among 69 patients[8]. All patients in our study had altered consciousness, with Glasgow Coma Scale scores ranging from 7 to 12. Fever, cough and respiratory distress were the most common clinical findings, with a few patients exhibiting chest pain or vomiting. Physical examination frequently revealed tachypnea, hypoxia, crepitations and rhonchi, while hypotension and cyanosis were less common. Bynum and Pierce also reported fever and cough in approximately one-third of their patients[9]. Following aspiration, 40 patients (76.92%) developed pneumonitis, 7(13.46%) developed lung abscesses and 5(9.62%) developed acute respiratory distress syndrome (ARDS). These findings are comparable to Itzhak and Finegold, who reported 70.3% pneumonitis, 16.2% necrotizing pneumonia and 13.5% lung abscess[10]. Radiologically, the right lower zone was most frequently involved (n=33, 63.46%), followed by the left lower zone (n=13, 25.0%) and the right middle zone (n=6, 11.54%). Ten patients (19.23%) had opacities in both lower zones. These results align with previous studies, including Cameron, who observed predominant involvement of the right lower zone and Itzhak and Finegold, who reported right and left lower zone involvement in 34 and 33 patients, respectively[2,10]. Youngberg also noted that aspiration often causes diffuse or unilateral lung opacities[11]. Most patients received intravenous amoxicillin-clavulanate or ceftriaxone, with metronidazole added for anaerobic coverage. Forty patients (77.0%) improved following management. Patients who developed ARDS were transferred to tertiary care centers for mechanical ventilation and meropenem therapy; however, many died, likely due to underlying comorbidities compounded by aspiration. Mortality in previous studies has varied widely: Awe et al. reported 70.0%, Dines et al. 55.0% and El-Solh and Pietrantoni 36.0%, with 64.0% showing improvement[8,12,13]. In this cohort, mortality was closely related to the number of lobes involved. If only one lobe was affected, mortality was 8.33%, whereas involvement of two or more lobes on one or both sides was associated with mortality ranging from 25.0% to 91.0%. Thesefindings highlight that aspiration pneumonia in stroke patients with altered consciousness carries significant morbidity and mortality, particularly with multi-lobar involvement, manifesting with respiratory distress, tachypnea, diffuse rales and hypoxemia.

Conclusion

This prospective observational study examined aspiration pneumonia in hospitalized stroke patients with impaired consciousness. The severity and pattern of pulmonary involvement depend on patient position, gravity, airflow dynamics and the characteristicsof aspirated material. Radiological infiltrates may be diffuse, localized, unilateral, or bilateral and no specific imaging feature can definitively rule out aspiration. However, in an appropriate clinical context, a wide range of radiological abnormalities should raise suspicion for aspiration pneumonia. The outcome is influenced by the type and quantity of aspirates, comorbidities, nutritional status, lobe involvement, timely diagnosis and adequacy of care. Importantly, aspiration pneumonia is largely preventable and manageable with prompt and appropriate interventions. Physicians and healthcare personnel can minimize its incidence by ensuring that comatose patients are not left unattended, nasogastric tubes function correctly and patients are positioned carefully during feeding and care.

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Original Article

Pattern of Admission and Related Outcomes in the Neonatal Care Unit of a Tertiary Care Hospital, Kishoreganj

***Akter AHMM[1], Ali MA[2], Khatun S[3], Rahman M[4], Nuruzzaman M[5], Das K[6], Rabeya T[7], Bari MA[8], Ahammad AN[9]**

Abstract

Background*: The neonatal period is a critical phase for a child's survival, with neonatal deaths accounting for approximately half of all under-five mortalities in developing countries. Disease patterns among neonates can vary across regions and over time.*

Objective*: This study analyzing these patterns in healthcare settings helps identify gaps in care and strategies to reduce neonatal morbidity and mortality.*

Methods and Materials*: This hospital-based retrospective study assessed admission patterns and outcomes in the neonatal care unit of President Abdul Hamid Medical College Hospital, Kishoreganj, reviewing medical records from March 2022 to February 2023. Data from all admitted neonates were analyzed for sex, birth weight, gestational age, place and mode of delivery, reasons for admission, outcomes and causes of death.*

Results*: Among Of the 408 neonates admitted, 249(61%) were male and 159(39%) were female, yielding a male-to-female ratio of 1.5:1. Inborn neonates accounted for 190 cases (46.6%), while 218(53.4%) were referred from other facilities. The leading causes of admission were birth asphyxia (35.2%) and prematurity (32.4%), followed by meconium aspiration (14.7%) and sepsis (9.8%). Among the admitted neonates, 250 (61.3%) improved and were discharged home, 35 (8.6%) left against medical advice, 34 (8.3%) werereferred to other institutions and 89 (21.8%) died. Prematurity with low birth weight was the primary cause of mortality (35.9%), followed by sepsis (30.4%) and perinatal asphyxia (24.7%), resulting in an overall mortality rate of 21.8%.*

Conclusions*: Strengthening antenatal care and ensuring prompt neonatal resuscitation at the community and delivery room levels are essential strategies to reduce neonatal mortality and improve survival outcomes.*

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Keywords: *Low birth weight, Morbidity, Mortality, Perinatal asphyxia, Prematurity*

Introduction

The neonatal period, defined as the first 28 days of life, is the most critical phase for a child's survival, with the risk of death during the initial days being 500 times higher than at one month of age[1,2,3,4,5]. Although neonatal mortality rates are gradually declining, significant disparities remain between developed and developing countries and reductions in neonatal mortality have over the past 50 years, since independence, Bangladesh has achieved remarkable progress in health indicators. UNICEF has recognized the country's notable success in reducing under-five mortality. Under Sustainable Development Goal 3 (SDG 3), Bangladesh is tasked with reducing neonatal mortality to 12 per 1,000 live births by 2030. In developing countries, the leading causes of neonatal morbidity and mortality

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include prematurity, sepsis, birth asphyxia, jaundice and pneumonia-many of which are preventable through appropriate antenatal care, early diagnosis and timely treatment[6]. Causes of neonatal illness and death can vary across regions and over time, even within the same location[7]. It has been estimated that effective implementation of proven interventions with full coverage could reduce neonatal deaths by up to 70.0%[8]. Regular assessment of disease patterns and outcomes at healthcare facilities is essential for guiding policymakers indesigning strategies to improve care quality. In light of this, the present study aimed to evaluate the patterns of neonatal disease and the outcomes following admission and management in the Neonatal Intensive Care Unit (NICU) of a tertiary care hospital in Kishoreganj.

Methods

This retrospective observational study was carried out in the neonatal care unit of the Department of Pediatrics at President Abdul Hamid Medical College and Hospital, Kishoreganj. The NICU, operational for the past five years, provides 24-hour services for both inborn and out bornneonates and is equipped with resuscitation facilities, incubators, radiant warmers, phototherapy units, Continuous Positive Airway Pressure (CPAP) machines and trained staff. Medical records of 408 neonates admitted between March 2022 and February 2023 were reviewed for this study. The variables analyzed included gestational age, birth weight, sex, mode and place of delivery, final diagnosis and outcomes, specifically whether the neonate improved and was discharged, left against medical advice, was referred to another facility, or died.

Results

During the study period, a total of 408 neonates were admitted. Among them, 249(61.0%) were male and 159(39.0%) were female, resulting in a male to- female ratio of 1.5:1. Of these, 190(46.6%) were inborn, while 218 (53.4%) were referred from other facilities for further management. Regarding the mode of delivery, 108(26.5%) neonates were born vaginally and 300(73.5%) were delivered via lower segment cesarean section. In terms of gestational age, 214(52.4%) were preterm (<37 completed weeks), 180(44.1%) were term (37-42 weeks) and 14(3.4%) were post-term (>42 weeks). Birth weight analysis revealed that 202 (49.5%) neonates were low birth weight (LBW, <2500 g), 193(47.3%) were appropriate for gestational age (AGA, 2500 - <4000 g) and 13(3.1%) were large for gestational age (LGA, >4000 g) as shown in Table I.

Table I: Socio-demographic distribution of neonates admitted to the NICU (n=408)

Characteristics	Number (n)	Percentage (%)
Place of delivery		
Inborn	190	46.6
Outborn	218	53.4
Gestational age		
Term	180	44.1
Preterm	214	52.4
Post-term	14	3.4
Gender		
Male	249	61.0
Female	159	39.0
Birth weight category		
Appropriate for gestational age	193	47.3
Low birth weight	202	49.5
Large for gestational age	13	03.1
Moge of delivery		
Normal vaginal delivery	108	26.5
Lower unterine cesarean section	300	73.5

The leading causes of admission were birth asphyxia (35.2%) and prematurity (32.4%), followed by meconium aspiration (14.7%) and sepsis (9.8%) as presented in Table II. Outcome analysis indicated that 250 neonates (61.3%) improved and were discharged home, 35(8.6%) were discharged on request, 34(8.3%) were referred to other institutions and 89(21.8%) died, as shown in Table III. Prematurity with LBW was the predominant cause of mortality (35.9%), followed by sepsis (30.4%) and perinatal asphyxia (24.7%), as illustrated in Table IV.

Table II: Outcomes of admitted neonates after management

Outecome	Number (n)	Percentage (%)
Dischaged	250	61.3
Left against medical advice (LAMA)	35	8.6
Referred to higher center	35	8.3
Death	89	21.4

Table III: Major causes of neonatal deaths (n=89)

Cause of death	Nubmer (n)	Percentage (%)
Prematurity with LBW	32	35.9
Sepsis	27	30.4
Perinatal asphyxia	22	24.7
Others	08	08.9

Discussion

As described, this retrospective observational study was conducted in the neonatal care unit of a tertiary care hospital in a semi-urban setting, including detailed data on 408 neonates. Consistent with findings from both developed and developing countries, male neonates 249(61.0%) and females 159(38.9%)[9,10,11]. Previous studies suggest that male infants are genetically and biologically more susceptible to various illnesses and premature death[12,13]. In addition, relatively more developed lungs in female neonates at birth may contribute to their survival advantage[14]. Cultural and social practices may also lead to preferential care of male newborns compared to females[15,16]. Analysis of birth weight indicated that nearly half of the neonates (49.3%) were low birth weight (LBW), while 47.0% were appropriate for gestational age and 3.1% were large for gestational age (LGA), consistent with several earlier studies. Overall, LBW remains one of the leading causes of neonatal admissions in developing countries[17]. Examination of medical records revealed that the most common indications for admission were perinatal asphyxia (35.2%) and prematurity with LBW (32.4%), followed by meconium aspiration syndrome (MAS, 14.7%) and neonatal sepsis (9.8%). These findings align with studies conducted by Elizabeth U. and Modupe O. Oyetunde in Ibadan, Nigeria (54.9%) and Rahim F et al. (53%)[18,19]. Perinatal asphyxia was the primary cause of admission in our NICU. A study from Tanzania reported asphyxia, prematurity and sepsis accounting for 26.8%, 18.4% and 15.4% of admissions, respectively[20]. In contrast, other studies in Nigeria and developing countries found neonatal sepsis to be the leading cause of morbidity, followed by birth asphyxia, jaundice and prematurity. Although patterns vary by center, the main reasons for admission in our NICU, similar to other developing country facilities, were asphyxia, prematurity and sepsis[10,21,22,23,24]. Proper antepartum, intrapartum and postpartum care can reduce morbidity, although irreversible damage, particularly to the brain caused by asphyxia, may not be preventable. Ensuring effective neonatal resuscitation at delivery is therefore critical. In this study, a majority of neonates (73.5%) were delivered via cesarean section. Although we did not analyze the correlation between cesarean delivery and neonatal outcomes, other studies have reported higher morbidity and mortality among infants delivered through emergency cesarean section[25]. Regarding outcomes, 250 neonates

(61.3%) improved and were discharged home, 35(8.6%) left against medical advice (LAMA), 34(8.3%) were referred to other NICUs and 89(21.8%) died. The primary causes of mortality were prematurity with LBW (35.9%), sepsis (30.4%) and perinatal asphyxia (24.7%), consistent with previous studies by Syed R. A. and Tekleab A. M[26,27]. While the causes of neonatal mortality are multifactorial, most deaths could be prevented through a multidisciplinary approach in tertiary care hospitals in semi-urban settings of Bangladesh.

Limitations

This study is a retrospective observational analysis conducted at a single center, with all data extracted from the NICU medical records of a tertiary care hospital. Being hospital-based, the findings may not fully represent the broader community. Furthermore, the outcomes of neonates who were referred to other facilities or discharged against medical advice remain unknown.

Conclusion

Prematurity with low birth weight, sepsis and perinatal asphyxia are the leading contributors to neonatal morbidity and mortality. Careful antenatal monitoring, effective neonatal resuscitation at delivery and timely management of preterm and LBW infantscan prevent most deaths. Therefore, policymakers in developing countries, including Bangladesh, should prioritize the establishment of adequate tertiary care facilities, such as neonatal intensive care units in rural and semi-urban areas, alongside long-term investments in health systems, community awareness, family planning and the empowerment of women.

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Original Article

Psychiatric Morbidity and Psychosocial Stressors among 16 To 18-year-old Students with Self-Harm in Two Colleges of Dhaka City

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Abstract

Background*: Self-harm is a complex and multidimensionally neglected public health problem, which poses a significant risk for 40-50% of people who commit suicide. Since this problem is common in Bangladesh, specifically among students, but there is a severe scarcity of data about its prevalence and pattern among them.*

Objective*: This study aimed to find out the prevalence of self-harm among 16 to 18-year-old students in Dhaka city and its relation to psychosocial stressors and psychiatric co-morbidities.*

Methods and Materials*: This cross-sectional study was conducted in the Department of Psychiatry, BSMMU, Dhaka. The sampling sites areas were St. Joseph Higher Secondary School and College and Mohammadpur Preparatory Girls' High School and College. All data were collected over the phone in two phases using the students' numbers with the college authorities' permission. In the first phase, the students were selected by random sampling from all sections throughout both colleges and they completed the self-reported harm inventory scale and the Dhaka stress scale for adolescents. In the second phase of the study, students with a history of self-harm were given the development and well-being assessment scale to assess their psychiatric co-morbidity. The mean, median, percentage and frequency were analyzed using SPSS version 24 and a paired t-test was done to measure the significance level.*

Results*: The study revealed that 15.87% of respondents had a history of deliberate self-harm, which was more common among female students (18.57%) in comparison to male students. The assessment scale for development and well-being determined that 70% of the students who had deliberated self-harm had at least one psychiatric illness. The most comorbid condition was GAD (34.0%). With the Dhaka Stress Scale for adolescents, it was found that 73.0% of students had severe stress levels. A significant difference in stress levels was observed when comparing deliberate self-harm with the non-self-harm group (p<0.0120. The present study also found that co-morbidities and psychiatric disorders are evident among those who commit self-harm.*

Conclusions*: This study emphasizes the importance of qualified student counselors in the colleges of Dhaka city and the urgent need for holistic educational institute-based mental health initiatives.*

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Keywords: *Mortality, Morbidity, Perinatal asphyxia, Prematurity, Low birth weight*

Introduction

Self-harm is a common clinical problem and this is raising alarm day by day among college students, who are primarily adolescents. Self-harm is sometimes hard to differentiate from suicidal attempts or ideation. Although these terms are sometimes used interchangeably, they differ in many ways, such as intent, method, frequency, cognition and aftermath. Self-harm may have the intent to cope rather than take one's life[1]. The number of self-harm acts is rising both in developed and developing countries. Due to the scarcity of reliable data on the true burden andprevalence of self-harm, its magnitude is often inferred from suicide statistics. Suicide was thesecond leading cause of death among individuals aged 15-29 years worldwide in 2012 and it is suggested that the incidence of self-harm is several times higher than that of completed suicide[2]. A recent community-based cross-sectional study among youths reported that fear arising from

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inadequate parental care and protection- leading to feelings of alienation from parents and the surrounding environment- was significantly associated with self-harm[3]. Self-harm, behaviors may further reflect underlying psychiatric comorbidities, such as mood disorders substance use disorders, personality Self-harm has been associated with multiple psychosocial stressors, including peer victimization, parental emotional neglect, childhood sexual abuse, insecure attachment, anxiety, depression, low self-esteem, body dissatisfaction, poor academic performance and substance use. Parenting style and family dysfunction have also been identified as significant risk factors for deliberate self-harm disorders and impulse control disorders[4]. Studies from developed countries indicate that self-harm is particularly prevalent among adolescents, with reported rates ranging from 6.0-8.0% to 12.0-20.0% among adolescents and young adults[5]. Self-harm is uncommon before puberty but increases markedly during adolescence, with the average age of onset reported to be approximately 16 years in the United States[6]. In the contemporary context, adolescents face increasing challenges in coping with intense stress related toacademic demands, family dynamics and peer relationships. Many youths experience overscheduling and heightened performance expectations imposed by parents and peers. Additionally, adolescents have become increasingly vulnerable to the pressures of a highly media-driven and psychologically demanding social environment, which may further exacerbate emotional distress and maladaptive coping behaviors such as self-harm. The adversities they face today are more likely to have an impact on their mental health.In Bangladesh, there is a lack of a comprehensive model that explains the association between self-harm and risk factors during the adolescent period. Exploring these factors would help healthcare professionals to predict the outcome of self-harm among college students. Considering all those stated before, this study aims to justify the existing data and add new information regarding the association of psychosocial stressors and psychiatric comorbidities in self-harm. It will further look into the stressorburden and how it varies between students with and without a history of self-harm and also variations of risk factors according to socio-demography. Exploring personal accounts of self-harm and associated risk factors can enhance health professionals' understanding of the sensitivities and complexities involved in obtaining information during clinical assessments and therapeutic interventions. The findings of this study may also raise awareness of the key risk factors contributing to self-harm among youngpeople, thereby supporting early identification and targeted prevention strategies.

Methods

Study design

The study was conducted in two phases. In the first phase, these colleges had students in the 11th and 12th grades (first and second year of college) and most were between 16 and 18 years old. In this phase, students were selected randomly from all sections throughout the entire college. The selected students were given both the self-harm inventory scale and the Dhaka stress scale for adolescents, which were self-answered. It took a maximum of 15 minutes for the students to complete the self-harm to generate DSM-5 psychiatric diagnoses for 2 to 18-year-olds. It is a validated and internationally well-accepted research instrument for assessing psychiatric disorders, developed by Goodman et al. Mullick and Goodman adopt and validate it.

Data processing and analysis

After collecting the data, it was checked for omissions, inconsistencies and improbabilities. The data were cleaned, coded and entered into the computer. According to the research objectives, data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 24.0.

Results

The researcher approached 65 students to participate in the study. However, two of them were unwilling to give consent. As a result, the study was conducted with 63 respondents, 35(55.6%) male and 28(44.4%) female; all of them were students and unmarried. The study revealed that 15.87% of respondents had a history of deliberate self-arm and the history of self-harm was more common among female students (18.57%) in comparison to male students (13.88%). The researcher attempted to find out the psychiatric disorders among these 10 students who had a history of deliberate self-harm using the valid Bengali DAWBA Scale and found that 70.0% of them had at least one psychiatric disorder. The different type of psychiatric disorders was assessed and it revealed general anxiety disorder was the most common comorbid

psychiatric disorder. The most comorbid conditions were GAD (34.0%), hyperactivity (17.0%) and OCD (17.0%), followed by troublesome behavior (8.0%), depression (8.0%), panic disorder (8.0%) and PSTD (8.0%) (Figure 1). The stress level of the students was assessed using the Dhaka Stress Scale. The study revealed there was a significant impact of stress on self-harm. Table I showed a significant difference ($p<0.05$) of stress level between Deliberate Self-Harm (DHS) andnon-self-harm group on paired t-test. To understand the impact of gender on stress,male and female participants were compared. The most common stressors in both deliberate self-harm and no self-harm groups were parental pressure for study, increased study pressure, unexpected results in the study, mobile phone addiction, death of close family members, conflict with parents, harassment-related problems, etc. The methods of self-harm among the participants were excessive use of medication, consumption of alcohol or drugs,and engaging in bullying relationships.

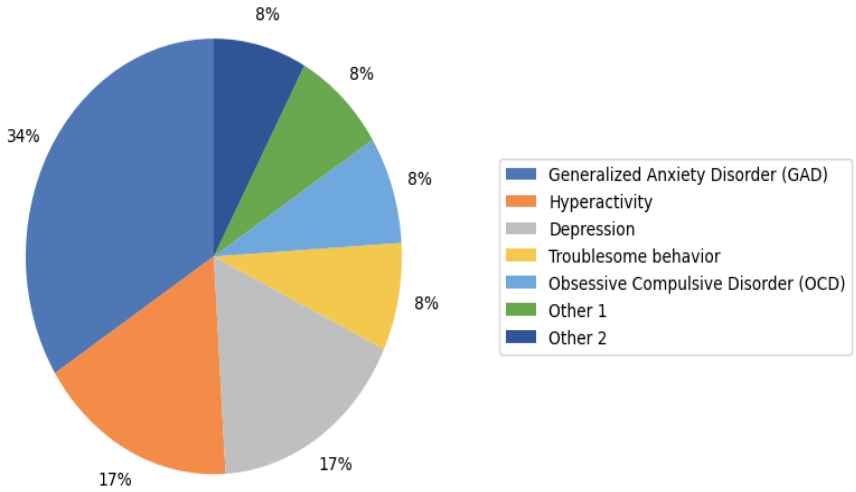

Figure 1: Types of psychiatric disorders among students who had deliberate self-harm

Table I: Difference of stress level based on deliberate self-harm on paired t-test

	Stress level			
	M	SD	T	P
Deliberate self-harm (n=10)	618.20	186.548	2.945	0.012
No deliberate self-harm (n=53)	431.19	171.040		

Table II: Difference in stress level by sex (Independent samples t-test)

	Stress level			
	M	SD	T	P
Male (n=63)	476.50	179.764	0.835	0.408
Female (n=27)	436.22	196.612		

Table III: Types of stressors among participants

Types of stressors	DSH present (n)	DSH absent (%)
Prental pressure for study	80	49.2
Incresed study pressure	40	62.3
Unexpected academic result	50	24.5
Internet/mobile addiction	60	60.4
Death of a close family member	30	41.5
Conflict with parents	70	28.3
Harassment-related problems	40	15.1
Parental conflict	40	65.6
Conflict with classmates	80	22.6
Punitive behavior of teachers	40	30.2
Alteration of personal habits (sleep, appetite, etc)	50	47.2
Alteration of family reles and responsibilities	50	32.1

*DSH=Deliberate Self-Harm

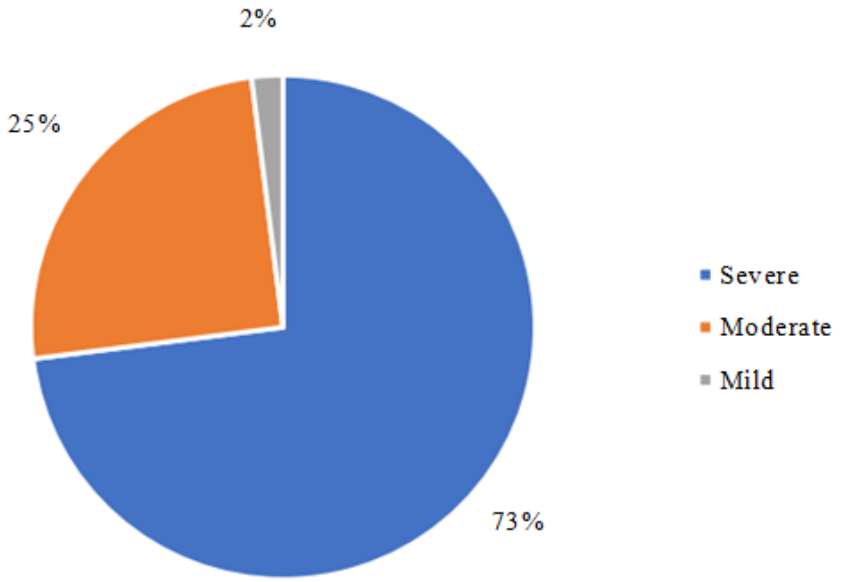

Figure 2: Distribution of severity of stress among the students

Table IV: Pattern of self-harm among the participant

Variable	Present (%)	Absent (%)
Excesssive use of medication	1.6	98.4
Consumpstion of alcohol/drugs	1.6	98.4
Indiscriminate sexual relationships	0.0	100.0
Engaging in a bullying relationship emotionally	1.6	98.4
Engaging in a sexually harassing relationship	0.0	100.0

Table V: Major stress among the participants

Variable	Present (%)	Absent (%)
Excesssive pressure for study by the parents	54.0	46.0
Excessive study pressure	58.7	41.3
Addiction to mobile/internet	60.3	39.7
Death of significant family member	39.7	60.3
Conflict with parents	34.9	65.1
Conflict among parents	54.0	46.0
Low attendance to school	47.6	52.4

The top stressors among participants were excessive pressure for study by the parents, excessive study pressure, addiction to mobile/internet, death of a significant family member, conflict among parents, low attendance to school and conflict with parents. Female outnumbered male in different significant stressors such as excessive pressure for study by the parents, excessive study pressure, addiction to mobile/internet, death of significant family member and conflict among parents. The Dhaka Stress Scale was applied to find the stress among the students and 73% of students reported severe levels of stress.

Table VI: Gender variation in stress among the participants

Variable	Male (%)	Female (%)
Excesssive pressure for study by the parents	48.6	59.3
Excessive study pressure	40.0	85.2
Addiction to mobile/internet	54.3	70.4
Death of significant family member	37.1	44.4
Conflict among parents	48.6	59.3
Low attendance to school	48.6	48.1

Discussion

As hypothesized, the result shows a significant difference in stress levels between self-harm and non-self-harm groups. Students with self-harm have reported higher levels of stressor burden than the non-self-harm group. Though there were no differences inthe severity of stress, 73.0% of students reported severe levels of stress. Between male and female students, more female students have a history of DSH than male students; the result is consistent with other studies on DSH[9]. The results have also shown a relation between DSH and its associations with psychiatric disorders. In the self-harm group, 70.0% had a comorbid condition and 30.0% did not have any comorbid condition, with generalized anxiety disorder being more common. Females outnumbered males in different major stressors such as excessive pressure for study by the parents, excessive study pressure, addiction to mobile/internet, death of a significant family member and conflict among parents. The most common stressors inall students were parental pressure to study, increased study pressure, unexpected results in the study, mobile phone addiction, death of close family members, conflict with parents, harassment-related problems, etc. A study conducted by Mullick et al. in 2019 showed that 16.0% of the subjects who were adolescent population in Bangladesh had severe levels of stress. It can be assumed that this proportion of the adolescent population is the risk population group and has a strong possibility of having psychiatric problems. This rate simulates the prevalence of psychiatric disorders among children and

adolescents, especially during a pandemic where the stressor burden is higher than usual. In developed countries, the prevalence of psychiatric disorders among adolescents ranges from 11.0 to 27.0% and in developing countries, it is 13..00-20%[8].Deliberate self-harm (DSH) is increasingly prevalent, particularly among college students and remains a major risk factor and predictor of suicide. DSH arises from multiple causes, with psychiatric disorders playing a crucial role. Therefore, individualswith a history of DSH should be carefully assessed for underlying psychiatric conditions, as overlooking this history may increase the risk of future suicidal behavior. Haw et al. reported that among 150 patients with DSH, psychiatric disorders were identified in 138 cases (92.0%), with affective disorders being the most common diagnosis (72.0%)[9]. Similarly, students engaging in DSH frequently exhibit psychiatric morbidities such as generalized anxiety, hyperactivity, depression and obsessive–compulsive disorder. Among females, factors associated with DSH include recent self-harm by friends, self-harm among family members, substance misuse, depression, anxiety, impulsivity and low self-esteem.In males, contributory factors include suicidal behavior among peers and family members, substance use and low self-esteem[5]. Consistent with these findings, the present study identified generalized anxiety, hyperactivity, behavioral problems, depression, obsessions and compulsions, post-traumatic stress disorder and panic disorder among students with DSH.

Conclusion

Based on the findings of the study, it could be concluded that self-harm is a common finding among the adolescent population, with prevalence being more common in females than in males. Psychiatric co-morbidities and stressors play an important role in self-harm among the adolescent population. As self-harm is a common problem and most prevalent among the adolescent population, it should not be ignored and adolescents with self-harm should be assessed for psychiatric disorders and brought to the attentionof medical care. Suicide remains a leading cause of mortality among adolescents and repeated self-harm should not be overlooked by either the general population or general physicians, who are often the first responders to self-harm cases in hospital settings. College-based mental health initiatives are therefore essential, including programs to raise awareness about mental health issues and to screen students at risk.

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Original Article

Comparison between Treatment of Unstable Intertrochanteric Fracture of Femur by Dynamic Hip Screws and Proximal Femoral Locked Compression Plate

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Abstract

Background*: Intertrochanteric fractures are among the most frequent types of hip fractures, particularly in elderly individuals with osteoporotic bones. The Dynamic Hip Screw (DHS) remains the gold standard for managing these fractures.*

Objective*: This study aimed to compare the functional and radiological outcomes of unstable intertrochanteric fractures (AO/OTA: 31A2.2, 31A2.3) treated with Proximal Femoral Locked Compression Plate (PFLCP) versus DHS.*

Methods and Materials*: A prospective comparative study was carried out on patients undergoing either PFLCP or DHS treatment between January 2020 and December 2022. Ethical approval was obtained from the Institutional Ethical Review Board (IERB) of President Abdul Hamid Medical College Hospital (PAHMCH) and informed consent was secured from all participants before surgery.*

Results*: Functional outcomes and radiological assessments were evaluated using the Harris Hip Score (HHS) at 3, 6 and 12 months postoperatively. The study found that DHS treatment was associated with higher blood loss (159 ml), longer operative time (105 minutes),and delayed mobilization. In contrast, PFLCP resulted in lower blood loss (73 ml), shorter surgery duration (91 minutes) and earlier mobilization. Limb shortening was greater in the DHS group (9.33 mm) compared to the PFLCP group (4.72 mm).*

Conclusions*:Overall, PFLCP demonstrated advantages over DHS in managing unstable intertrochanteric fractures, including reduced blood loss, shorter operative time, earlier weight bearing and mobilization, shorter hospital stay, lower infection rates and fewer complications*

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Keywords: *Dynamic Hip Screw (DHS), Proximal Femoral Locked Compression Plate (PFLCP), Intertrochanteric*

Introduction

Intertrochanteric fractures have become increasingly common due to advances in technology, high-velocity transportation, increased life expectancy and a higher prevalence of osteoporosis[1]. Gulberg et al. projected that the total number of hip fractures will reach 2.6 million by 2025 and 4.5 million by 2050[2]. In 1990, intertrochanteric fractures accounted for 26.0% of all hip fractures in Asia, rising to an estimated 37.0% in 2025 and 45.0% by 2050[3]. restore both hip function and stability, particularly in olderpopulations, to optimize outcomes and minimize complications[2]. Among the surgical options, two methods have emerged as the primary approaches for these fractures: the Dynamic Hip Screw (DHS) and the Proximal Femoral Locked Compression Plate (PFLCP). More than 90.0% of hip fractures in the elderly are intertrochanteric, with complication ratesranging from 20.0-30.0% and mortality around 17.0%[4,5,6]. Unstable comminuted intertrochanteric Unstable comminuted intertrochanteric fractures require careful surgical intervention to The DHS has long been a cornerstone in intertrochanteric fracture management. It utilizes a sliding screw mechanism to provide dynamic compression at the fracture site,

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enhancing stability during weight-bearing activities[5]. The lag screw, anchored within the femoral head, is connected to a side plate attached to the lateral femoral shaft, leveraging load-sharing principles to allow the bone to bear part of the physiological load. In contrast, PFLCP emphasizes fixed-angle stability, achieved through locking screws and a plate with predesigned holes. This rigid fixation offers superior stability, particularly against rotational forces, making it a compelling alternative to DHS[7,8]. Although both DHS and PFLCP are preferred techniques for managing unstable intertrochanteric femur fractures, comparative analyses remain limited. Understanding their respective mechanisms, biomechanical properties, advantages and limitations is essential. Therefore, our prospective comparative study was designed to evaluate the treatment of unstable intertrochanteric fractures using both PFLCP and DHS. This investigation aims to elucidate the biomechanical principles, benefits and drawbacks of each technique, while also considering factors such as fracture type, patient characteristics and surgeon experience. By doing so, we seek to provide clinicians with comprehensive insights to guide surgical decision-making and optimize patient outcomes in the management of complex femoral fractures.

Methods

Patients meeting the inclusion and exclusion criteria were treated with either PFLCP or DHS. The study enrolled individuals presenting to the Orthopedics Department of President Abdul Hamid Medical College Hospital, a tertiary care facility, with fresh unstable intertrochanteric fractures.

Inclusion criteria: i) Patients aged over 18 years, ii) Fracture duration less than 2 weeksiii) Pathological or osteoporotic fractures, iv) Both male and female patients and v) Intertrochanteric fractures classified as AO/OTA 31A2 and 31A3

Exclusion criteria: i) Polytrauma, ii) Neglected fractures older than 3 weeks , iii) Diabetes mellitus (DM), iv) Hypertension (HTN) and v) History of stroke

Statistical Analysis

After data collection, all information was organized into a master table and subsequently analyzed using IBM SPSS version 24 for Windows. Categorical qualitative data were presented as frequencies and percentages, while quantitative data were expressed asmean ± standard deviation (SD). Statistical significance was evaluated using a one-tailed paired t-test, with p-values <0.05 considered significant.

Surgical Procedure

All surgeries were performed on a single standard fracture table under spinal anesthesia, following standard operative techniques, with C-arm guidance used in every case. Prophylactic intravenous Cefuroxime Axetil 1.5 g was administered before skin incision and continued for 48 hours postoperatively. Intraoperative parameters- including duration of surgery, radiation exposure, blood loss, incision size and other complications- were recorded. In most cases, closed reduction was achieved and the plate was applied using the minimally invasive percutaneous plate osteosynthesis (MIPPO) technique when applicable. Blood loss was calculated using a method similar to that described by Lee et al.[9].

Postoperative care and Follow-up

All patients followed a standardized rehabilitation protocol, starting mobilization on the second postoperative day, including static quadriceps exercises to enhance knee and ankle movement. Drains were removed within 48 hours, wounds were inspected on thesecond postoperative day and sutures were removed between the 10th and 14th postoperative days. Functional outcomes were assessed using the Harris Hip Score (HHS) and radiological evaluations were performed at 3, 6 and 12 months postoperatively. All patients were followed for a minimum of one year, with no dropouts reported.

Results

A total of 30 patients were included in the study, of whom 16(53.0%) were male and 14(47.0%) were female, with a mean age of 60 years (range: 18-85 years). Trivial trauma was the most common cause of injury (77.0%), followed by road traffic accidents (23.0%). Fractures were evenly distributed between the right and left sides (50.0%

each). The PFLCP procedure required a smaller incision, averaging 5 cm, compared to DHS, which required an average incision length of 17 cm, due to distal locking being performed through a percutaneous stab incision in PFLCP. The mean operative time for PFLCP was 90.6 minutes, which was significantly shorter than DHS at 105.3 minutes (p=0.04). Average intraoperative blood loss for PFLCP was 73 ml, markedly lower than the 159 ml observed in DHS procedures (p=0.001).

Table I: Distribution of study patients by characteristics

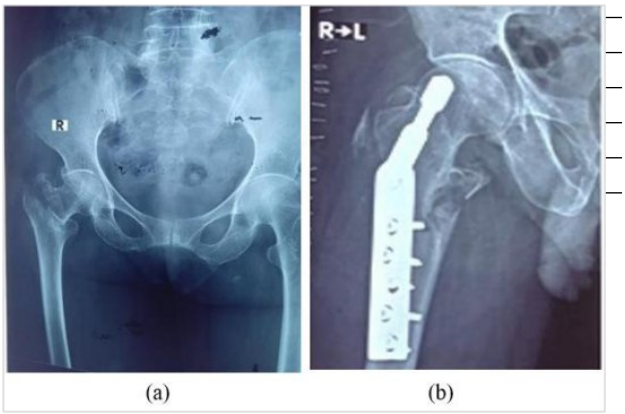

Figure 1: (a) Preoperative anterior-posterior view of an intertrochanteric fracture. (b) Immediate postoperative lateral X-ray showing DHS fixation in the right proximal femur.

Table II: Average number of days/weeks taken for post-operative patient mobilization in each group

Patient mobilization	DHS (n=15)	PFLCP (n=15)
Active hip and knee mobilization	4.27 days	2.33 days
Non-weight-bearing crutch walk	2.93 weeks	1.53 weeks
Partial weight-bearing walking	7.87 weeks	3.73 weeks
Full weight-bearing walking	11.80 weeks	7.93 weeks

Radiological outcomes were evaluated at 3, 6 and 12 months postoperatively. At 3 months, two

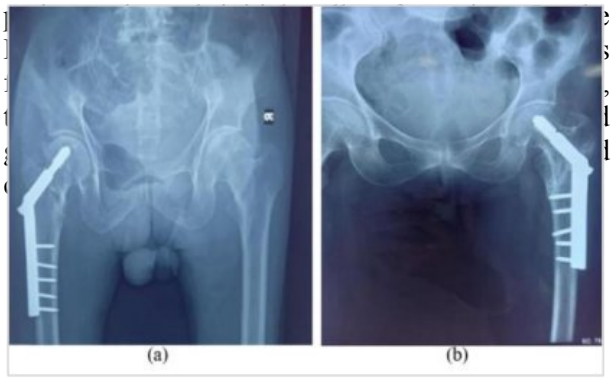

Figure 2: (a) Anteroposterior view at 3 months postoperatively, showing the fracture with maintained neck- shaft angle and stable implant position (b) Anteroposterior view at 6 months postoperatively, demonstrating fracture union of the intertrochanteric region

Table III: Radiological outcome of DHS and PFLCP groups

Follow-up month	DHS (n=15)	PFLCP (n=15)
3rd Month	ACF + Gap-4 (26.7%) ACF-11 (73.3%)	ACF-11 (73.3%) ACF + ^BG Integration–2 (13.3%) ACF With Gap-2(13.3)
6 Month	CAFS-6(40%) CF-8 (53.3%) United In Varus-1 (6.67%)	CF-11(73.3%) CF+ BG Integrated-2 (13.3%)
12th Month	Complete Union-12 (80%) United in Varus-1 (6.67%) Re-fracture-1 (6.67%) Infection-1 (6.67%)	Complete union-13 (86.7%) Screw bend with Union–2 (13.3%)

ACF: Attempted Callous Formation; CAFS: Callous at Facture Site; BG: Bone Grafting; CF: Callous Formation

Table IV: Average functional score (Harris Hip Score; HHP)

Functional score	DHS	PFLCP

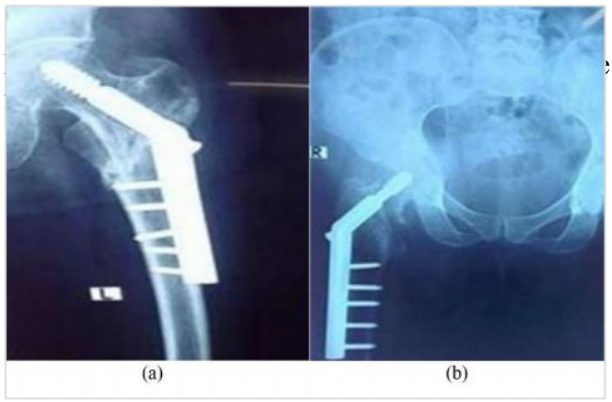

Figure 4: (a) 3 months after operation, X-ray shows uniting intertrochanteric fracture. (b) 6 months after the operation, the X-ray shows callous formation. Postoperative X-ray A/P view shows the position of the implant

At 6 months postoperatively, some variations and complications were observed. In the PFLCP group, all 15 patients achieved good fracture union. In the DHS group, six patients experienced collapse at the fracture site, eight patients demonstrated solid union and one patient developed a varus malunion of 120° due to excessive collapse. By 12 months postoperatively, 13 patients in the DHS group had complete fracture union, while all 15 patients in the PFLCP group showed good union. Functional outcomes, assessed using the Harris Hip Score (HHS) at 6 and 12 months, showed notable differences. At baseline, the average HHS was 32.67 for the DHS group and 52.87 for the PFLCP group (p=0.001). By 6 months, scores improved to 67.6 in the DHS group and 85.4 in the PFLCP group (p=0.001). At 12 months, the mean

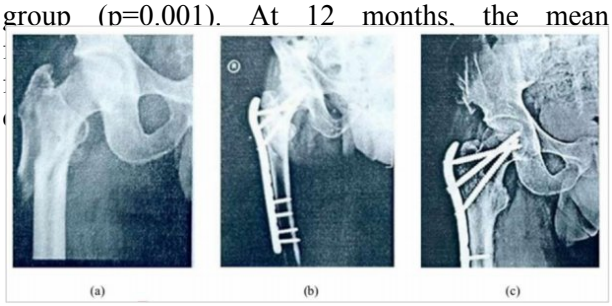

Figure 5: (a) Preoperative X-ray of the hip A/P view showing unstable intertrochanteric fracture. (b) postoperative X-ray of the hip A/P view showing ORIF with PFLCP. (c) After 6 months of operation, the X-ray showed good union

Discussion

Treatment of intertrochanteric fractures remains a significant challenge, with the primary goal being anatomic reduction and stable fixation to allow early functional rehabilitation. Historically, these fractures have predominantly been managed with the Dynamic Hip Screw (DHS)[9]. Over the decades, various fixation devices have been introduced, with treatment choice still depending on fracture type and bone quality. DHS has long been regarded as the gold standard for intertrochanteric fracture fixation. Earlydevices, such as the Smith-Peterson and Jewett nails, emerged in the 1930s, while modifications to sliding devices by Pugh and Massie in the 1950s and 1960s led to the development of the DHS. Kuntscher et al. later introduced an intramedullary nail (IMN)combined with a Sliding Hip Screw (SHS)[10,11,12]. The advantages and disadvantages of the original Gamma nail design have been well documented in studies comparing it with DHS[13,14,15]. Recent evidence suggests

intramedullary devices achieve union rates up to 100.0%, compared to approximately 80% with extramedullary devices[14,15]. However, Kyle et al. noted that initiating sliding in intramedullary devices requires greater force than in DHS constructs[16]. The complication rate for unstable fractures treated with a DHS plate ranges from 3.0% to 26.0%[17]. with primary or secondary varus collapse and hardware failure ("cut-out" of the femoral head screw) being the most common complications[18]. The role of intramedullary devices such as proximal femoral nail (PFN), Gamma nail (GN) and proximal femoral nail anti-rotation (PFNA) in managing unstable intertrochanteric fractures remains controversial, with variable outcomes. Certain fracture patterns-including comminuted intertrochanteric fractures extending into the lateral femoral cortex, long subtrochanteric extensions, reverse oblique fractures and fractures associated with severe osteoporosis- are not reliably managed with DHS. The Proximal Femoral Locked Compression Plate (PFLCP) has emerged as a superior alternative in these cases. Unlike DHS, the lag screw in PFLCP securely stabilizes lateral cortex fragments, reducing the risk of varus collapse and limb shortening[20]. PFLCP provides anatomic reduction, stable fixation and preservation of blood supply. Biomechanically, it is stronger or equivalent to other fixation methods for trochanteric and subtrochanteric fractures[19,20]. DHS is associated with larger incisions, longer operating times, increased fluoroscopy exposure and greater blood loss compared to PFLCP. In previous studies, Glassner et al. reported a 70.0% failure rate with PFLCP (including 30.0% varus collapse and 20.0% each for screw and plate breakage) compared to 12.0% in this study[20]. Karl Wieser et al., in a study of 14 patients, reported four failures using PFLCP and emphasized the importance of proper reduction and restricted weight bearing in unstable fracture patterns[19]. In this study at President Abdul Hamid Medical College Hospital (300 beds, planned expansion to 500 beds), the limited patient population was a constraint, making the sample size a primary limitation. Despite this, PFLCP proved to be a feasible and effective alternative for treating unstable intertrochanteric fractures. Complications, such as proximal locking screw breakage due to increased bending stress at the plate-femur junction, were observed in one case. Proper fracture reduction and restriction of early postoperative weight bearing are essential to prevent such complications. Further biomechanical studies are warranted to more comprehensively assess the effectiveness and safety of PFLCP in managing unstable intertrochanteric fractures.

Conclusion

The primary aim of surgical management for unstable intertrochanteric fractures is to stabilize the fracture, enable early mobilization, restore limb length and achieve pain-free function. These goals were more effectively met using PFLCP compared to DHS.PFLCP shows considerable potential in treating unstable intertrochanteric fractures; however, further randomized controlled trials with larger sample sizes are required to validate these findings.

Conflict of interest

The authors declare that there is no conflict of interest.

Data availability

Data sets analyzed during the current study are available from the corresponding author on reasonable request. No financial or conflicting interests are present.

Authors' contribution

The principal authors contributed to the study's conception and design. Dr. Sabbir drafted the manuscript, while Dr. Sushmoy assisted with data.

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All authors declare that they have no financial or personal relationships with individuals or organizations that could inappropriately influence this work.

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Case Report

Bell's Palsy in Pregnancy: A Case Report

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Abstract

Bell's palsy (BP) is a common condition affecting the facial nerve, often resulting in facial weakness or paralysis. While its exact cause remains unknown, several factors, including pregnancy, can increase the risk. This case report presents a 26-year-oldpregnant woman who developed BP in her third trimester. The patient experienced facial droop, difficulty closing her eye and slurred speech. Considering the expenses, the patient refused further detailed investigations and consultation with a neurologist. Thus, after thorough counseling of the patient and her family, she was treated with corticosteroids for three weeks with tapering dosage and iron/calcium supplements. The patient's condition improved and she delivered a healthy baby vaginally. On follow-up after five weeks, during her postpartum period, the patient and her newborn baby were found healthy. This case highlights the importance of early diagnosis and appropriate management of BP in pregnant women to ensure favorable outcomes for both mother and child. It also provides the physicians of low-resource settings the insight of the patient's perspective of expenses and complexities of receiving treatment through referral services.

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Keywords: *Bell's palsy, Pregnancy, Third trimester, Outcomes*

Introduction

Bell's palsy (BP) was first described by Sir Charles Bell in 1830, a mononeuropathy (a condition in which only a single nerve is affected) affecting the seventh cranial nerve, named as facial nerve[1]. This serious mononeuropathy happens when the fascial nerve is swollen or damaged causing facial muscles to become weak or paralyzed[2]. Although this idiopathic peripheral facial palsy caused by mentioned dysfunctional facial nerve inflammation, the precise etiology of BP is unknown. However, the factors that may increase BP are pregnancy, diabetes, myasthenia gravis, Lyme disease and multiple sclerosis and infections, mostly viral[2,3]. Though BP is common in both men and women, the incidence is slightly more in women3. While the overall incidence of BP is about 25 out of every 100,000 people, its prevalence has been identified as45 cases per 100,000 pregnant women annually[4,5]. During pregnancy; majority of severe BP cases occur in the third trimester or the postpartum phase and is a special medical condition that needs unique treatment. While we don't fully understand the connection between BP and pregnancy, it is often thought that high blood pressure and obesity are risk factors associated with BP during pregnancy[6]. This case report aims to help us better understand the complexities of facial nerve palsy in pregnant women and emphasize the importance of healthcare providers in ensuring the best possible outcomes for both the mother and her baby.

Case Report

A 26-year-old multigravida, presented to the Obstetrics and Gynecology outpatient clinic of President Abdul Hamid Medical College and Hospital with the complaints of 28 weeks of gestation, mild fever for two days and suddenon the right side of her face. It was her third pregnancy.

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She had previous two vaginal birth at home. She did not receive any antenatal care during her previous two pregnancy and in this index pregnancy as well.She had an unremarkable medical history with no history of any chronic medical condition and her pregnancy period was going well until she suddenly developed mild fever for two days. She also complained of drooling. These symptoms had been there for more than 24 hours. She didn't, then she noticed facial symptoms one day back. She noticed that the right side of her face was weak and she couldn't fully close her left eye, which made her eye dry.She also noticed that the right side of her mouth was drooping, difficulty in chewing and slurred speech. have any other problems with her nervous system or body. On examination, it was clear that her face was not symmetrical, her right eye didn't close completely, she couldn't keep her mouth completely closed and the right side of her mouth was drooping. She also had trouble making different facial expressions on the right side. Her vital signs were within normal ranges. The fetus was healthy with normal physical activities, fetal heart sound and adequate amniotic fluid as identified in ultrasonography. We requested her for a neurology consultation and to have further investigations for the facial nerve palsy. We advised her for a Magnetic Resonance Imaging (MRI) to identify structural abnormalities or lesions affecting the facial nerve. However, the patient refused to continue further investigations or consultation except for obstetrics consultation. After appropriate counseling of the patient, her husband and mother-in-law, we prescribed her steroid. The dosage schedule included tablet prednisolone at 10 mg three times daily for the initial five days, followed by two times daily for the subsequent five days, then reduced to once daily for another five days and finally, once in every alternate day for five days. She received regular iron and calcium supplementation as well. The patient came back after two weeks for follow up, then every four weeks and she completed total three follow ups before delivery. Her condition steadily got better and her fetus was healthy all along. She was counselled for hospital delivery and shedelivered a healthy male baby vaginally at her 40 weeks two days after spontaneous onset of labour pain. After 24 hours of hospital stay the patient with her newborn were discharged from hospital, both healthy. She came back on her 35-day post-partum for follow up and both the mother and baby were found well.

Discussion

Facial paralysis during pregnancy can be particularly isolating, however, may become frightening. This is a time of heightened emotions and discovering a facial paralysis can be a significant shock. A study conducted by Hilsinger et al. suggests that BP is 3.3 times higher in pregnant women[5]. Another research revealed a reduced event of BP in the early stages of pregnancy, with a two- to-four-fold increase in frequency during the last trimester and the puerperium[7]. We identified the case of BP during early third trimester. The most common presenting symptom of Bell's palsy is a one-sided facial droop. Other common symptoms, which typically occur on the affected side, may include: loss of feeling in the face, headache, excessive tear production, ringing in the ear, drooling, impaired speech, loss of the sense of taste, hypersensitivity to sound, inability to close the eye or blink properly, difficulty smiling and change in speech[6]. In this case, she had right sided fascial nerve palsy and we identified several of these above-mentioned symptoms, which were asymmetrical facial expression. She was not able to close her right eye completely, couldn't keep her mouth completely closed, the right side of her mouth was drooping, had trouble making different facial expressions on the right side. The common differential diagnosis of BP are fascial trauma, stroke, facial nerve tumors (neuromas, meningiomas, hemangiomas and malignant primary and metastatic lesions), Guillain- Barré syndrome, basilar meningitis, cerebellar pontine angle tumor etc[8]. In this case, the patient had no other neurological symptoms and considering the expenses she required the patient party refused further investigations. Thus, after thorough counseling of the patient and her family we managed the case as BP with steroid.

Conclusion

It was acknowledged that facial nerve palsy during pregnancy is a relatively rare clinical entity with multifactorial potential causes. The need for a multidisciplinary approach was paramount to ensure optimal care for the pregnant woman and the developingfetus. Personalized management

strategy is imperative and we need to consider patients' socio-economic condition and her desires. This case study explains the specific details of BP in pregnant women along with the complexities of its treatment and socio-economic background of the patient in context of developing country.

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Review Article

Comprehensive Review of the Russell's Viper (Daboiarusselii): Biology, its Venom, Clinical Significance and Management of Bites

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Abstract

The Russell's viper (Daboia russelii) is a severely venomous land snake commonly found throughout South Asia and certain areas of Southeast Asia. It contributes to a significant number of snakebite-related injuries and deaths within its habitat due to itscommon presence, defensive behavior and potent hemotoxic venom. This snake frequently inhabits open terrain, grasslands, farmlands and areas near human settlements, which increases the likelihood of encounters with people. Its venom consists of a sophisticated blend of enzymes and poisons that lead to blood clotting disorders, extensive local tissue injury, kidney failure and widespread systemic effects. While the Russell's viper serves a valuable ecological function by controlling rodent numbers, it remains a major public health issue in numerous rural areas. Ongoing scientific focus on enhancing antivenom efficacy, protecting its habitat and minimizing human-snake interactions remains vital for addressing the dangers posed by this species.

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***Keywords**: Bangladesh, Public health, Toxins, Venomous and Venom*

Introduction

Recently, a particular snake species, the Russell's Viper, has become a widely discussed subject across social media platforms in Bangladesh. Conversations about this highly venomous reptile have spread far beyond online forums, becoming a common topic ineveryday settings like tea shops and informal chats[1]. Two distinct species of Russell's viper exist globally. Daboia russelii is present in Pakistan, India, Nepal, Bhutan, Bangladesh and Sri Lanka, whereas Daboia siamensis is found in China, Myanmar, Indonesia, Thailand, Taiwan and Cambodia. The former species is the one located in Bangladesh[2]. The Bangladesh National Guideline for Management of Snakebite notes that the country hosts around 100 snake species, with 37 being venomous. This group includes 16sea snakes, three cobra species (including the king cobra, Ophiophagus hannah), five krait species, two coral snake species, six pit viper species and a single true viper species: the Russell's viper[3]. Daboia russelii is a highly venomous snake belongingto the Viperidae family, indigenous to South Asia[4]. The genus name 'Daboia' originates from a Hindi term meaning "the lurker" or that which lies hidden[5]. The snake's common name honors Patrick Russell, a Scottish herpetologist[6]. Locally in Bangladesh, it is often called ChandraBora or Ulubora and is sometimes mistaken for a young python[1]. This misidentification has led to the unnecessary killing of non-venomous pythons and Common Wolf Snakes, which can disrupt local ecosystems[7]. Its physical features include large nostrils; eachcentered in a big nasal scale. The eyes are prominent, often with yellow or gold speckles and are encircled by 10-15 scales. The body is robust with a rounded cross-section and the tail is short, making up roughly 14.0% of its total length, with 41-68 paired scales underneath[8]. Primarily a ground-dwelling snake. the Russell's viper is also capable of water and can swim well. It is generally active at dawn, dusk and night in warmer conditions but may become diurnal during cooler weather[2]. Mature snakes are described as slow-moving and lethargic typically avoiding confrontation unless disturbed; however, they can deliver a strike with exceptional rapidity Younger individuals agitated. When feeling endangered, they coil their bodies into a series of S-shapedcurves, liftlift the anterior portion of their body,and generate adistinctive hiss reported to be louder than that of any other snake species[8]. While raising the forebody is a typical defensive posture for many snakes, these vipers are distinguished by their capacity to raise a greater distinguished by their capacity to raise a greater portion of their body from the surface compared to similar species[5]. The forceful hiss of the Russell's viper, along with the rasping sound of

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the saw-scaled viper, serves as both a warning signal and an identifiable acoustic trait[9]. The Russell's viper possesses one of the most sophisticated venom delivery systems among snakes. Similar to other vipers, it has long, hinged fangs at the front of its upper jaw that function like hypodermic needles. Although lifting the front part of the body is a common defensive stance for numerous snakes, this viper species is notable for being able to elevate a larger segment of its body off the ground than related snakes[5]. The powerful hiss of the Russell's viper, combined with the distinctive grating noise made by the saw-scaled viper, acts as an auditory warning and a

Figure 2: Open-mouth view of a venomous snake showing exposed fangs and oral cavity

This viper has one of the most evolved mechanisms for injecting venom in the serpent world. Like all vipers, its upper jaw contains lengthy, hinged fangs at the front that operate similarly to syringe needles. This allows the snake to deliver venom effectively through a rapid stab, rather than needing to hold onto its target. This efficient mechanism also lets it confront larger prey with less danger[10]. The Russell's viper is ovoviviparous[11] and a highly fertile species. Broods typically consist of 20 to 40 young[8]. though smaller litters, sometimes just a single offspring, are possible[12]. The largest recorded litter size is 75 young[13]. These snakes reach reproductive maturity between twoand three years of age. Females bear live young, with litter sizes ranging from 6 to 63, primarily from May to November. The peak birthing season is June and July, following a gestation period longer than six monhs[2].

Discussion

The 2021 Mongabay article "Tracking Russell's viper in rural Karnataka unravels their behaviour" noted that during the research, Glaudas had numerous close interactions with these vipers without being bitten, as they typically remain concealed in vegetation. The snakes usually stayed still and only occasionally moved further into cover or pulled their heads back to hide. Researcher Xavier Glaudas emphasized that, contrary to common perception, vipers are not aggressive. He defined an unprovoked strike as aggressive behavior and explained, "Snakes bite in defense because they are frightened of us; one can think of it as them fighting for their life when faced with a large, moving creature"[6]. Zohra Mila, a wildlife and biodiversity conservation officer with the Bangladesh Forest Department, stated: "The Russell's Viper does not strike at people unless it feels threatened. This snake does not even enter homes, as it prefers to avoid human contact." She advised, "To avoid snake bites, one should make noise or use a flashlight before venom in the serpent world. Like all vipers, its upper jaw contains lengthy, hinged fangs at the front that operate similarly to syringe needles. This allows the snake to deliver venom effectively through a rapid stab, rather than needing to hold onto its target. This efficient mechanism also lets it confront larger prey with less danger[10]. The Russell's viper is ovoviviparous[11]. and a highly fertile species. Broods typically consist of 20 to 40 young[8]. though smaller litters, sometimes just a

single offspring, are possible[12]. The largest recorded litter size is 75 young[13]. These snakes reach reproductive maturity between twoand three years of age. Females bear live young, with litter sizes ranging from 6 to 63, primarily from May to November. The peak birthing season is June and July, following a gestation period longer than six monhs[2]. entering a paddy field"[7]. In professions with a high risk of snakebite, such as rice cultivation and aquaculture, employers could be considered responsible for supplying protective gear like boots[9]. This year, at least ten individuals, primarily agricultural and fishing workers, have died from bites by this viper. Reports indicate the snake is now found in at least 25 districts across Bangladesh[6]. Information from Rajshahi Medical College shows that between 2013 and 2023, 202 patients wereadmitted after being bitten by Russell's Vipers, with a mortality rate of 30.0%[7]. Recent reports confirm its presence in nine districts, while older records document it in eleven others, totaling seventeen out of sixty-four districts in Bangladesh. The most affected areas are Chapai Nawabganj and Rajshahi, where twenty fatalities occurred from 2013 to 2016[2]. A separate five-year study of 336 snakebite cases at Mymensingh Medical College Hospital found that 70.0% of victims were aged 11-30 years and 75.0% were male (Bhuiyan, WHO, New Delhi, 1981, unpublished).

Geographic distribution and public health

Impact Bangladesh is among the region's most severely impacted by snakebites, owing to its geographic setting, tropical climate, dense population, farming activities and frequent human-wildlife encounters[14]. In 2002, the International Union for Conservation of Nature (IUCN) listed the Russell's Viper as extinct within Bangladesh. Although the species traditionally favors dry zones like the Barind region, experts and officials now report its spread to at least 35 districts, including several coastal areas[1]. Snakebite incidence is higher in males than in females, except in sectors where the labor force is mainly female, such as tea and coffee harvesting. Children and young adults represent the most commonly bitten age groups, with some data suggesting the highest fatality rates occur in young children and the elderly. For pregnant individuals, snakebite poses clear- though not fully quantified- risks to both mother and fetus, primarily from hemorrhage and potential miscarriage. Most bites affect the lower legs and feet of agricultural workers[9]. If encountering a snake, avoid trying to kill it, as this can be hazardous. Also, never handle a snake, even a severed head, with bare hands, as it can still deliver a bite[9]. The viper's population has grown as farming practices intensified to two or three annual harvests, ensuring a constant crop presence. This continuous food supply attracts rats, the snake's primary prey, providing ample nourishment that supports rapid reproduction[6]. Outbreaks of snakebite can follow major floods, as documented in India, Bangladesh and Myanmar, or when large workforces enter snake habitats for projects like road construction, logging, or irrigation schemes-such as Sri Lanka's Mahaweli project- which alter local ecology and attract both snakes and farmers. In Myanmar, no immediate surge in bites followed Cyclone Nargis, but an increase was noted 9-12 months later[9].

Vipera russelli (Shaw), or Russell's viper, has an irregular distribution across ten South Asian nations and is a major cause of lethal envenomation in Pakistan, India, Bangladesh, Sri Lanka, Myanmar and Thailand, ranking as the fifth leading cause of death in Myanmar[15]. The World Health Organization classifies snakebite as a neglected tropical disease and has prioritized its management[16]. A core issue across much of the Asia-Pacific region is that snakebite care often falls to traditional, herbal, or Ayurvedic healers, meaning most victims are never treated or recorded in formal medical facilities. For instance, one traditional herapist in Thailand treated between 72 and 393 bite cases annually from 1985 to 2002[9]. Syeda Anannya Faria, a compliance and development officer at the Deep Ecology and Snake Conservation Foundation (DESCF), noted: "Fatalities often result from delayed hospitaladmission after a bite. In Bangladesh, many patients still consult traditional healers first." She added, "There are instances where hospitalized patients were taken by relatives to shamans, only to return in worse condition"[7].

Venom and clinical manifestation of envenomation

The volume of venom an individual D. russelii can deliver is substantial. Reported yields from adult snakes range from 130-250 mg, 150-250 mg and 21-268 mg[8]. Since a lethal dose for most humans is estimated at 40-70 mg, a single bite can easily inject a fatal amount. The overall venom potency

results from a synergistic mix of at least five distinct components, each of which is less toxic in isolation. Both the toxicity and the clinical symptoms following a bite can vary among different geographic populations and over time[8]. Contrary to widespread opinion, the Russell's Viper is not the most venomous snake in Bangladesh. Its median lethal dose (a measure of venom strength) is lower than that of the Cobra. In fact, the Common Krait is responsible for the greatest number of snakebite fatalities in the country[7]. A study from 1988-1989 documented 764 bites with 168 deaths (a 22.0% fatality rate); among these, 34.0% were cobra bites, which carried a 40.0% mortality rate[9]. The venom is a complex mixture, primarily targeting the blood and tissues, causing rapid internal hemorrhage. It also contains various cytotoxins that destroy cells, leading to tissue death and significant damage in larger victims[10]. Symptoms of envenomation start with immediate pain and swelling at the bite site. Bleeding- often from the gums, in the urine, or in sputum- can begin within 20 minutes. Blood pressure and heart rate drop. Blistering appears near the bite and can spread along the limb in serious cases. Tissue necrosis is typically superficialbut can be extensive. Vomiting and facial swelling occur in roughly a third of patients[8]. In a clinical series, 55 patients had confirmed Russell's viper bites, while 154 were suspected cases. Common complications included blood clotting disorders (76.1%), kidney impairment (18.7%), neuromuscular paralysis (69.9%) and local tissue damage (91.9%), appearing in various combinations. Abdominal pain was present in 79.5% of these patients, starting 5 minutes to 4 hours post-bite[17]. Acute kidney injury develops in about 25.0-30.0% of untreated bites. Severe cases mayalso involve disseminated intravascular coagulation. Prompt medical care and antivenom administration are critical to preventing these life-threatening complications. Intense pain can persist for 2-4 weeks and swelling often peaks within 48-72 hours, sometimes spreading to the trunk. Trunk involvement within 1-2 hours indicate severe envenomation. Discoloration from leaked blood cells and plasma may appear throughout the swollen area[18]. Death can result from sepsis, or kidney, respiratory, or cardiac failure, occurring 1 to 14 days post-bite or later[18]. Neuromuscular weakness is a frequent symptom, caused by toxins that either block nerve signals or directly damage muscle fibers[19]. The venom contains multiple procoagulant enzymes that activate clotting factors, potentially triggering disseminated intravascular coagulation within 30 minutes. A metalloproteinase damages blood vessels and other components impair platelet function, leading to clotting, hemorrhage, edema and shock. Acute kidney failure is themost common fatal complication. Hemorrhage and micro-clots in the pituitary gland can cause pituitary infarction, resulting in acute or chronic pituitary hormone deficiency (hypopituitarism) in long-term survivors, a condition rarely seen with other snakespecies[20]. A study in The Lancet found that 29% of survivors suffered significant pituitary damage leading to hypopituitarism[21]. a finding supported by other research[4]. Thrombotic strokes, confirmed by imaging, have also been rarely reported following envenomation, particularly in Sri Lanka[9].

Table I: The percentages of patients with each symptom, in a study in Myanmar[22].

Symptom	Percentage
Death	09
Kidney failure	29
Blood incoagubility	59
Local Swelling at the site of the bite	73

The most severe consequences of the venom involve its disruption of the blood's clotting system, which critically impacts kidney performance. Within a cohort of 45 patients who required dialysis, 14 succumbed. Research will be conducted to simulate the venom's biochemical effects, aiming to establish optimal criteria for initiating dialysis and determining the required duration of treatment[22].

Treatment approaches

Recommended first-aid methods[9]

1. Calm the individual, as they may be experiencing significant distress.
2. Keep the patient completely still by having them lie down in a secure and relaxed posture. Specifically, prevent movement of the affected limb using a splint or sling. Physical activity or muscle contraction speeds up the absorption of venom into the circulatory and lymphatic systems.
3. If resources and training permit, apply pressure-immobilization or a pressure pad, unless a bite from an elapid snake (e.g., cobra, krait) has been

definitively ruled out. In Myanmar, the pressure pad technique has shown effectiveness
for Russell's viper envenomation.
4. Refrain from any manipulation of the bite site- such as cutting, scrubbing, aggressive washing, massaging, or applying traditional or chemical substances- as this can lead to infection, enhance venom uptake and worsen local
hemorrhage.
Removing tight bands or tourniquets: These should ideally remain in place until the patient has reached a medical facility with resuscitation equipment and has begunreceiving antivenom therapy[9]. Antivenom is the sole specific antidote for snakevenom. It is a critical component for treating systemic envenomation, though it may not aloneguarantee survival.This treatment was pioneered by Albert Calmette at the Institut Pasteur in Saigon during the 1890s[23]. Antivenom consists of purified immunoglobulin derived from the blood plasma of horses, mules, donkeys, or sheep that have been immunized with venom from one or more snake species[9]. In India, the Haffkine Institute produces a polyvalent antivenom effective against bites from this species. In late 2016, anew antivenom developed by Costa Rica's Clodomiro Picado Institute entered clinical trials in Sri Lanka[4]. A common misunderstanding is that no effective antivenom exists for Russell's Viper[24]. In fact, the government supplies it free of charge at district (Sadar) hospitals and upazila health centers. The private pharmaceutical company Incepta also markets antivenom for Russell's Viper, Cobra, Common Krait and Saw-scaled Viper[7].
Antivenom must never be administered intra-muscularly if intravenous delivery is possible. Injection into the gluteal region should be avoided due to slow, unreliable absorption and the risk of sciatic nerve injury, especially when given by untrained personnel. Sincesnakes inject the same venom quantity into children and adults, pediatric patients require a full adult dose of antivenom[9]. According to Aniruddha Ghose, principal investigator at the government-funded Venom Research Centre Bangladesh, diagnosing envenomation is challenging due to the absence of a serological test to detect venom in patient samples. Diagnosis often relies on victim or witness accounts or identification of the snake by a clinician. The current national protocol recommends antivenom administration when the clinical presentation meets defined criteria[3]. Indications for administering an additional dose of antivenom beyond the initial one[9].
1. Continued or returning inability of the blood to clot six hours after treatment, or ongoing bleeding one to two hours post-treatment.
2. Worsening neurological symptoms (such as paralysis) or cardiovascular instability (such as low blood pressure) one to two hours after the first dose.

Research from the Venom Research Centre at Chittagong Medical College indicates these antivenoms are close to 100% effective against the venom. The Bangladeshi government is implementing steps to improve antivenom availability, prioritizing high-incidenceareas and guaranteeing access in distant locations[5]. Epinephrine (adrenaline) must always be prepared in advance to address any immediate severe allergic reaction to the antivenom. For neurotoxic envenomation causing throat muscle and respiratory failure,antivenom alone may not prevent fatal suffocation; mechanical ventilation becomes critical in these situations. Supportive care, including dialysis when necessary, is an effective approach for managing acute kidney injury resulting from bites by Russell'svipers, hump-nosed vipers and sea snakes. When antivenom is unavailable, careful and attentive conservative treatment can often sustain the patient's life[9]. It is now crucial to conduct widespread public education to dispel the common misconceptions aboutRussell's viper[5].

Future research

This analysis, which relies on information from news articles, social media platforms and published academic papers, may be subject to biases in how incidents are reported and how the species' range is mapped. To verify data on habitat utilization and movement behaviors, future studies should integrate direct field observations, radio-tracking methods and interviews with local communities. Furthermore, examining the genetic variation within D. russelii populations could help elucidate their ability to persist and their level of connectedness across divided habitats.

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