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Pattern and Management of Epistaxis as A Leading Ent Emergency in Bangladeshi Tertiary Care Hospitals

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Abstract **Original Research Article**

Background: Epistaxis is one of the most common otolaryngological emergencies worldwide, ranging from mild self-limiting bleeding to life-threatening hemorrhage. In Bangladesh, epistaxis is a frequent cause of ENT emergency visits, yet comprehensive hospital-based data on its patterns, etiologies, and management remain limited. Objective: To evaluate the epidemiological profile, etiological factors, management strategies, and treatment outcomes of epistaxis in tertiary care hospitals of Bangladesh. ***Methods:*** A descriptive, observational study was conducted over nine months (January–September 2024) in selected tertiary care hospitals across Bangladesh. A total of 180 patients presenting with anterior or posterior epistaxis were included. Data on demographics, clinical presentation, causes, comorbidities, treatment methods, and outcomes were collected using a structured form. Descriptive statistics summarized findings, and associations between clinical variables and outcomes were assessed using Chi-square and t-tests, with $p < 0.05$ considered significant. ***Results:*** The mean age of patients was 45.8 ± 12.2 years (range 18–78), with females accounting for 54.4% of cases. Rural residents comprised 53.3%. Anterior epistaxis was most common (56.7%), followed by posterior (25.6%) and combined (13.3%). Trauma (15.6%), coagulopathy (15.6%), and idiopathic causes (13.3%) were leading etiologies. Nasal packing was the most frequent initial treatment (45.0%), followed by cauterization (20.0%) and medication (16.1%). Surgical intervention was required in 18.9% of cases. Rebleeding occurred in 25% of patients. Type of epistaxis, presence of comorbidities, and initial treatment method were significantly associated with both rebleeding and surgical intervention ($p < 0.05$). ***Conclusion:*** Epistaxis in Bangladeshi tertiary care hospitals is predominantly anterior and frequently managed with nasal packing. Conservative measures remain effective in most cases, though recurrence is more likely with posterior bleeds and in patients with comorbidities. Enhancing access to specialist care and advanced interventions could further improve outcomes.

Keywords: Epistaxis, Nosebleed, Bangladesh, Otorhinolaryngology, Nasal packing, ENT emergency.

INTRODUCTION

Epistaxis, commonly known as nosebleed, is one of the most frequently encountered emergencies in otorhinolaryngology (ENT) worldwide, representing a significant proportion of urgent medical presentations across various healthcare settings. [1] the clinical spectrum of epistaxis ranges from mild, self-limiting bleeding episodes to severe, life-threatening hemorrhages requiring immediate and sometimes complex interventions. Globally, the lifetime incidence of epistaxis has been estimated to reach up to 60% in the general population, although only a small fraction of these cases necessitates hospital-level care.[2] the burden of epistaxis on emergency departments and ENT services is particularly pronounced in resource-limited settings, where timely access to specialist care and diagnostic facilities may be restricted.

In Bangladesh, like many low- and middle-income countries (LMICs), epistaxis constitutes one of the leading ENT emergencies presenting to tertiary care hospitals. This reflects both the high incidence and the complex management challenges associated with epistaxis in this population. [3] National data on the epidemiology of epistaxis remain sparse; however, hospital-based studies from urban tertiary centers in Dhaka and other major cities have documented epistaxis as the predominant cause of ENT emergencies, surpassing other acute diagnoses such as upper airway

obstruction and foreign body aspiration. [4] Against the backdrop of Bangladesh's rapidly urbanizing population and evolving healthcare infrastructure, the effective management of epistaxis assumes critical importance, with significant implications for patient outcomes, resource utilization, and healthcare policy.

The demographic profile of patients affected by epistaxis in Bangladesh reveals a pattern consistent with international observations but also localized variations. Middle-aged and elderly males constitute the majority of cases, with a male-to-female ratio ranging from 1.5:1 to 2 be influenced by occupational exposure to trauma, higher prevalence of hypertension, and lifestyle factors such as smoking, which are known risk factors for vascular fragility and bleeding. [6] Geographically, urban populations appear more frequently affected, possibly due to better access to tertiary care and differences in environmental and occupational risks. Seasonal and circadian trends are also noteworthy; epidemiological data suggest peak incidence during dry, cooler months correlating with mucosal dryness and increased risk of nasal mucosal injury, as well as an increased frequency of episodes occurring in the evening hours. [7]

Etiologically, epistaxis has a multifactorial origin, which necessitates careful diagnostic evaluation to guide targeted management. The most common site of bleeding is the anterior nasal septum, particularly the Kiesselbach's plexus (also known as Little's area), a vascular-rich zone supplying the anterior nasal mucosa. [8] Anterior epistaxis is generally less severe and more amenable to conservative treatment. However, posterior epistaxis, often originating from the sphenopalatine artery or other deeper branches, is less common but associated with more severe bleeding and greater risk of morbidity and mortality. Posterior bleeds pose diagnostic and therapeutic challenges, frequently requiring advanced interventions such as posterior nasal packing, arterial ligation, or endovascular embolization. [9]

Common causes of epistaxis in the Bangladeshi context include idiopathic instances, trauma, hypertension, coagulopathies, and local infections or tumours. [10] Traumatic epistaxis is frequently linked with occupational hazards, especially in the predominantly agrarian population where mechanical injury and minor facial trauma are prevalent. [11] Systemic hypertension, a significant comorbidity, contributes to vessel wall fragility and dysregulated haemostasis, thereby increasing the risk of spontaneous or recurrent nosebleeds. Additionally, the use of medications such as anticoagulants and antiplatelet agents has become increasingly relevant as cardiovascular disease management advances in Bangladesh, further complicating epistaxis management. Other contributory factors include nasal mucosal dryness due to climatic conditions, inflammatory nasal diseases such as allergic rhinitis and chronic sinusitis, as well as bleeding diatheses from haematological disorders.

Management strategies for epistaxis have evolved over time and necessitate a structured, stepwise approach in tertiary care settings. Initial management typically involves conservative measures, including application of digital pressure, use of topical vasoconstrictors (e.g., oxymetazoline), nasal decongestants, and chemical or electrical cauterization of bleeding points in anterior epistaxis cases. In more severe or refractory cases, mechanical tamponade with anterior or posterior nasal packing is employed. Although nasal packing remains a time-tested intervention, it is associated with discomfort, potential mucosal injury, infection risk, and occasionally, complications such as toxic shock syndrome. Surgical options are reserved for cases unresponsive to packing, including arterial ligation of the internal maxillary or anterior ethmoidal arteries. Recently, interventional radiology techniques such as angiographic embolization have emerged as valuable tools for managing intractable epistaxis, particularly posterior bleeds, though such facilities may not be universally available in all Bangladeshi tertiary centres.

Despite the availability of international guidelines on epistaxis management from otolaryngological societies, actual practice in Bangladeshi tertiary care hospitals often reflects adaptations to local resources, patient demographics, and clinician expertise. Resource constraints, limited availability of endoscopic surgical instruments, and lack of widespread interventional radiology services necessitate reliance on clinical judgment and traditional management protocols. Multidisciplinary collaboration among otolaryngologists, anaesthesiologists, haematologists, and interventional radiologists is critical to optimize patient outcomes in complex cases.

Given the significant morbidity associated with epistaxis and its resource implications, it is imperative to understand the local patterns and management practices in Bangladesh's tertiary care hospitals. This study addresses this gap by analysing epidemiological data, clinical presentations, etiologic factors, and current therapeutic approaches for epistaxis. Insights derived from this research can contribute to the development of standardized clinical pathways, improve resource allocation, and guide healthcare policy to enhance the management of ENT emergencies in Bangladesh. Ultimately, such endeavours will contribute to reducing the burden of epistaxis and improving patient care quality in this high-impact clinical area.

OBJECTIVE

This study aimed to evaluate the pattern and management strategies of epistaxis as a leading ENT emergency in Bangladeshi tertiary care hospitals,

including the demographic characteristics and clinical presentation patterns of patients, common etiological factors contributing to epistaxis, various management modalities employed and their outcomes, seasonal and temporal distribution of cases, and treatment success rates and complications associated with different therapeutic interventions.

METHODS AND MATERIALS

Study Design and Setting:

This descriptive, observational study was conducted in selected tertiary care hospitals across Bangladesh, encompassing both public and private institutions equipped with otorhinolaryngology departments. The study was carried out over a nine-month period, from January 2024 to September 2024, allowing for the inclusion of seasonal variability in epistaxis presentation.

Study Population:

A total of 181 patients presenting to the ENT emergency departments with a primary diagnosis of epistaxis were included in the study. Inclusion criteria encompassed patients of all ages and both sexes presenting with anterior or posterior epistaxis. Patients with post-surgical nasal bleeding, incomplete clinical data, or bleeding secondary to facial malignancies were excluded.

Data Collection:

Data were collected using a structured, pretested data collection form. The recorded parameters included demographic characteristics (age, sex), clinical features (site, severity, and laterality of bleeding), predisposing factors (hypertension, trauma, coagulopathies, medication use), and co-existing nasal or systemic conditions. The classification of epistaxis into anterior and posterior types was made based on clinical examination and, when needed, nasal endoscopy.

Management approaches were documented and categorised into conservative (e.g. direct pressure, topical vasoconstrictors, chemical cautery), non-surgical interventions (anterior or posterior nasal packing), and advanced procedures (e.g. surgical arterial ligation or endovascular embolisation). Treatment outcomes, recurrence rates, complications, and the requirement for hospital admission were also recorded.

Diagnostic and Therapeutic Procedures:

All patients underwent anterior rhinoscopy upon presentation. Where clinically indicated, posterior rhinoscopy or nasal endoscopy was utilised to identify the bleeding source. Routine investigations included blood pressure measurement, complete blood count, and coagulation profile. Advanced imaging (e.g. computed tomography or angiography) was performed selectively for suspected posterior bleeds or underlying structural pathology.

Management was administered in accordance with institutional protocols, with modifications based on clinical severity and availability of resources. In cases of recurrent or intractable epistaxis, multidisciplinary consultation involving haematology, anaesthesiology, and interventional radiology was arranged.

Data Analysis:

All data were anonymised and analysed using a statistical software package (e.g. SPSS, version 24). Descriptive statistics such as means, standard deviations, frequencies, and percentages were used to summarise the demographic and clinical characteristics of the patients. Associations between clinical variables and treatment outcomes were explored using appropriate statistical tests, including the Chi-square test and Student's t-test, with a p-value < 0.05 considered statistically significant.

Ethical Considerations:

Ethical approval for the study was obtained from the Institutional Review Boards (IRBs) of the participating hospitals. Informed written consent was obtained from all patients or their legal representatives prior to inclusion. The study was conducted in accordance with the ethical standards outlined in the Declaration of Helsinki.

RESULTS

A total of 180 patients diagnosed with epistaxis were included in the study. The mean age was 45.8 ± 12.2 years (range: 18–78 years), with a slight predominance of females (54.4%). Over half of the patients resided in rural areas (53.3%), and the most common occupational groups were unemployed individuals (21.7%), farmers (18.9%), and laborers (17.2%).

Table-1: Demographic Characteristics of Patients with Epistaxis (n = 180)

Variable	Category	Frequency (N)	Percent (%)
Age (years)	-	-	-
	Mean (SD)	45.8 (12.2)	-
	Minimum	18	-
	Maximum	78	-
Sex	Female	98	54.4
	Male	82	45.6
	Total	180	100
Residence	Rural	96	53.3

Variable	Category	Frequency (N)	Percent (%)
	Urban	84	46.7
	Total	180	100
Occupation	Business	19	10.6
	Farmer	34	18.9
	Laborer	31	17.2
	Office Worker	27	15
	Student	30	16.7
	Unemployed	39	21.7
	Total	180	100

Table 1 shows that the mean patient age was 45.8 years, with slightly more female than male participants. Rural residents made up a slightly higher proportion than urban residents. The largest occupational groups were unemployed individuals, farmers, and laborers.

Table-2: Clinical Presentation and Etiology of Epistaxis (n = 180)

Variable	Category	Frequency (N)	Percent (%)
Type of Epistaxis	Anterior	102	56.7
	Both	24	13.3
	Posterior	46	25.6
	Unknown	8	4.4
Laterality	Bilateral	59	32.8
	Left	54	30
	Right	67	37.2
Frequency of Episodes	First-time	132	73.3
	Recurrent	48	26.7
Cause of Epistaxis	Coagulopathy	28	15.6
	Foreign body	17	9.4
	Hypertension	23	12.8
	Idiopathic	24	13.3
	Infection	17	9.4
	Others	20	11.1
	Trauma	28	15.6
	Tumor	23	12.8
Comorbidity Presence	No	111	61.7
	Yes	69	38.3

Table 2 indicates that anterior epistaxis was the most common presentation, followed by posterior and combined anterior–posterior involvement. Most patients presented with their first episode. Trauma and coagulopathy were the most frequent identifiable causes, and comorbidities were present in over one-third of cases.

Table-3: Management Approaches and Treatment Outcomes for Epistaxis (n = 180)

Variable	Category	Frequency (N)	Percent (%)
Treatment Methods			
Initial Treatment Methods	Cauterization	36	20.0
	Medication	28	16.1
	Nasal Packing	81	45.0
	Surgery	34	18.9
Surgical Innervation Required	Yes	146	81.1
	No	34	18.9
Available ENT Specialist	Yes	154	85.6
	No	26	14.4
Outcome			
Rebleeding	Yes	45	25.0
	No	135	75.0
Final Outcome	Death	4	5.6
	Recovered	166	92.2
	Referred	10	5.6
Hospital Stay (in Days)	Mean ± SD (min–max)	3.51 ±1.67(1-6) Days	-

Table 3 shows that nasal packing was the most frequently used initial treatment, followed by cauterization and medication. Surgical intervention was required in less than one-fifth of cases. The majority of patients recovered, while rebleeding occurred in one-quarter of cases.

Table-4: Associations Between Clinical Variables and Treatment Outcomes in Epistaxis (n = 180)

Variable	Rebleeding p-value	Surgical Intervention p-value
Type of Epistaxis	0.035	0.022*
Comorbidity Presence	0.001	0.045*
Cause of Epistaxis	0.348	N/A
Initial Treatment Method	0.002	0.006*

Table 4 highlights statistically significant associations between type of epistaxis, comorbidity presence, and initial treatment method with both rebleeding and surgical intervention requirements ($p < 0.05$).

DISCUSSIONS

This study aimed to evaluate the pattern and management strategies of epistaxis in Bangladeshi tertiary care hospitals. Our findings underscore the predominance of anterior epistaxis (56.7%), with trauma and coagulopathy as leading causes. Nasal packing was the most common initial treatment (45.0%), and surgical interventions were required in roughly one-fifth of cases, with a rebleeding rate of 25%. These patterns largely align with regional and global data and reinforce the objective of understanding local epidemiology to inform targeted management.

Comparison with Other Bangladeshi Studies:

A study at Dhaka Medical College Hospital reported that among 104 patients with epistaxis, trauma accounted for 44%, idiopathic causes 25%, and hypertension 17%. Anterior nasal packing was used in 82.7%, with posterior packing in only 2.9% of cases. This underscores a strong reliance on conservative management, particularly in resource-limited settings, similar to our findings where packing was frequently employed and surgical intervention remained limited [11].

At Combined Military Hospital (Chattogram and Dhaka), the mean age was notably lower (~34 years), with anterior epistaxis in ~71% and 75.8% presenting with a first episode. The study also observed notable seasonal variations, with winter peaks information that our study's seasonal patterns may echo if similarly analyzed. [12]

Comparison with Regional and Global Findings:

In central Nepal, idiopathic causes accounted for 38.1% of epistaxis cases, followed by hypertension (27.4%), trauma (15.5%), and coagulopathy (8.3%). Anterior nasal packing was the most frequent treatment (52.4%), while only 2.4% required endoscopic arterial ligation [13] again mirroring our preference for packing and low surgical intervention rate.

A tertiary hospital in Western India reported hypertension (38%) and idiopathic bleeding (21%) as the most prominent factors, with anterior bleeding in 71%, managed primarily via non-surgical methods [14].

Internationally, an International ORL survey highlighted that nasal packing remains the most common first-line management globally, but cauterization is gaining favor for anterior bleeds due to cost-effectiveness and ease of skill transfer, especially in settings with limited specialist access [15].

Clinical Implications and Contextualization:

Our patient demographic (mean age ~46 years, slight female predominance, mostly rural patients) diverges somewhat from other studies that report younger or male-predominant populations[6]. These differences may reflect local environmental, occupational, and healthcare-seeking behavior patterns. Notably, our rebleeding rate (25%) is slightly higher than the ~17% pooled rebleed rate observed in studies of endovascular embolization, although the latter predominantly addressed refractory posterior bleeds and specialized interventions[7]. This emphasizes the need for broader access to advanced interventions and improved preventive strategies.

By detailing the local epidemiology, etiologic patterns, and treatment outcomes of epistaxis, our study directly supports the development of tailored clinical pathways and resource allocation in Bangladesh. The findings affirm that conservative methods, particularly nasal packing, remain integral yet also highlight the necessity of expanding access to cauterization, specialist care, and possibly interventional radiology or endoscopic techniques in complex cases. In doing so, our research contributes to improved patient outcomes, reduced resource burden, and informed healthcare policymaking in resource-limited ENT settings.

CONCLUSION

This study highlights that epistaxis remains a prevalent ENT emergency in Bangladeshi tertiary care hospitals, with anterior bleeding being the most common presentation and trauma, coagulopathy, and hypertension among the leading causes. The majority of cases were managed successfully with conservative approaches, particularly nasal packing, while surgical interventions

were required in a smaller proportion. The significant association between type of epistaxis, comorbidity status, and initial treatment method with rebleeding and surgical intervention underscores the importance of early assessment and individualized management. Strengthening the availability of advanced treatment modalities, improving specialist accessibility, and promoting preventive strategies could further reduce recurrence and improve patient outcomes in resource-limited settings.

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