

## RISK FACTORS, CLINICAL PROFILE, AND MANAGEMENT OF PATIENTS PRESENTING WITH EPISTAXIS: A CROSS-SECTIONAL STUDY

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Received: 11 November 2023, Revised and Accepted: 21 December 2023

### ABSTRACT

**Objective:** To analyze risk factors, clinical profile, and management strategies for patients presenting with epistaxis.

**Methods:** This was a cross-sectional study that was undertaken in the department of otorhinolaryngology at a tertiary care medical college. 60 adult patients presenting with epistaxis were included in this study. Demographic details, such as age and gender, were noted. Patients were evaluated for the presence of risk factors such as hypertension, bleeding disorder, or clotting defects. The clinical presentation of patients was also studied. Patients were managed as per standard protocol. Statistical analysis was done using SPSS 21.0 software, and  $p < 0.05$  was taken as statistically significant.

**Results:** There were 44 males (73.33%) and 16 females (26.67%) with a M: F ratio of 1:0.36. The mean age of male and female patients was found to be  $63.48 \pm 16.18$  and  $58.46 \pm 13.24$ , respectively. Assault or road traffic accidents, which were seen in 15 (25.00%) patients. The other common causes included hypertension (18.33%), nose picking (15%), and medication (such as antiplatelet or anticoagulant drugs)-induced (10%). Out of 60 patients, the majority (60.00%) were stable hemodynamically. 11 (18.33%) patients were found to have elevated blood pressure in addition to epistaxis. 5 (11.67%) patients were in hypotension, and hence fluid resuscitation was required. In 2 (3.33%) patients, the airway needed to be secured because of a compromised airway. The majority of the patients (75.00%) responded well to conservative measures. Posterior nasal packing (in addition to anterior nasal packing), cauterization, closed reduction of facial fractures, surgery for nasal mass, and functional endoscopic sinus surgery in remaining patients.

**Conclusion:** Facial trauma, hypertension, and nose picking were the most common causes of epistaxis. Majority of the patients were hemodynamically stable and could be treated conservatively with measures such as medical management and anterior nasal packing.

**Keywords:** Epistaxis, Facial trauma, Hypertension, Anterior nasal packing.

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### INTRODUCTION

Epistaxis is a common medical condition encountered by otorhinolaryngologists and other healthcare professionals alike. Though more commonly seen in elderly individuals (among adults), it can occur at all ages. In the majority of cases, the episodes of nosebleed or epistaxis are minor and self-limiting (usually secondary to nose picking), and hence, only a minority of patients seek consultation for these minor episodes of epistaxis [1]. The etiology of epistaxis is multifaceted and involves various causative factors, such as environmental, anatomical, and systemic factors. Understanding the pathophysiology of epistaxis is important for effective management as well as prevention. The nasal cavity is a highly vascularized and sensitive area and this vascularity makes it susceptible to bleeding episodes. The majority of nosebleeds originate from the anterior part of the nasal septum, an area richly supplied by the Kiesselbach plexus [2]. This plexus is a confluence of arteries, including the anterior ethmoidal, sphenopalatine, greater palatine, and superior labial arteries. Mechanical trauma, mucosal drying, inflammation, and alterations in blood flow can disrupt the delicate vascular structures, leading to bleeding episodes. Additionally, systemic conditions such as hypertension, bleeding disorders, clotting defects, and, in some cases, vascular anomalies may also be responsible for recurrent episodes of epistaxis [3].

Several risk factors increase the susceptibility of an individual to epistaxis. Environmental factors such as dry climate, exposure to irritants, and nasal trauma are some of the important and common causes of epistaxis [4]. Individuals living in arid regions often

experience nasal mucosal drying, making the blood vessels more prone to rupture. Moreover, occupational exposure to airborne irritants can also exacerbate nasal mucosal fragility [5]. Systemic medical conditions such as hypertension, bleeding disorders (thrombocytopenia, idiopathic thrombocytopenic purpura, and Henoch Schoenlein purpura), and clotting defects (such as hemophilia or von Willebrand disease) may cause recurrent and severe episodes of epistaxis. Vascular anomalies, such as Osler-Weber-Rendu syndrome, are some of the uncommon causes of recurrent epistaxis [6].

Clinically, epistaxis usually presents as sudden-onset nasal bleeding. The bleeding may range from mild to severe. Severe bleeding in epistaxis is a medical emergency and needs to be treated aggressively to prevent complications such as shock and airway compromise [7]. Persistent or recurrent bleeding may lead to anemia, impacting the patient's overall well-being. Therapeutic interventions often begin with conservative measures such as applying direct pressure, anterior nasal packing, and the use of topical hemostatic agents [8]. In addition, cauterization techniques, such as silver nitrate or electrocautery, may also be employed to control bleeding from identified sources. In the majority of cases, epistaxis responds to these conservative measures, and no further interventions are needed. However, in a small number of cases, further interventions such as posterior nasal packing, endoscopic management of bleeding points, ligation of feeding vessels, or embolization procedures may be required [9]. In addition to these interventions, it is also important to address the primary pathology responsible for epistaxis, such as control of blood pressure and correction of bleeding and clotting defects [10].

We undertook this cross-sectional study to analyze risk factors, clinical profiles, and management strategies for patients presenting with epistaxis.

**METHODS**

This was a cross-sectional study conducted in the department of otorhinolaryngology at a tertiary care medical institute. Sixty patients presenting with epistaxis were included in this study based on redefined inclusion and exclusion criteria. Patients were explained about the study, and informed and written consent was obtained from all the participants. The sample size was calculated on the basis of a pilot study done on the subject of the clinical profile of patients with epistaxis. Assuming 90% power and a 95% confidence interval and based on the central limit theorem, the sample size was determined to be enough if it was more than 55; thus, we included 60 patients in this study.

Demographic details such as age and gender were noted in all the cases. A detailed history was taken with respect to present as well as past episodes of epistaxis. Any history of similar episodes of epistaxis in other family members that would point out toward inherited bleeding or clotting disorders was also asked for. A personal history of systemic illnesses such as hypertension, diabetes, or any autoimmune disorders was also asked for and noted. At the outset, all patients were assessed for hemodynamic stability and saturation to rule out airway compromise. In the presence of hemodynamic instability or in cases of suspected airway compromise, immediate and appropriate steps were taken to treat shock and secure the airway. In stable cases examination of the ear, nose, and throat and a detailed general and systemic examination were done. Routine investigations such as complete blood count, bleeding time, clotting time, and blood grouping with cross-matching were done in all the cases.

Initially, all patients underwent conservative treatment. Surgical intervention was considered only in cases where conservative measures failed to control epistaxis. Non-surgical management consisted of cauterization of the bleeding site and the application of anterior nasal packing. Interventions such as posterior nasal packing, arterial ligation, open reduction, and internal fixation of facial bones in maxillofacial injuries were required only in a minority of cases. The criteria for successful treatment were defined as the absence of epistaxis after the removal of nasal packs for at least 24 h after hospital discharge.

SPSS 23.0 was used for data analysis. Descriptive statistics were given in the form of means and standard deviations for continuous variables, and frequencies and percentages for categorical variables. Group comparisons were made with the help of an independent sample t-test for continuously distributed data and a chi-square test for categorical data. Repeated observations were compared using a paired t-test or repeated measures analysis of variance, as applicable.  $p < 0.05$  was taken as statistically significant.

**Inclusion criteria**

1. Patients presenting with a nosebleed or epistaxis
2. Age above 18 years
3. Those who gave written and informed consent to be part of the study.

**Exclusion criteria**

1. Age: <18 years
2. Those who refused consent to be part of the study
3. Those who succumbed to serious epistaxis before the initial assessment.

**RESULTS**

In this study, a total of 60 patients were included. Out of 60 patients, there were 44 males (73.33%) and 16 females (26.67%), with a M: F ratio of 1:0.36 (Fig. 1).

The analysis of the patients on the basis of age groups showed that the most commonly affected age group among men as well as women was above 60 years of age. Increasing age was found to be associated with an increased incidence of epistaxis. The mean age of male and female patients was found to be  $63.48 \pm 16.18$  and  $58.46 \pm 13.24$ , respectively. The mean age of male and female patients was comparable, with no statistically significant difference ( $p = 0.2710$ ) (Table 1).

The analysis of patients on the basis of the etiology of epistaxis showed that the most common cause of epistaxis, particularly in individuals <60 years of age, was direct or external facial trauma as seen in assault or road traffic accidents, which was seen in 15 (25.00%) patients. The other common causes included hypertension (18.33%), nose picking (15%), and medication (such as antiplatelet or anticoagulant drugs)-induced hypertension (10%). In 6 (10%) cases no definitive cause or predisposing factor could be identified (idiopathic) (Fig. 2).

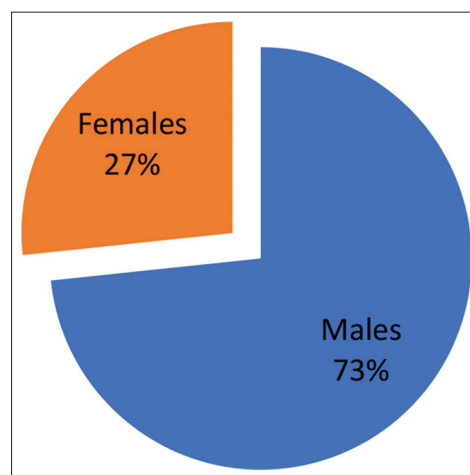


Fig. 1: Gender distribution of studied cases

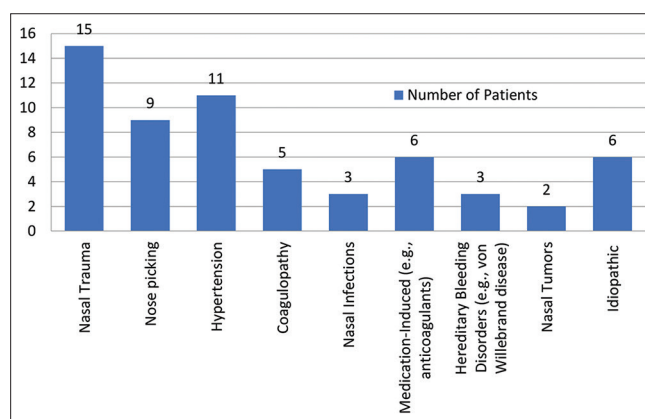


Fig. 2: Etiological profile of patients with epistaxis

Table 1: Gender wise age distribution of studied cases

Age group	Males		Females	
	No of patients	Percentage	No of patients	Percentage
18-30 years	2	3.33	0	0.00
31-40 years	3	5.00	1	1.67
41-50 years	7	11.67	1	1.67
51-60 years	12	20.00	6	10.00
>60 years	20	33.33	8	13.33
Total	44	73.33	16	26.67
Mean age (years)	$63.48 \pm 16.18$		$58.46 \pm 13.24$	

$p = 0.2710$  (Not significant)

Table 2: Age and gender wise distribution of etiological causes of epistaxis

Age and gender wise distribution of etiological cause	18-30 years		31-40 years		41-50 years		51-60 years		>60 years		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
Nasal trauma	0	0	0	0	1	0	3	2	6	3	10	5
Nose picking	1	0	1	1	1	0	0	0	2	3	5	4
Hypertension	0	0	0	0	2	1	1	1	6	0	9	2
Coagulopathy	0	0	1	0	1	0	1	0	2	0	5	0
Nasal infections	0	0	0	0	0	0	1	0	1	1	2	1
Medication-induced (e.g., anticoagulants)	0	0	1	0	1	0	2	1	1	0	5	1
Hereditary bleeding disorders (e.g., von Willebrand disease)	1	0	0	0	1	0	0	0	1	0	3	0
Nasal tumors	0	0	0	0	0	0	1	1	0	0	1	1
Idiopathic	0	0	0	0	0	0	3	1	1	1	4	2
Total	2	0	3	1	7	1	12	6	20	8	44	16

M: Male, F: Female

The analysis of patients on the basis of age and gender-wise distribution of etiological causes showed that in the 18-30 age group, only 2 (3.33%) were affected, and nose picking and hereditary bleeding disorder were the causes of bleeding in each case. Among patients between the ages of 31 and 40, nose picking was the most common cause, which was seen in 2 (3.33%) cases. Among 41-50 year olds, hypertension was the most common cause, which was seen in 3 (5%) cases, whereas among patients between 51 and 60 years old, nasal trauma (8.33%), followed by idiopathic epistaxis (6.67%) were the most common causes. Finally, in patients above 60 years of age, nasal trauma (15%), followed by hypertension (10%), was the most common cause of epistaxis (Table 2).

Out of 60 patients, the majority (60.00%) were stable hemodynamically, and there was no other feature other than nasal bleeding on arrival at the casualty. 11 (18.33%) patients were found to have elevated blood pressure in addition to epistaxis. 5 (11.67%) patients were in hypotension, and hence fluid resuscitation was required. In two patients, compromised airways were suspected secondary to severe bleeding, and hence, these patients were intubated. Both of these patients had epistaxis secondary to assault. On a computed tomography scan, nasal bone fractures were present in 4 (6.66%) cases. 2 (3.33%) patients presented with epistaxis as well as the presence of nasal mass (Fig. 3).

The majority of the patients (75.00%) responded well to conservative measures such as medical management (antihypertensives, stopping antiplatelet and anticoagulant medication), and anterior nasal packing. Posterior nasal packing (in addition to anterior nasal packing) was required in 4 (6.67%) patients, whereas cauterization was needed in 3 (5%) patients. Closed reduction of facial fractures was required in 3 (5%) patients. Surgery for nasal mass was done in 2 (3.33%) patients. Three (5%) patients required functional endoscopic sinus surgery. There was no mortality in any of the cases (Fig. 4).

## DISCUSSION

Epistaxis is one of the common causes for which ear, nose, and throat (ENT) consultations are sought. Epistaxis generally is of mild intensity and usually responds to conservative management; however, in some cases, it may be severe enough to cause hemodynamic instability such as hypotension and tachycardia, progressing toward shock if proper intervention is not done in time. Treating the underlying cause, such as hypertension, bleeding disorder, or coagulation defect, is as important as undertaking local measures such as anterior nasal packing or cauterization for control of bleeding [11].

In our study, out of 60 patients, there were 44 males (73.33%) and 16 females (26.67%), with a M: F ratio of 1:0.36. Though the exact cause of male predominance in the occurrence of epistaxis is not known, factors such as increased incidence of hypertension and trauma may at least be partly responsible for the propensity of men to develop epistaxis. Adoga *et al.* conducted a study to determine sociodemographic

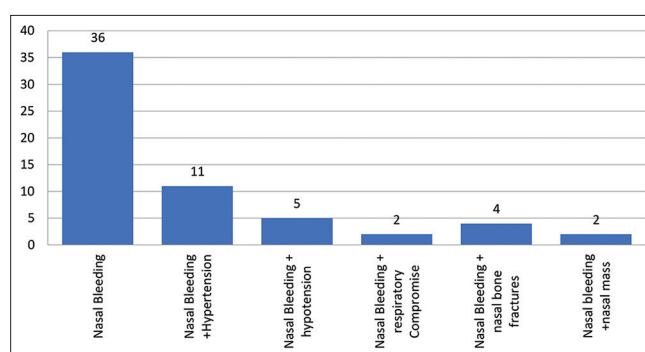


Fig. 3: Clinical presentation of the studied cases

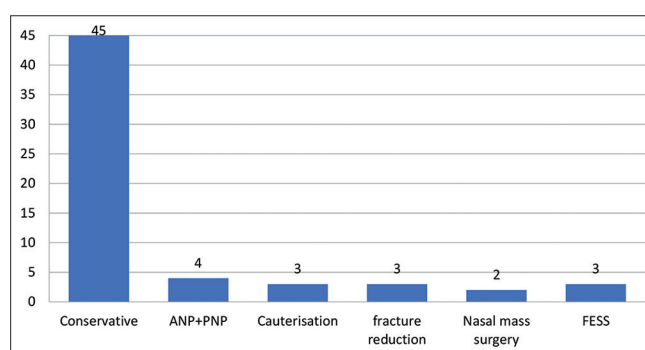


Fig. 4: Management of cases with epistaxis

characteristics, causes, treatment modalities, and predictors of patient outcome in cases of epistaxis [12]. In this study, there was a clear male preponderance, similar to ours. The study reported a M: F ratio of 2.3:1. Patients in the third decade were the largest group. The most common cause was idiopathic. Anterior nasal bleeding occurred in 51.1% and posterior nasal bleeding in 34.8%. Conservative management was effective at 84.8%. Etiological factors other than chronic liver disease and otolaryngological malignancies showed statistically significant associations with good patient outcomes ( $p=0.013$ ,  $p=0.044$ , and  $p=0.026$ , respectively). A mortality rate of 5.4% was recorded. Similar male preponderances were also reported by authors such as Hussain *et al.* [13] and Sharma *et al.* [14].

In our study, the mean age of male and female patients was found to be  $63.48 \pm 16.18$  and  $58.46 \pm 13.24$ , respectively. Increasing age is associated with an increased incidence of hypertension nasal tumors as well as a propensity to fall, causing traumatic epistaxis. In our study, the most common cause of epistaxis, particularly in individuals <60 years of age, was direct or external facial trauma, as seen in assault or road traffic accidents, which was seen in 15 (25.00%) patients. The

other common causes included hypertension (18.33%), nose picking (15%), and medication (such as antiplatelet or anticoagulant drugs)-induced hypertension (10%). In 6 (10%) cases, no definitive cause or predisposing factor could be identified (idiopathic). In the elderly population, nasal trauma and hypertension were the two most common causes of epistaxis. Yüksel *et al.* conducted a study to analyze the etiology, management, and accompanying disorders of epistaxis in geriatric patients by reviewing the literature [15]. For this purpose, the authors analyzed the data of 117 patients 65 years old and retrospectively reviewed. Records were evaluated for age, sex, accompanying disorders, drug medication, detailed otorhinolaryngological findings, and management of epistaxis. Here were 67 women (57.26%) and 50 men (42.74%), with a mean age of 73.51 years (range: 65–90). Ninety-four (80.34%) patients had accompanying disorders such as hypertension, diabetes mellitus, cerebrovascular disease, sinusitis, chronic obstructive lung disease, nasal polyps, and drug treatment. The bleeding site was anterior in 90 (76.92%) patients and posterior in 16 (13.67%). In 11 patients (9.4%), the bleeding site was not identified. Fifty-seven patients (48.71%) were treated with cauterization, 17 patients (14.52%) with nasal packing, 12 patients (10.25%) with medical treatment, 1 patient (0.85%) with mass excision and nasal packing, and 19 patients (16.23%) with more than 1 treatment method. Similar increased incidences of epistaxis have also been reported by authors such as Zhou *et al.* [16] and Pantanowitz [17].

Out of 60 patients, the majority (60.00%) were stable hemodynamically and there was no other feature other than nasal bleeding upon arrival at the casualty. 11 (18.33%) patients were found to have elevated blood pressure in addition to epistaxis. 5 (11.67%) patients were in hypotension, and hence fluid resuscitation was required. 2 (6.66%) patients required intubation because of compromised airways. The majority of the patients (75.00%) responded well to conservative measures. Posterior nasal packing (in addition to anterior nasal packing), cauterization, closed reduction of facial fractures, surgery for nasal mass, and functional endoscopic sinus surgery in remaining patients. Anie *et al.* conducted a study to find out the common etiological factors and the most common treatment modality in the management of epistaxis in our population [18]. For this purpose, a cross-sectional study on 110 patients aged 4–82 years was done. Details of the management of epistaxis in each patient were taken, and the data was analyzed statistically. The commonest cause of epistaxis was trauma (56.4%), followed by hypertension (11.8%) and infection of the sinuses (10.9%). Hypertension ( $p=0.0001$ ), coronary artery disease ( $p=0.013$ ), and chronic kidney disease ( $p=0.044$ ) were found to have significant associations. Non-surgical measures were the main intervention. Of the nonsurgical management, only medical management was needed in 69 cases (62.7%). The most common surgical intervention was open reduction and internal fixation of facial bones in maxillofacial injuries. Similar management strategies were also reported by the authors, such as Andersen *et al.* [19] and Awan *et al.* [20].

## CONCLUSION

Epistaxis is one of the common causes for which ENT consultations are sought. In this study, facial trauma, hypertension, and nose-picking were the most common causes of epistaxis. The majority of the patients remained hemodynamically stable and could be managed by medical management and measures such as anterior nasal packing. Posterior nasal packing (in addition to anterior nasal packing), cauterization, closed reduction of facial fractures, surgery for nasal mass, and functional endoscopic sinus surgery in remaining patients. It is also important to address the primary pathology responsible for epistaxis, such as control of blood pressure, and correction of bleeding, and clotting defects, in addition to local interventions undertaken to stop bleeding.

## FUNDING

None

## CONFLICT OF INTEREST

Nil.

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