Original Article

Prevalence of Epistaxis among Patients Receiving Otorhinolaryngology Services at Muhimbili National Hospital and Muhimbili Orthopedic Institute, Dar es Salaam, Tanzania

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ABSTRACT

Background: Epistaxis is the commonest ear, nose and throat emergency. It's mostly self-limited but it may be severe such that medical attention is sought and in such cases it may be life threatening. There is paucity of data on the prevalence and management options for epistaxis in Tanzania and at Muhimbili National Hospital (MNH) and Muhimbili Orthopedic Institute (MOI), no any published study has unveiled it despite being the commonly encountered emergency in our department. The aim of this study was thus to determine the prevalence, aetiology and treatment modalities of epistaxis among patients receiving otorhinolaryngology services at MNH and MOI.

Materials and Methods: A cross-sectional, hospital based study was done to 427 patients at Muhimbili National Hospital (MNH) and Muhimbili Orthopedic Institute (MOI). Data was collected using structured questionnaires from June to December 2015 and it was then analyzed using SPSS program.

Results: A total of 427 patients aged 1-82 years were recruited with majority of the patients being females (54.6%). The mean age at diagnosis was found to be 27±23 years.The prevalence of epistaxis was found to be lower among patients below 20 years (12.5%) of age and higher among patients over the age of 40years (34.9%). Prevalence of epistaxis was found to be higher among males (29.9%) compared to females (18 %). Majority of patients had anterior epistaxis (73%) whereas the remaining percentage was constituted by those with posterior epistaxis.Posterior epistaxis was more common among patients aged 21-40 years (40.7%) compared to patients aged 0-20 years (20%). 75% of the patients had epistaxis due to local etiologies while 25% was due systemic causes. Majority of patients with epistaxis had history of trauma (25%). Other reported aetiologies were malignancy of nasal and post-nasal space (22%) and hypertension (15%). Anterior nasal packing was the most commonly used method in management of patients with epistaxis compared to conventional posterior nasal packs. Fewer number of patients required surgery as the treatment modality where 3% of the patients undergone electro cauterization and only 1% required external carotid artery ligation.

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Conclusion: Epistaxis is quite prevalent at MNH and MOI with males being more affected than females. Trauma resulting from road traffic crashes remain the common etiological factor for epistaxis in our setting is the leading cause of epistaxis among the patients studied. Efforts directed at reduction in the incidence of road traffic crashes will reduce the prevalence of epistaxis in our hospital settings.

INTRODUCTION

Epistaxis is the commonest otorhinolaryngological emergency affecting about 60% of individuals in the population, with 6% of those with epistaxis seeking medical attention(1).In most settings it's self-limited though it can be severe enough and life threatening to warrant hospitalization and Otorhinolaryngologist review. Epistaxis can be classified as anterior or posterior, based on the site of bleeding site. Anterior epistaxis originate from Little's area while posterior epistaxis originate from Woodruff's plexus. Anterior epistaxis is more common than posterior epistaxis where it accounts for more than 80% of the cases(2,3).

Epistaxis has a bimodal distribution where the prevalence is higher in individuals less than 10 years of age and then it rises again after the age of 35 years. It has more affliction to males than females until the age of 50 where thereafter no sex difference exist (4).

Epistaxis can be due to local or systemic causes though there in about 10% of the cases, the cause of hypertension may not be evident thus assigned to be idiopathic(5,6). Age is one of the determinants for epistaxis where anterior epistaxis is more common in younger individuals and may be secondary to foreign bodies or nose picking whereas posterior epistaxis occurs markedly in older people. Epistaxis due to trauma is occurs in most occasions in younger individuals under the age of 35 whereas non traumatic epistaxis is reported in older individuals above the age of 50 years (4-8).

Anterior epistaxis pose no great challenge in identification because one sees blood coming readily from the nostril(s) but posterior epistaxis is much more challenging because one doesn't see blood coming out readily but rather the patient swallows blood and therefore its severity may be evident only upon deterioration of vital signs such as drop in blood pressure and other signs of shock(9). Posterior epistaxis in older people is worrisome because of their greater tendency for rapid deterioration in their clinical status(8).

Understanding the prevalence of epistaxis is of paramount importance because knowing its magnitude helps to lay efforts in our hospital settings so as to serve the victims. Understanding the aetiology and the available management options also is necessary if better welfare of patients seeking ear, nose and throat services is to be spearheaded. Such data is scarce in our settings and there is no any study from MNH and MOI that has unveiled it. The objective of this study was thus to determine the prevalence, types, aetiology and the available treatment modalities for epistaxis of which it will lay basis for planning of preventive strategies and establishment of comprehensive treatment guidelines.

METHODS

Study design and participants

This was a hospital based descriptive cross-sectional study and it was carried out between June and December 2015. It included patients seeking Otorhinolaryngology (ORL) services at MOI and MNH

Study population

The study population were patients attending ORL department at MNH and patients from MOI and other departments at MNH seeking ear, nose and throat (ENT) consultation due to epistaxis

Sampling methods

Convenience sampling technique was used in which selection based on most available sample. Patient who met the inclusion criteria were chosen provided they were available during data collection and they

were added up till the desired sample size was achieved.

Inclusion and exclusion criteria

Patients of all ages with active epistaxis or with history of epistaxis within one month during interview who consented to participate were included in the study and those who had nasal surgery and presented with epistaxis within 48 hours post-surgery were excluded.

Sample Size Calculation

The sample size, n was calculated from the following formula;

$$n = \frac{z^2 p(1-p)}{E^2}$$

z = 95% confidence interval, which is 1.96

E=Margin of error (taken to be 5% in this study)

p= Prevalence of epistaxis which was assumed to be 50% since no prevalence is available in Tanzania and East Africa in general

Therefore, from the above formula the adjusted sample size used was 427 patients after considering non response rate of 10%

Data collection methods

Data collection was done by the principal investigators and senior residents (residents in their second and third years of their training) using structured Swahili questionnaires. Age and sex of the study participants, type, etiology for epistaxis and the treatment modality executed to the patient.

Data analysis

Data analysis was done using the Statistical Package for Social Sciences (SPSS) version 21. Statistical association between age, sex, treatment modalities executed for epistaxis, type and etiology for epistaxis was done using cross tabulations. P value of <0.05 was considered statistically significant.

Ethical considerations

Patients were provided with an informed consent and then asked to provide written consent to participate in the study. For patients younger than 18 years, informed consent was obtained from their parents or guardians. This study was approved by the Research and Publication Committee of the Muhimbili University of Health and Allied Sciences (MUHAS).

RESULTS

Demographic characteristics of the study population

Between June and December 2015, a total of 427 patients were recruited from MNH and MOI. Out of 427 patients who were involved in the study, the proportion of females (54.57%) was higher than that of males (45.43%) in the ratio of 1:1.2. The study included patients aged from 1year to 82 years and the mean age was found to be 27±23 years. Majority of participants (38.4%) were aged between 0-10 years.

Table 1: Distribution of study participants by age and sex

	SEX		
Age group in years	Females (%)	Males (%)	Total (%)
0-10	107(45.9)	57(29.4)	164 (38.4)
11-20	22(9.4)	18(9.3)	40(9.4)
21-30	23(9.9)	19(9.8)	42(9.8)
31-40	21(9)	20(10.3)	41(9.6)
41-50	21(9)	31(16)	52(12.2)
51-60	28(12)	25(13)	53(12.4)
Above 60	11(4.7)	24(12.4)	35(8.2)
TOTAL	233(54.57)	194(45.43)	427(100)

Prevalence of epistaxis by sex

Prevalence of epistaxis among patients attending ORL department at MNH and MOI was 23.4%.

Prevalence of epistaxis among males was found to be 29.9% whereas among females was 18% and this was statistically significant with p-value 0.00210. Out of 100 patients with epistaxis, males (58%) were more affected than females (42%). Prevalence of epistaxis among males was higher (29.9%) compared to females (18 %).

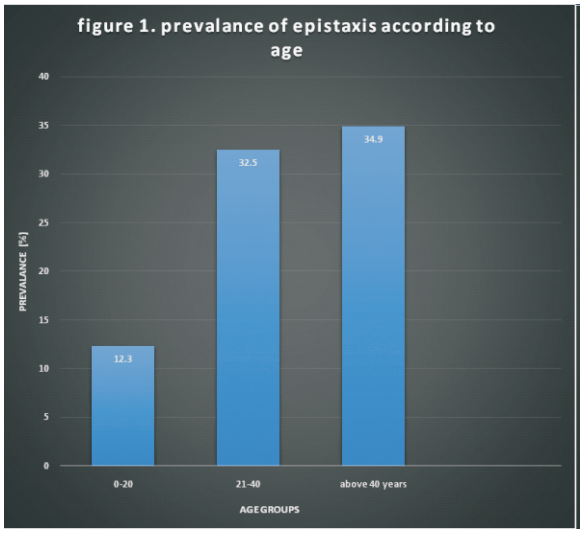
Table 2: Sex-specific prevalence of epistaxis among study participants

Sex	Epistaxis		Total (%)
	Yes (%)	No (%)	
Males	58 (29.9)	136 (70.1)	194 (100)
Females	42 (18)	191 (82)	233 (100)
TOTAL	100 (23.4)	327 (76.6)	427 (100)

Prevalence of epistaxis by age

The prevalence of epistaxis was lower among patients aged below 20 years (12.5%) and higher among patients above 40years (34.9%). Overall prevalence of epistaxis was found to be 23.4%

Figure 1: Prevalence of epistaxis among study participants by age



Type of epistaxis by age and sex

Majority of patients had anterior epistaxis (73%) while only 27% of patients had posterior epistaxis. Posterior epistaxis was more common among patients aged 21-40 years (40.7%) compared to patients aged 0-20years (20%). Anterior epistaxis was found to be predominant in both genders.

Table 3: Type of epistaxis among study participants with epistaxis by age and sex

Parameters		Type of epistaxis: Anterior	Posterior	Total
Age (yrs)	0-20	5(20%)	5(20%)	25(100%)
	21-40	16(59.3%)	11(40.7%)	27(100%)
	>40	37(77.1%)	11(22.9%)	48(100%)
Total		73(73%)	27(27%)	100(100%)
Sex	Males	36(62.1%)	22(37.9%)	58(100%)
	Females	37(88.1%)	5(11.9%)	42(100%)
Total		73(100%)	27(27%)	100(100%)

Etiology of epistaxis by age

Majority of patients with epistaxis had history of trauma (25%) and this was followed by **malignant tumors of the nasal and** post-nasal space (22%) and hypertension (15%). Traumatic epistaxis (44%) was common in patients aged 21-40 years compared to those aged 0-20 years.

Table 4: Etiology of epistaxis among study participants with epistaxis by age

	Age groups			
Causes of epistaxis	0-20 years (%)	21-40 years (%)	Above 40 years (%)	Total (%)
LOCAL CAUSES				
Septal varices	1 (4)	1 (3.7)	2 (4.2)	4 (4)
Benign nasal and post-nasal tumours	3 (12)	0 (0)	2 (4.2)	5 (5)
Malignant tumors of nasal and post-nasal space	3(12)	4(14.8)	15 (31.3)	22 (22)
Trauma	7 (28)	12(44.4)	6(12.5)	25 (25)
Septal deviation	0 (0)	0 (0)	2 (4.2)	2 (2)
Nasal infections/ Inflammatory conditions of the nose	4 (16)	2 (7.4)	4 (8.3)	10 (10)
SYSTEMIC CAUSES				
Hypertension/arteriosclerosis	0 (0)	2 (7.4)	13(27.1)	15 (15)
Typhoid fever	0 (0)	1 (3.7)	0 (0)	1(1)
NSAIDs	0 (0)	1 (3.7)	0 (0)	1(1)
Bleeding disorders	3 (12)	2 (18.5)	2 (4.2)	7(7)
Renal failure	0 (0)	1 (3.7)	0 (0)	1 (1)
IDIOPATHIC	4 (16)	1 (7)	2 (4.2)	7 (7)
TOTAL	25 (100)	27 (100)	48 (100)	100 (100)

Treatment modalities for epistaxis

More than half of patients with epistaxis were managed by anterior nasal packing (57%), while 15% of the patients had posterior nasal packs. Minority of patients required surgical interventions where 3% were managed by electro cauterization required and only 1% required external carotid artery ligation.

Table 5: Treatment modalities executed for epistaxis

Treatment	Epistaxis cases	Percentage
Medical treatment (N=100)	37	37
Anterior nasal packs (N=100)	57	57
Posterior nasal pack (N=100)	15	15
Silver nitrate cautery (N=100)	4	4
Artery ligation (N=100)	1	1
Electrocautery (N=100)	3	3

DISCUSSION

The aim of the study was to determine the prevalence, etiology and the various treatment modalities for epistaxis. Of all the 427 study participants, the overall prevalence of epistaxis was found to be 23.4%. Study done by Sanjay P Kishve et al showed the prevalence of epistaxis among pediatric patients with ear nose and throat disease to be 16 %(10). Therefore the difference in prevalence is due to the studied population where by Sanjay's study was focused on paediatric patients only while our study has included all age groups from paediatric patients to elderly people.

In this study, the prevalence of epistaxis among men was higher compared to women and this finding correlates with other studies as done by Saurabh et al, JaphetGilyoma et al, Peter A et al, Bhattacharya et al, Eziyeet al and Labaran et al (11-16). The male to female ratio was found to be 1.4:1 in this study.

Prevalence of epistaxis varies according age of the afflicted individuals. In this study, it was found that prevalence increase with age. This seems to be similar to other studies such as the study done by Saurabh et alwho found that prevalence of epistaxis is low below age of 10yrs (14). The highest prevalence was found among patients 40 years and above similar to other studies such as the study conducted by Peter et al(16).This may be due to the increase risk to certain factors with age such as hypertension and malignant tumors as one becomes older.

Anterior epistaxis was the commonest type of epistaxis encountered in this study accounting for 73% of cases. This finding is comparable to what was found in the study done by Bhattacharya et al where anterior epistaxis to account for 72% of the cases(11)

Etiology of epistaxis has been acceptably has been grouped to local and systemic causes. Our findings correlates with studies done by Bhattacharya et al , Peter A, Gilyoma et al (11,15,16), 68% of patients had epistaxis due to local causes while systemic cause contributed 25% of the cases of epistaxis. From this study, trauma (25%) was the leading cause of epistaxis followed by malignant tumors of the nasal and post-nasal space (22%). Bhattacharya et al also found trauma to be the leading cause of epistaxis followed by hypertension and nasal infections(11). There is controversy regarding hypertension as one of the direct cause of epistaxis, some literaturesconsider hypertension to be an indirect cause of epistaxis and thus increasing severity of epistaxis. In this study, 15% of patients with epistaxis had hypertension. Gilyoma et al and Bhattacharya et al also found similar findings(11,15). Malignant tumors of the sinuses, nasal cavity and nasopharynx are considered to be one of the etiological factors responsible for epistaxis and from our study, 22% of patients with epistaxis had such malignancies. Similarly, several other studies reported such malignant tumors to be involved in epistaxis causation for example, Gilyoma et al and Peter et al foundthese tumours to contribute by 4.8% and 16% respectively. These differences could be due to differences in geographical distribution of the responsible risk factors and this warrant further studies.

More than half of all cases of epistaxis(57%) were managed by anterior nasal packing, this correlates to the study done by Peteret al (16). Materials used for anterior nasal packing were the traditional Vaseline gauze which seems uncomfortable to both patients and clinicians. No any patient had an opportunity to be packed using special nasal packs such as merocel. This calls the need to upgrade our inventory at all level of procurement in order to make merocel packs available. From our study, posterior nasal packing was less commonly applied and this is due to the fact that posterior epistaxis was less common compared to anterior epistaxis which was the most commonly encountered type of epistaxis in our study. Foley Catheters were materials used for posterior nasal packing and these findings appears to be similar to what has been observed by Bhattacharya et al (11). 37% of patients with epistaxis from our study were managed by medical treatment such as antibiotics and steroid nasal spray coupled with blood transfusion. Very few patient required surgical management of epistaxis. Surgery as one of the treatment modalities for epistaxiswas less commonly practiced from our study where, only 1% of patients with epistaxis had external carotid artery ligation done and similarly, Bhattacharya et al found 2% of patients from their study to be managed by similar modality of carotid artery ligation (11). The most recent and safer method is selective embolization of specific bleeding vessels instead of arterial ligation and from our study, no patient was treated by embolization, because no failure of other treatment modalities was encountered. Similarly, Bhattacharya reported no patient who was treatment by selective embolization. Embolization techniques are of importance in management of refractory epistaxis which may be due to vascular tumours of nose and postnasal space such as juvenile nasopharyngeal angiofibromaas it has been well demonstrated by Bhattacharya(11). Chemical cauterization using topical silver nitrate in management of septal varices as one of the etiologies of epistaxis is still the most commonly applied treatment worldwide, such observation has also been found in our study where 4% of patients with epistaxis were managed by chemical cauterization using silver nitrate, this appears to be similar to what has been found by Bhattacharya et al(6%)and Peter et al(2%) (11,16).

CONCLUSION

Epistaxis is quite prevalent in our local settings and this calls an attention towards preparedness in management of such patients. Trauma due to road traffic accidents remains the most common etiological factor for epistaxis in our setting. Most cases were successfully managed non-surgically such as through nasal packing and chemical cauterization. Non-surgical treatment remains to be useful in arresting epistaxis. Nose packing is still safe, easily executed by health personnel and cost-effective. Surgical intervention should be the last resort upon failure of the other available options. Efforts directed at reducing the incidence of trauma from road traffic accidents will reduce the incidence of emergency epistaxis at MNH and MOI.

LIST OF ABBREVIATIONS

ENT: Ear, Nose and Throat ORL: Otorhinolaryngology

SPSS: Statistical Package for Social Sciences

MNH: Muhimbili National Hospital

MOI: Muhimbili Orthopedic Institute

MUHAS: Muhimbili University of Health and Allied Sciences

DECLARATIONS

Ethics approval and consent to participate

The approval to conduct the study was granted by Ethics and Research Committee for Muhimbili University of Health and Allied Sciences

Consent for publication

A written informed consent from the study participants/guardians was sought for data collection and possible publishing of the results after analysis for the sake of dissemination.

Availability of data and material

The detailed reported information can be obtained from the corresponding authors when needed and from archives of the department of otorhinolaryngology-MUHAS

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

ZAS participated in preparation of the manuscript. AC participated in study design, data collection and analysis. EN: Participated in design of the study and data analysis. DN participated in design of the study. EL participated in design of the study and review of the analyzed study findings

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