ORIGINAL ARTICLE

AL-ANBAR MEDICAL JOURNAL
Anb. Med. J. xx(x): xx–xx, 2024

Prevalence and Clinical Profile of Epistaxis at a Private Otolaryngology Clinic, Ramadi City, Iraq

Raid M. Al-Ani*
Department of Surgery/Otolaryngology, College of Medicine, University of Anbar, Anbar, Iraq.
(Received : 24 August 2023; Accepted : 20 November 2023; First published online: 17 January 2024)

ABSTRACT

Background: Epistaxis is a common condition in daily clinical practice and is presented either in emergency units or outpatient otolaryngology clinic. There is no relevant local study regarding its prevalence and clinical profile.
Objectives: To estimate the prevalence and demographic and clinical profile of patients with epistaxis.
Materials and methods: We prospectively reviewed the patients with epistaxis during the year 2021. Detailed information regarding every subject's demographic and clinical aspects was registered and analyzed.
Results: Of the 6645 patients visiting the private clinic, 344 (5.2%) had epistaxis. The highest proportion of patients was registered in June (12.5%). There were 53.5% males, 48.3% from the age group 11–18 years, and 80.02% lived inside the city. Around 60% were presented within 1–2 days from the bleeding onset. Unilateral epistaxis was seen in 74.4% of the cases (143 from the right and 113 from the left side). The majority of bleeding was from the anterior part (97.1%) and with mild form (96.5%). About 80% of the subjects had recurrent attacks of epistaxis. Early presentation (1–2 days) was seen more in the age group $>$ 50 years (9/12), bleeding from the posterior part (10/10), severe epistaxis (11/12), patients with the first attack of bleeding (77%), and with idiopathic (19.77%) cause (P-value $<$ 0.05). The majority of the cases (84.3%) were treated conservatively.
Conclusion: The prevalence of epistaxis was 5.2%. June registered the highest cases of bleeding. The age group of 11–18 years and males were mostly affected. The age, site, severity, cause, and patient with the first attack were significantly affected the presentation time. Conservative treatment was effective in the majority of cases.
Keywords: Epistaxis; Prevalence; Otolaryngology clinic.

DOI: 10.33091/amj.2023.142880.1345

INTRODUCTION

Epistaxis is defined as bleeding from the nose. It is considered one of the frequent reasons for consulting the otolaryngology departments, whether in the emergency unit or outpatient clinic. There is a prevalence rate of at least one attack of epistaxis in human life in around 60% of the population. However, only 6% of them are seeking medical care [1].

Epistaxis can occur at any age; however, there is usually a bimodal age distribution, first in children less than 10 years old and second above the age of 50 years [2]. It occurs either spontaneously in most of the cases (70%) or, less commonly, due to local (trauma, infection, septal deviation, allergic rhinitis, sinonasal neoplasms, etc.) or systemic (like hypertension and coagulopathy) causes [3]. In the majority of cases, epistaxis comes from the anterior part of the nose, particularly the Little's area. Posterior epistaxis accounts for only 5–10% of all cases. Recently, superior epistaxis has been found in a significant number of patients with severe nose bleeding [4]. Conservative management is all that is required for the majority of anterior bleeding, while admission, blood transfusion, posterior packing, and surgical artery ligation or embolization are required in certain cases of posterior epistaxis [5]. Previous investigations have reported that around 0.5% of bleeding needed to be seen in the causality unit, but only 0.2% of the

*Corresponding author: E-mail:med.raed.alani2003@uoanbar.edu.iq

cases have required admission to a hospital [3].

It is of utmost importance to know the prevalence of epistaxis to assist the hospital in providing the optimum care to the attending patients. Besides, understanding the demographic and clinical profile of subjects with epistaxis is essential in determining the best treatment options for each patient. Moreover, there is no relevant local study in Iraq that estimates the prevalence of epistaxis. Hence, we conducted this study to determine the prevalence and demographic and clinical characteristics among patients attending a private Otolaryngology Clinic, in Ramadi City, Iraq.

MATERIALS AND METHODS

This prospective cross-sectional study was conducted at a private Otolaryngology clinic, in Ramadi City, Iraq. The study period covered the whole 2021 year. We enrolled every subject with epistaxis who accepted the study protocol and was seen at the Otolaryngology clinic in the current study. Patients or their caregivers who did not wish to participate in the study, subjects with previous sinonasal surgeries in the last 3 weeks, and those who lost follow-up were excluded from the study. Informed consent was obtained from every patient or his or her caregiver. The protocol of the study was approved by the Ethical Approval Committee of the University of Anbar (reference number 1, on 5-1-2021).

Detailed information concerning the demographic (age, gender, and residence) and clinical [duration, side, site, recurrence (recurrent epistaxis is defined as a repeated attack/s more than three months after the nose bleed treatment [6], and the severity of the epistaxis, history of recent mid-facial trauma, sinonasal surgeries, anticoagulants or bleeding disorders, and past medical history] characteristics were registered for every participant. The age of the enrolled subjects was divided into four groups; $\leq$ 10, 11–18, 19–50, and $>$ 50 years. A routine nasal examination was carried out by anterior rhinoscopy, fibro-optic, or rigid endoscopy on every subject to detect the site of the bleeding. Systemic examination, laboratory investigations, imaging studies such as computerized tomography (CT) scans, and magnetic resonance imaging (MRI), and biopsy were performed when the patient required some or all of them.

Treatment of the patients depends on the condition: either conservative treatment [avoidance of dryness or excessive rubbing of the nose, moistening (steam inhalation or normal saline sprays), antibiotics, antihistamine, etc.], or intervention (cauterization, anterior packing, posterior packing, septoplasty, etc.). Patients with severe epistaxis were admitted to the Al-Ramadi Teaching Hospital for resuscitation, further management, and follow-up.

SPSS (Statistical Package for the Social Sciences) version 25 was used to analyze the data. We summarized continuous variables as mean, median, and mode with standard deviation and categorical variables as absolute numbers and percentages. The data were presented in simple figures or tables. A Chi-square test was used to compare the variables. A P-value of less than 0.05 was considered a statistically significant difference.

RESULTS

Out of 6645, 366 patients presented with epistaxis. Twenty-two cases were excluded (1 postoperative bleeding, 15 declined to participate, and 6 lost to follow-up) and the remaining study sample was 344, which comprises 5.2% of the total patients attending the outpatient clinic (Figure 1). The highest

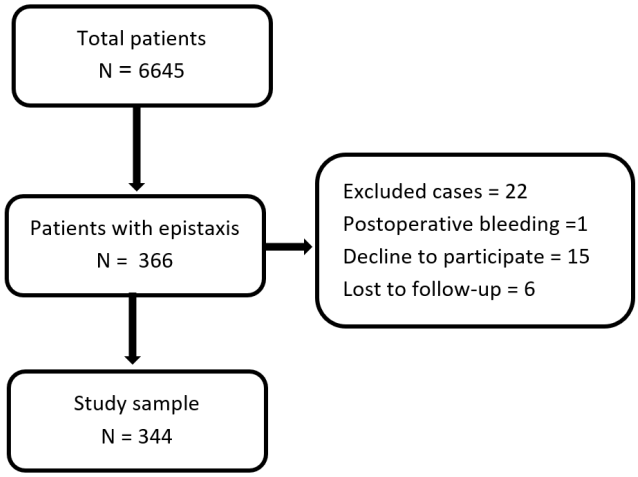

Figure 1. Flow chart of the studied patients.

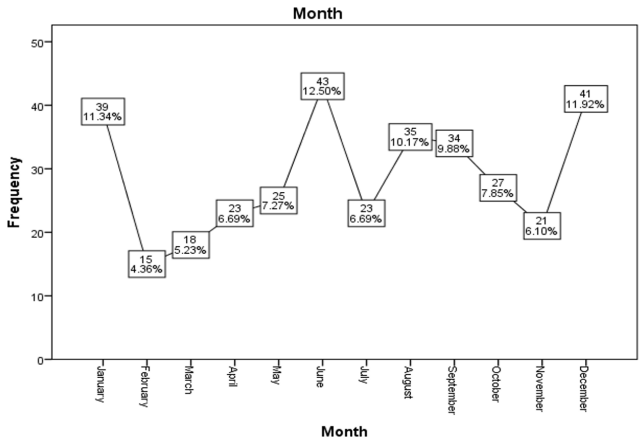

Figure 2. The frequency and percentage of the 344 patients with epistaxis according to the months (P-value $<$ 0.0001).

prevalence of epistaxis was seen in June (n = 43, 12.5%) and the least in February (n = 15, 4.36%) (P-value$<$0.0001) (Figure 2). The highest number of cases was seen in the Summer (n = 101, 27.62%) and the least in the Spring season (n = 66, 19.19%) (P-value = 0.039) (Figure 3).

The age of the subjects ranged from 1–78 years, with a mean age of 18.08 $\pm$ 15.118 years. While the median and mode were 13 and 12 years, respectively. The highest age group affected was 11-18 years (n = 166, 48.3%). There were 184 (53.5%) males. The majority of the subjects were from inside Ramadi city (n = 276, 80.02%) (Table 1).

The mean duration of epistaxis was 2.67 $\pm$ 2.111 days (range 1–15 days). There were 206 (59.9%) patients who presented within 1-2 days following epistaxis. Most of the bleeding came from one side [143 (41.6%) from the right side and 113 (32.8%) from the left]. The vast majority of epistaxis was from the anterior part of the nose (n = 334, 97.1%), mild type (n = 332, 96.5%), and recurrent attacks of bleeding (n = 270, 78.5%) (Table 2). There were statistically significant differences between the duration of epistaxis and the age, site, severity of bleeding, and recurrent attacks (P-value $<$ 0.05). There was no significant difference between the duration and

http://doi.org/10.33091/amj.2023.142880.1345

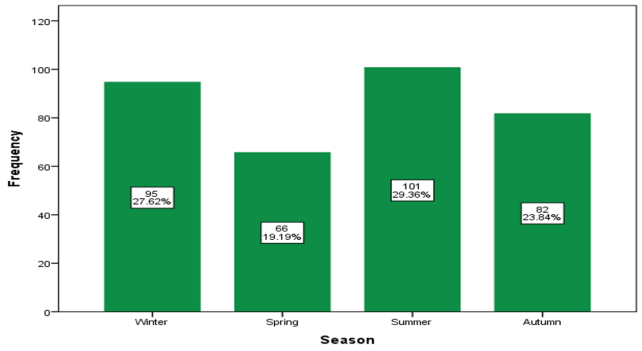

Figure 3. The frequency and percentage of the 344 patients with epistaxis according to the seasons (P-value = 0.0039).

Table 1. Demographic characteristics of the 344 patients with epistaxis.

Variables	Frequency	Percent
Age per years		
0–10	133	38.7
11–18	166	48.3
19–50	33	9.6
> 50	12	3.5
Gender		
Males	184	53.5
Females	160	46.5
Residence		
Inside city	276	80.2
Outside city	68	19.8

Table 2. Clinical characteristics of the 344 patients with epistaxis.

Variables	Frequency	Percent
Duration per days		
1–2	206	59.9
> 2	138	40.1
Side		
Right	143	41.6
Left	113	32.8
Bilateral	88	25.6
Site		
Anterior	334	97.1
Posterior	10	2.9
Severity		
Mild	332	96.5
Severe	12	3.5
AttackFirst attack	74	21.5
Recurrent	270	78.5

the gender, residence, or side of the bleeding (P-value > 0.05) (Table 3).

The highest number of patients were had unidentifiable cause of epistaxis (68 of them presented within 1–2 and 57 after 2 days). While the least common cause was hypertension in 2 patients, both of them presented within 1–2 days. There was a statistically significant difference between the cause and duration of the epistaxis (P-value < 0.0001) (Figure 4).

The majority of the patients were treated conservatively (n = 290, 84.3%). While posterior packs and endoscopic surgery were used least in the treatment of epistaxis (n = 4, 1.2% for each modality) (Table 4).

Table 3. The relationship between the duration of epistaxis and the demographic and clinical characteristics of the 344 patients.

Variables	Duration per days 1–2 (N=206) N (%)	Duration per days >2 (N=138) N (%)	Total (344) N (%)	P-value
Age groups per years				0.011
0–10	92 (69.2)	41 (30.8)	133 (100)	
11–18	85 (51.2)	81 (48.8)	166 (100)	
19–50	20 (60.6)	13 (39.4)	33 (100)	
> 50	9 (75)	3 (25)	12 (100)	
Gender				0.535
Male	113 (61.4)	71 (38.6)	184 (100)	
Female	93 (58.1)	67 (41.9)	160 (100)	
Residence				0.452
Inside city	168 (60.9)	108 (39.1)	276 (100)	
Outside city	38 (55.9)	30 (44.1)	68 (100)	
Side				0.235
Right	93 (65)	50 (35)	143 (100)	
Left	62 (54.9)	51 (45.1)	113 (100)	
Bilateral	51 (58)	37 (42)	88 (100)	
Site				0.009
Anterior	196 (58.7)	138 (41.3)	334 (100)	
Posterior	10 (100)	0 (0)	10 (100)	
Severity				0.022
Mild	195 (58.7)	137 (41.3)	332 (100)	
Severe	11 (91.7)	1 (8.3)	12 (100)	
Attack				0.001
First	57 (77)	17 (23)	74 (100)	
Recurrent	149 (55.2)	121 (44.8)	270 (100)	

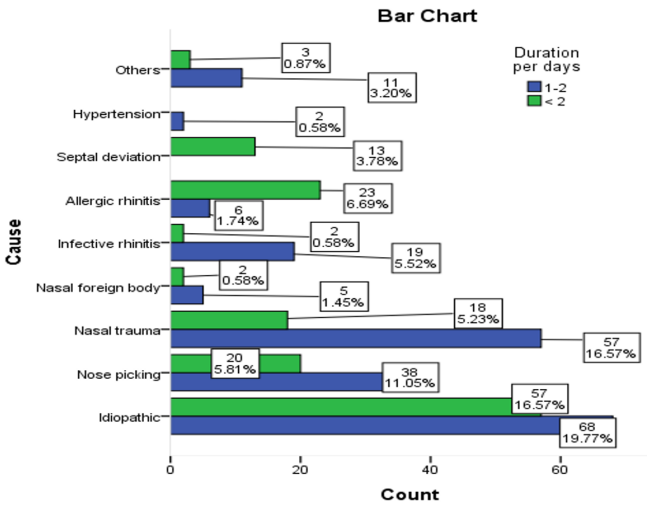

Figure 4. The relationship between the duration and cause of epistaxis in 344 patients (P-value < 0.0001).

Table 4. Treatment of the epistaxis in 344 patients.

Treatment	Frequency	Percent
Conservative	290	84.3
Cauterization	28	8.1
Septoplasty	11	3.2
Anterior pack	7	2.0
Posterior packs	4	1.2
Endoscopic surgery	4	1.2

DISCUSSION

Epistaxis is one of the common reasons for consulting the Otolaryngology clinic and admission to the emergency unit, both in children and adults [7]. The majority of the epistaxis cases are seen in the outpatient clinic, 0.5% of the cases are admitted to the emergency units, and 0.2% require admission to the hospital [8]. The main outcomes of the present study were epistaxis with a 5.2% prevalence rate, a slight male preponderance, and around 50% of cases seen in the age group 11–18 years. Most of the cases had mild epistaxis and were treated conservatively.

Epistaxis is a common symptom, and 60% of the population will have an attack of a nosebleed at certain times in their lives [9]. A recent survey study from Ethiopia on pre-college students found that out of 387 participants, there were 108 (27.9%) who gave a history of epistaxis [10]. Other studies conducted in Saudi Arabia, Tanzania, and India, reported a level of epistaxis of 49%, 23.4%, and 7.5%, respectively [11–13]. The present study found a lower prevalence of epistaxis (5.2%) than the above-mentioned studies. The variation between these studies may be related to the sampling method of the population, hospital, institution, or outpatient clinic. Several investigations studied epistaxis cases from hospitals [11, 13] but the majority of cases are self-limited [11], and only a few patients are seeking medical advice [12, 14]. Therefore, patients with epistaxis are visiting the health care center, outpatient clinic, and hospital on rare occasions. However, contrary to our findings, other researchers reported that 66.6% of their patients were admitted into the hospital ward, with 31.3% staying for 4 to 7 days on admission [15].

Many investigations reported seasonal variations in the prevalence rates of epistaxis. The peak prevalence of epistaxis had been reported in the Winter months by several investigations [8, 16]. However, other studies showed that the peak was in the Spring [17] or that there was no such variation [18]. The current study reported a high prevalence of epistaxis cases in June, December, and January (P-value > 0.0001). Besides, the study reported a high prevalence of epistaxis in the Summer (101/344) and Winter (95/344) seasons (P-value $= 0.039$). The humidity change in the Winter months results in a dry environment, causing dryness of the nasal mucosa, particularly in Little's area. The dryness may be responsible for epistaxis. Besides, the increase in the prevalence of upper respiratory tract infections in the Winter is considered another risk factor for epistaxis. Anyhow, there are different effects of the season in various geographical locations [18].

There are various studies with different results regarding the age of the patients with epistaxis. Pallin et al. reported a bimodal age presentation (less than 10 years and more than 70 years) [19]. Another study from Brazil found a bimodal age distribution (11–20 years and 51–70 years) [20]. Some researchers said that epistaxis is more common in the middle age group [18]. A recent study from Germany reported that the majority of cases with pediatric nosebleeds were in the age group 10-17 years (38/60) [21]. The current study found that the majority of the cases were in children, with around 50% in the age group 11-18 years. Therefore, epistaxis can occur at any age.

The present study supports many previous studies in that epistaxis is more common in males than females [20–23]. This may be attributed to the fact the female hormone (estrogen) has a protective effect on the vasculature of the nose [24]. The second possible cause is that males have more outdoor activities than females, therefore, they are more susceptible to nasal trauma.

Several studies have said that unilateral epistaxis is more common than bilateral epistaxis and the right side is more common than the left [12, 18]. The current study found a similar finding. These results might explain why many idiopathic epistaxis cases are due to local nasal causes [18]. The predominance of right-sided epistaxis might be due to the fact that most of the population is right-handed, which might result in nose-picking in the right anterior part of the nose (Little's area).

It was reported in the literature that anterior epistaxis is more common than posterior. Send et al. reported that anterior epistaxis was encountered in 76.7% of their cases [21]. Another study from Germany also reported that anterior epistaxis (85%) was more prevalent than posterior (13%) [25]. Our study revealed that the vast majority of the cases were had anterior epistaxis (97.1%). The relatively high prevalence of anterior epistaxis in the current study in comparison with the previous two studies may be attributed to the difference in the study design (clinic-based in our study *vs.* hospital -based in the previous two mentioned studies).

There is a belief that in 85% of the cases of epistaxis, there is no identifiable cause [26]. Contrary to this belief, our study and several others reported that there is a proven cause of epistaxis in considerable percentages of their studied sample [12, 25, 27].

The results of the current study are consistent with several previous studies in that patients with recurrent epistaxis are more common than a single episode in attending the outpatient clinic or causality unit [9, 12]. Of note, only 10 percent of patients with recurrent epistaxis get advice about simple first measures for controlling and preventing bleeding. This may reflect the lack of knowledge among the general population regarding the first aid measures for nose bleeds (sit upright and lean forward, gently blow your nose, and pinch the nose with the thumb and index fingers for 10–15 minutes) [22]. Despite the majority of epistaxis cases being handled and referred by primary care doctors, they have little knowledge of epistaxis treatment. Besides, junior doctors are first dealing with the majority of cases in which they have low confidence and knowledge [28]. These two factors take too much from hospital resources without great benefit to the patients. Therefore, the improvement in the training programme of the dealing doctors concerning the first aid measures for nose bleeds is of utmost importance to reduce morbidity and unnecessary visits to the hospital.

Colonization of the nose with Staphylococcus aureus in children with epistaxis is suggested because there is an improvement in the bleeding state with local treatment with antistaphylococcal creams, not by simple emollient cream alone. Staphylococcus aureus is also colonized in the nose in adult

http://doi.org/10.33091/amj.2023.142880.1345

with a habit of nose picking, therefore, those can benefit from antistaphylococcal creams [29]. A study by Ulusoy et al. reported that the patients with recurrent epistaxis group had significantly higher Staphylococcus aureus colonization in their nasal cavity than the control group [30]. Therefore, it is logical to see a high number of patients with recurrent epistaxis improve with conservative treatment, including antistaphylococcal creams. Many previous studies reported considerable cases of epistaxis response to conservative treatment [12, 21, 22]. The present study found that 84.3% of the cases responded to conservative treatmeent.

Epistaxis is a nuisance symptom; therefore, their patients may have been presented earlier. However, there are several factors that might delay its presentation. Simple recurrent nosebleeds that the sufferers and their relatives have experienced, even if simple, in dealing with epistaxis attacks may delay the patient's arrival to seek medical help. Poverty, when the patient's residence is far away from the most qualified health services, and the lack of appropriate means of transportation may make patients obtain medical care from places close to their homes. Blood stained nasal discharge accompanies the nasal foreign body; rhinoliths, and tumors might also delay the patients presentation. Besides, habitual epistaxis due to nasal anatomical abnormalities like septal deviation and chronic diseases like allergic rhinitis and septal perforation may be responsible for late presentation. Although the majority of our patients came early (within the first 2 days), there was a considerable number (138/344) of cases where they were seeking advice relatively late ($>$ 2 days). Moreover, the study found that older age, posterior bleeding, severe attack, first attack, and patients with nasal trauma or hypertension were coming early (P-value < 0.05).

The limitation of the current study is that it focuses on one ear, nose, and throat (ENT) clinic in Ramadi city and does not take into consideration other patients who are seeking advice in other ENT clinics, Al-Ramadi Teaching Hospital, or health care centers in the city. This affects the sample size and results of the demographic and clinical profiles of the patients with a nosebleed.

CONCLUSION

The study reported a prevalence of epistaxis of 5.2% among patients visiting the outpatient otolaryngology clinic. There was a slight male preponderance, with about half of the cases being in the age group of 11–18 years. There was a high proportion of cases in the Summer and Winter seasons. Around 40% of the cases were without identifying the cause. The majority of cases were unilateral, anterior, mild, recurrent epistaxis, and presented within the first 2 days of the episodes. The early presentation showed a significant association with the cause, site, recurrent attacks, age of the patients, and severity of epistaxis.

ETHICAL DECLARATIONS

Acknoweldgements

None.

Ethics Approval and Consent to Participate

Written approval had been gained from the Ethical Approval Committee at the University of Anbar, Iraq (reference number 1, on 5-1-2021). Study data/information were used for the research purpose only. Informed consent was obtained from every participant.

Consent for Publication

Not applicable (no individual personal data included).

Availability of Data and Material

Data generated during this study are available from the corresponding author upon reasonable request.

Competing Interests

The author declares that there is no conflict of interest.

Funding

No funding.

Authors' Contributions

Al-Ani RM designed the study, collected the data, wrote the introduction and methodology sections and searched the related published studies. Al-Ani RM made the analysis and he was the only contributor in writing the manuscript. Al-Ani RM read and approved the final manuscript.

REFERENCES

[1] Hai-Yan Li, Ting Luo, Liang Li, Ying Liu, Xiang Zhai, and Xu-Dong Wang. Etiology and clinical characteristics of primary epistaxis. *Annals of Translational Medicine*, 11(2), 2023.

[2] Desiderio Passali *et al.* An International Survey on the pragmatic management of epistaxis. *Acta Bio Medica: Atenei Parmensis*, 91(Suppl 1):5, 2020.

[3] Nathan P Christensen, Dana S Smith, Stanley L Barnwell, and Mark K Wax. Arterial embolization in the management of posterior epistaxis. *OtolaryngologyHead and Neck Surgery*, 133(5):748–753, 2005.

[4] Raid M Al-Ani. Importance of S-point in the Management of Severe Epistaxis. *Al-Kindy College Medical Journal*, 19(1):11–14, 2023.

[5] Sarah E Cooper and Vijay R Ramakrishnan. Direct cauterization of the nasal septal artery for epistaxis. *The Laryngoscope*, 122(4):738–740, 2012.

[6] Hayoung Byun, Jae Ho Chung, Seung Hwan Lee, Jiin Ryu, Changsun Kim, and Jeong-Hun Shin. Association of Hypertension With the Risk and Severity of Epistaxis. *JAMA OtolaryngologyHead & Neck Surgery*, 147(1):34–40, 2021.

[7] Katharine E L Hamlett, May M C Yaneza, and Natasha Grimmond. Epistaxis. *Surgery (Oxford)*, 39(9):577–590, 2021.

[8] Mohamad R Chaaban, Dong Zhang, Vicente Resto, and James S Goodwin. Demographic, seasonal, and geographic differences in emergency department visits

for epistaxis. *OtolaryngologyHead and Neck Surgery*, 156(1):81–86, 2017.

[9] Mohsen Saleh ElAlfy, Azaa Abdel Gawad Tantawy, Badr Eldin Mostafa Badr Eldin, Mohamed Amin Mekawy, Yasmeen Abd elAziz Mohammad, and Fatma Soliman Elsayed Ebeid. Epistaxis in a Pediatric Outpatient Clinic: Could It be an Alarming Sign? *International Archives of Otorhinolaryngology*, 26:e183–e190, 2021.

[10] Gemechu Ameya *et al.* Epistaxis and Its Associated Factors Among Precollege Students in Southern Ethiopia. *Journal of blood medicine*, 12:1, 2021.

[11] Mohammed Sami Alhaddad, Khaled Almulhim, Ibrahim Al Sheikh Mubarak, Nasser Alotaibi, Marwan AlShaikh Hussain, and Khalid A Alyahya. Prevalence of epistaxis in saudi population. *Int J Sci Study*, 5(9):96–99, 2017.

[12] Japhet M Gilyoma and Phillipo L Chalya. Etiological profile and treatment outcome of epistaxis at a tertiary care hospital in Northwestern Tanzania: a prospective review of 104 cases. *BMC ear, Nose and throat Disorders*, 11(1):1–6, 2011.

[13] Niru Moran and Debajit Das. Epistaxisincidence, etiology, and management: A hospital-based study. *Clin Rhinology*, 9(1):18–20, 2016.

[14] Jennifer A Villwock and Kristin Jones. Recent trends in epistaxis management in the United States: 2008-2010. *JAMA OtolaryngologyHead & Neck Surgery*, 139(12):1279–1284, 2013.

[15] A Ajiya, A Adamu, and I Y Shuaibu. Clinical and Laboratory Profile of Patients with Epistaxis in Kano, Nigeria: A 10year Retrospective Review. *Nigerian journal of clinical practice*, 23(8):1135–1140, 2020.

[16] David Ulrich Seidel, Andreas M Sesterhenn, and Karel Kostev. Seasonal variation of epistaxis in Germany. *Journal of Craniofacial Surgery*, 29(4):e365–e367, 2018.

[17] Jelavic B *et al.* Idiopathic epistaxis and meteorological factors: case-control study. *B-ENT*, 11(4):267–273, 2015.

[18] D Bray, C E B Giddings, P Monnery, N Eze, S Lo, and A G Toma. Epistaxis: are temperature and seasonal variations true factors in incidence? *The Journal of Laryngology & Otology*, 119(9):724–726, 2005.

[19] Daniel J Pallin, Yi-Mei Chng, Mary Patricia McKay, Jennifer A Emond, Andrea J Pelletier, and Carlos A Camargo Jr. Epidemiology of epistaxis in US emergency departments, 1992 to 2001. *Annals of emergency medicine*, 46(1):77–81, 2005.

[20] João Mangussi-Gomes, Mariana Junqueira Reis Enout, Thaiana Carneiro de Castro, José Santos Cruz de Andrade, Norma de Oliveira Penido, and Eduardo Macoto Kosugi. Is the occurrence of spontaneous epistaxis related to climatic variables? A retrospective clinical, epidemiological and meteorological study. *Acta otolaryngologica*, 136(11):1184–1189, 2016.

[21] Thorsten Send *et al.* Etiology, management, and outcome of pediatric epistaxis. *Pediatric emergency care*, 37(9):466–470, 2021.

[22] Brian Carey and Patrick Sheahan. Aetiological profile and treatment outcomes of epistaxis at a major teaching hospital: a review of 721 cases. *Irish Journal of Medical Science (1971-)*, 187(3):761–766, 2018.

[23] Dan Yaniv, Ofir Zavdy, Einav Sapir, Lirit Levi, and Ethan Soudry. The Impact of Traditional Anticoagulants, Novel Anticoagulants, and Antiplatelets on Epistaxis. *The Laryngoscope*, 131(9):1946–1951, 2021.

[24] S J C Fishpool and A Tomkinson. Patterns of hospital admission with epistaxis for 26,725 patients over an 18-year period in Wales, UK. *The Annals of The Royal College of Surgeons of England*, 94(8):559–562, 2012.

[25] Michael Reiß and Gilfe Reiß. Epistaxis: some aspects of laterality in 326 patients. *European Archives of Oto-Rhino-Laryngology*, 269(3):905–909, 2012.

[26] D Kikidis, K Tsioufis, V Papanikolaou, K Zerva, and A Hantzakos. Is epistaxis associated with arterial hypertension? A systematic review of the literature. *European Archives of Oto-Rhino-Laryngology*, 271(2):237–243, 2014.

[27] Sandeep Sharma, Sadat Qureshi, Shalini Jadia, and Lavi Ukawat. Epistaxis: Revisited. *Indian Journal of Otolaryngology and Head & Neck Surgery*, 72(4):480–483, 2020.

[28] R Fox, R Nash, Z W Liu, and A Singh. Epistaxis management: current understanding amongst junior doctors. *The Journal of Laryngology & Otology*, 130(3):252–255, 2016.

[29] P Joice, P Ross, G Robertson, and P White. The effect of hand dominance on recurrent idiopathic paediatric epistaxis 1. *Clinical Otolaryngology*, 33(6):570–574, 2008.

[30] Seckin Ulusoy, Gulcin Babaoglu, Tolgahan Catli, Turhan San, and Cemal Cingi. Epistaxis and Staphylococcus aureus colonization in the nasal vestibule: is it a cause or consequence? *Journal of Craniofacial Surgery*, 25(6):e513–e515, 2014.

http://doi.org/10.33091/amj.2023.142880.1345