



Epistaxis: A prospective clinical study

Ausama Fahmy Al-Banna *

Department of Surgery, ENT unit, AL- Sheikhan general hospital, Mosul, Iraq.

GSC Biological and Pharmaceutical Sciences, 2025, 30(03), 347-357

Publication history: Received on 12 February 2025; revised on 21 March 2025; accepted on 24 March 2025

Article DOI: <https://doi.org/10.30574/gscbps.2025.30.3.0123>

Abstract

Epistaxis is one of the most common ear, nose and throat (ENT) emergencies to present to general practitioners. Epistaxis may be simple and readily treatable condition but it sometimes led to potential consequences of severe and life-threatening bleeding. 160 patients 88 were males and 72 were females complained from epistaxis who had consulted the Ear, Nose and Throat (E.N.T.) department at Al-Sheikhan Hospital for the period from September (2023) to December (2024) were recorded in the study. They were asked in specially-constructed questionnaire about age, sex, history and full general and otolaryngological examination and laboratory and radiological investigation if indicated.

Conclusion The current study concluded that there is a slight male dominance in sex distribution. The secondary causes of epistaxis were slightly commoner than the primary one. The anterior bleeding is the commonest site of epistaxis. Recurrent epistaxis was usually minor, non-life-threatening and often easily managed while acute epistaxis was usually severe. There is a significant relationship between secondary epistaxis and the age of patients. Traumatic factor is the most common local cause, anticoagulant medications are the most common systemic cause. There is a significant relationship of hypertension with the site and the aetiology of epistaxis. Nasal endoscopy is very helpful procedure for better assessment and evaluation of posterior epistaxis.

Keywords: Epistaxis; Social Habit; Etiology; 2ry Causes

1. Introduction

Epistaxis is the medical term for a nosebleed which means loss of blood from the tissue that lines the nose either from one or both nostrils but, usually, it only affects one nostril. It is considered as one of the most frequent and most difficult to treat ear, nose, and throat emergencies encountered in both primary care and emergency settings (1).

Epistaxis can occur due to tearing in the minor blood vessels which supply the septum that may occur due to hard nasal picking, severe impact on the nasal septum, dry nasal mucosa, even in cases of fever (2). In addition, abnormalities such as clotting disorders or hemophilia, nasal polyps, or nasopharyngeal cancer can all cause epistaxis, even some medications, such as anticoagulants in patients with cardiac problems can cause epistaxis as well (3). The veins arise from a mesh-like plexus beneath the mucous membrane, the veins follow the arteries within the mucosa (4). Two vascular key clinical areas; The Kiesselbach plexus in the Little's area and the Woodruff's plexus (5). Epistaxis is classified traditionally on the basis of aetiology to local and systemic causes (6), or according to the age into childhood or adulthood. Others classified it according to the anatomical site of bleeding into anterior and posterior, or based on the severity and frequency of the bleeding into acute, recurrent, mild, moderate or severe (7). Management of nosebleeds includes resuscitation and stop the bleeding, history, examination and identification of the bleeding point. Investigation and establishment of treatment plan which either surgical or non-surgical (8). Conclusion: it is concluded that males are more likely suffering from epistaxis. the secondary causes were most common than the primary one and

* Corresponding author: Ausama Fahmy Al-Banna

traumatic factors was the most common local cause, the anterior bleeding is commonest. There is a significant relationship between secondary epistaxis and the age of patients.

2. Materials and methods

2.1. Study design

The study design is prospective study included 160 patients complained from epistaxis who had consulted the Ear, Nose and Throat (E.N.T.) department at Al-Sheikhan Hospital for the period from September (2023) to December (2024).

2.2. Study Approval

The study was approved by the medical research ethical committee in Nineveh Health Department/ Mosul, Iraq. All parents and patients were asked to sign the consent form after explaining the method of study to them.

2.3. Patients and methods

One hundred sixty patients, 88 were males (55%) and 72 were females (45%) were included in the current study. All patients were seen either at the out-patient department or the reception room of the E.N.T. ward where every patient (or his/her parents or relatives) was asked in specially-constructed questionnaire about age, sex, occupation, duration of each episode of epistaxis and of the whole condition, severity of bleeding, similar previous attacks, possible etiological factors, social habits (smocking and alcohol consumption), medical history, family history and drug history.

A thorough examination of the nasal cavity by anterior rhinoscopy was done following the application of a local anaesthetic and vasoconstrictor drug (xylocain 2% with adrenaline 1:100000) to find out any possible anatomical or pathological abnormalities in the nasal cavity. Endoscopic examination of the nasal cavity was done for those patients with unidentifiable bleeding site by anterior rhinoscopy.

If the bleeding was active at time of presentation, resuscitation effort was done including arrest of bleeding by local pressure, cold pack application and cautery (if the site of bleeding was identifiable), monitoring of vital signs, intravenous access and baseline blood estimations. If these efforts were failed anterior and packing was done.

A group of patients was admitted to the ward for investigations and treatment.

Estimation of packed cell volume with hemoglobin was made routinely for all admitted patients. Coagulation screening, complete blood count and blood film were done for patients with history of bleeding tendency, family history of bleeding disorders, patients with co-morbidity or when the diagnosis was not clear.

More specialized blood investigations, radiological, and histopathological investigations were done in accordance with the clinical situation of each patient.

3. Results

3.1. Age and Sex

Patients in the first three decades of life are 85 in number and had the highest incidence of epistaxis which is 53.1% of all patients, out of these patients are those with 10-19 years age who are 45 in number and constitute 28.1% of all patients

Out of 160 patients, 88 were males (55%) and patients 72 (45%) were females representing a male/female ratio of 1.2:1. (Figure 1)

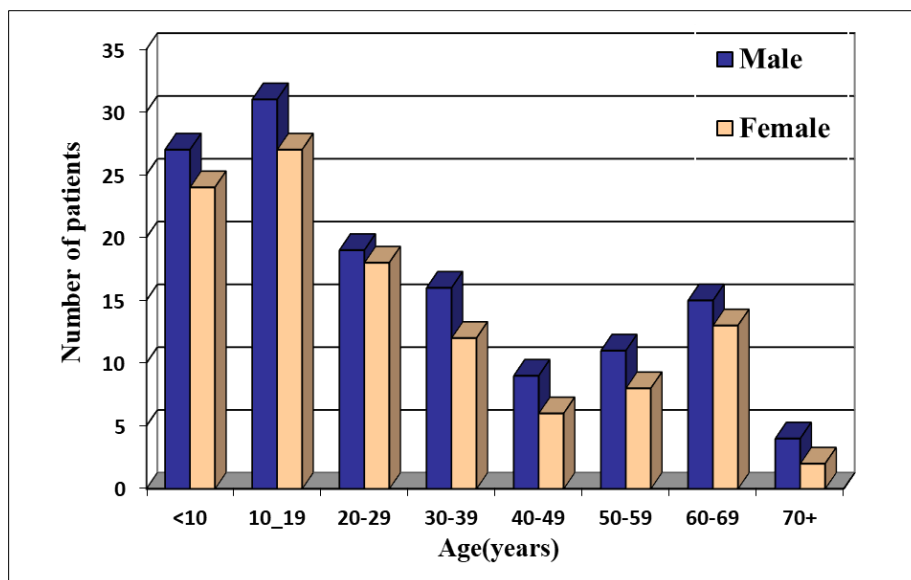


Figure 1 Age and sex distribution of patients with epistaxis

3.2. Social Habits

Smokers' patients were 40 (25%) patients and only 2 (1.25%) were alcoholic.

(Figure 2 and 3).

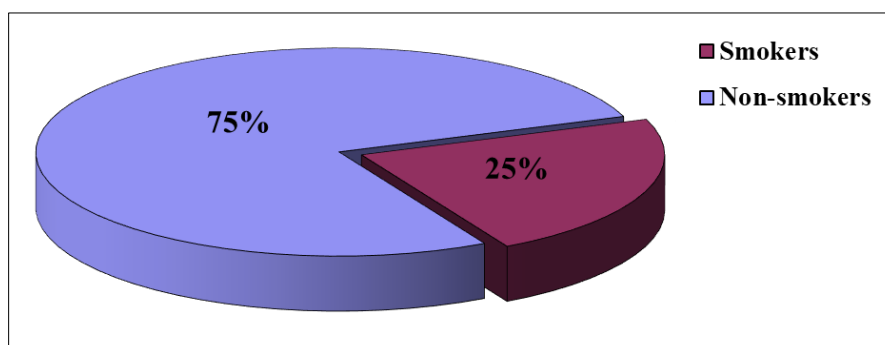


Figure 2 Smoking in patients with epistaxis

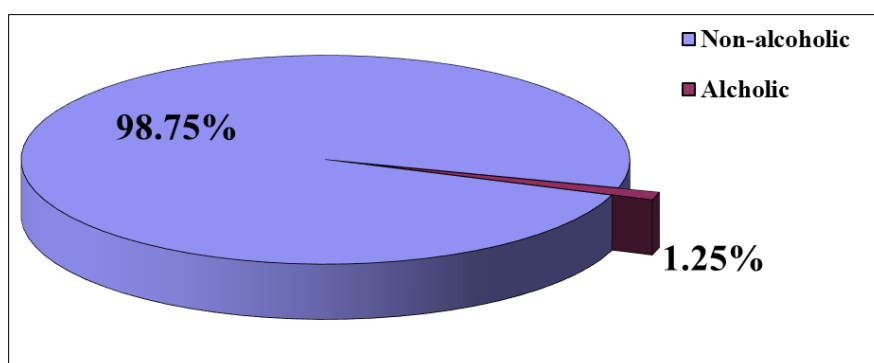


Figure 3 Alcohol consumption in patients with epistaxis

3.3. Aetiological factors

Table (1) shows the possible etiological factors of epistaxis. Primary (idiopathic) epistaxis constituted 46.25 % (n=74) of cases while secondary epistaxis was 53.75 % (n=86).

Idiopathic epistaxis mostly countered in 2nd decade of life (27.2%). According to statistical analysis, idiopathic epistaxis had no significant relationship with age of patients (p-value > 0.05).

Secondary epistaxis was divided into local and systemic causes. Local causes constituted 31.4 % of all cases while systemic causes constituted 22.6% with significant statistical relationship with the age (p-value :<0.0001).

Patients below 40 years old constituted 83% of local causes and the maximum age group was 10-19 years old (32%).

Systemic causes mostly found at 60-69 years age group with 22.1 %, followed by 10-19- and 50-59-years age groups with 19.4 %. (Table 1)

Table 1 Aetiology of epistaxis according to age of patients

Aetiology Age	Primary (idiopathic)		Secondary			
			Local causes		Systemic causes	
	No.	%	No.	%	No.	%
< 10	13	17.6	10	20	4	11.1
10-19	20	27.2	16	32	7	19.4
20-29	9	12.6	10	20	1	2.9
30-39	7	9.1	8	16	1	2.9
40-49	5	6.9	3	6	2	5.5
50-59	9	12.6	1	2	7	19.4
60-69	8	11	1	2	8	22.1
70+	2	3	1	2	6	16.7
Total	74 (46.25%)	100	50 (31.4%)	100	36 (22.6%)	100
Significance	p > 0.05 (NS)		p < 0.0001		p < 0.0001	

Regarding local causes, trauma is the commonest aetiology that comprised 54% (n=27), followed by inflammatory diseases which constituted 32% (n=16) (Figure 4).

Traumatic causes of epistaxis distributed between nose picking, accident, nasal surgery and nasal foreign bodies. Nose picking was the most frequent (Figure 5).

Traumatic causes were the commonest aetiology that comprise 54% (n = 27) of local causes followed by inflammatory diseases which constituted about 32% (n= 16) of patients. Structural abnormalities including septal spurs and perforations (8 % , n=4) and neoplasms (6% , n= 3) were also encountered in this study.

The inflammatory diseases causing epistaxis include upper respiratory tract infections (56%), allergic rhinitis (32%) and pyogenic granuloma (12%) are shown in (Figure 6)

Systemic causes were mainly attributed to the coagulation deficits (58%, n=20), while the vascular diseases and the cardiovascular conditions form the remaining percentages (Figure 7).

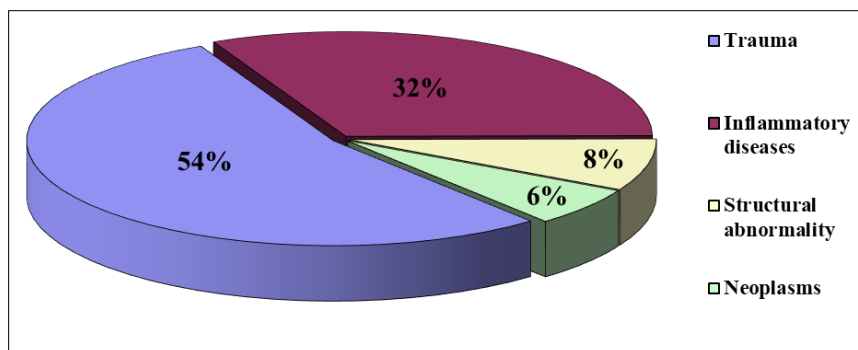


Figure 4 Distribution of local causes of epistaxis

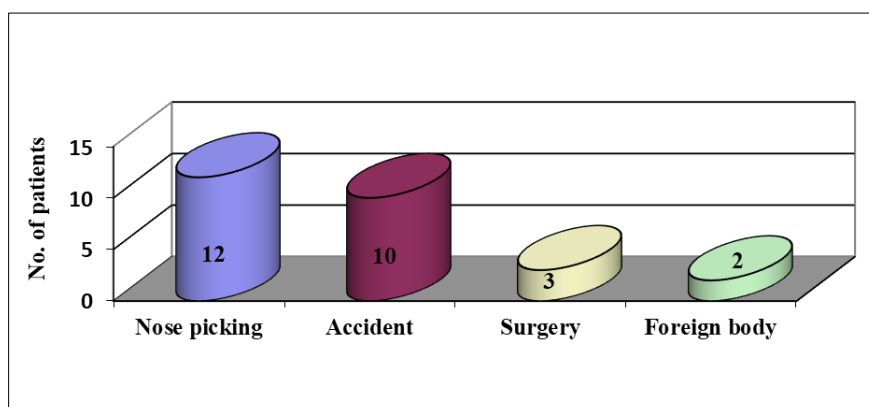


Figure 5 Frequency of traumatic causes of epistaxis

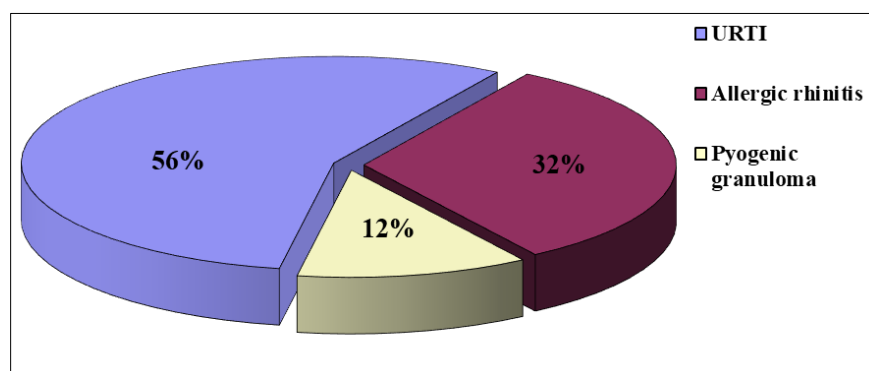


Figure 6 Frequency of inflammatory causes of local etiological epistaxis

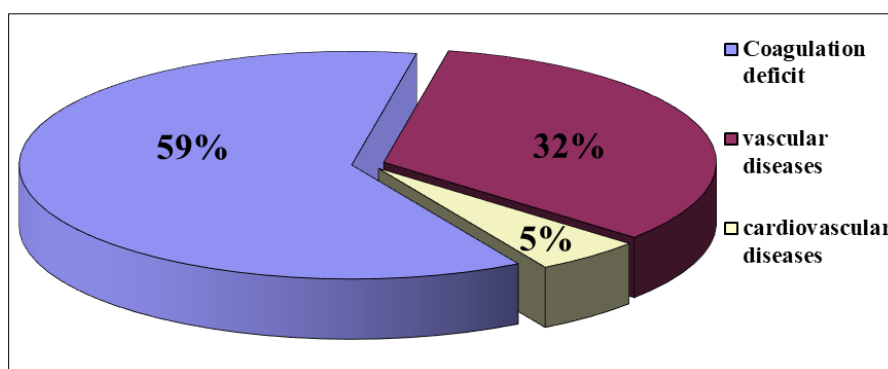


Figure 7 Distribution of systemic causes of epistaxis.

3.4. Site of bleeding

The relative frequency of bleeding in each site in relation with age is shown in table (2). Most frequent site was anterior epistaxis, forming 71% (no: 113) of all patients. Posterior epistaxis constituted 19.5 % (no: 31) of cases while 9.5 % (no :16) of cases were non-identified site of bleeding.

Statistical analysis using X2 test revealed that there was significant relation between anterior and posterior epistaxis with the age groups of patients (p-value: 0.001, 0.012 respectively). Most of anterior epistaxis (75%) were countered in patients less than 40 years old, while posterior epistaxis occurred most frequently in the 6th decade of life (19 %). On the other hand, the non-identified epistaxis was 16 patients only (9.5%)

Table 2 Site of bleeding in relation to the age of patients with epistaxis.

Age	Anterior		Posterior	
	No.	%	No.	%
<10	21	19	3	10
10-19	36	32	5	17
20-29	16	14	3	10
30-39	11	10	2	7
40-49	6	5	2	7
50-59	8	7	6	19
60-69	10	9	5	15
70+	5	4	5	15
Total	113 (71%)	100	31 (19.5%)	100
Significance	p-value:0.001		p-value:0.012	

(p-value >0.05 = Not significant , < 0.05 = Significant)

The anterior epistaxis is divided into three anatomical subdivisions; the Little's area, muco-cutaneous junction and vestibule. The percentage from these sites were 94%, 4% and 2% respectively. (Figure 8)

Posterior bleeding recognized in three anatomical sites; the septum, the lateral wall and the floor. The percentage from these sites was 60%, 29.5% and 10.5% respectively (Figure 9). No bleeding could be identified from the roof of nasal cavity.

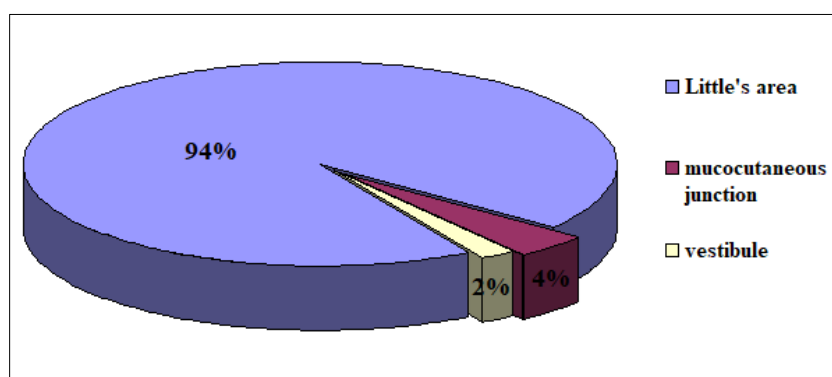


Figure 8 Site of bleeding in anterior epistaxis

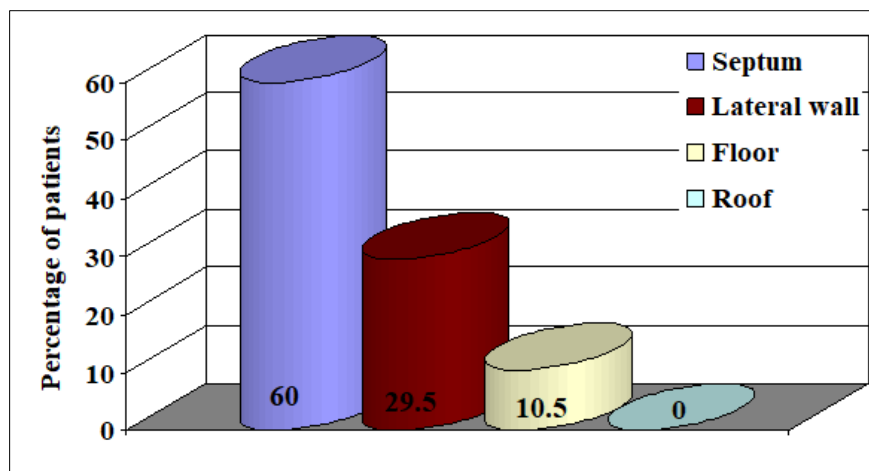


Figure 9 Site of bleeding in posterior epistaxis

The relationship between the bleeding sites with aetiology is shown in (Table 3) and statistically, it reveals significant relation between the bleeding and the aetiology of epistaxis (p -value < 0.05). 43.4% of anterior epistaxis was idiopathic whereas 38 % was due to local causes and 18.6% due to systemic causes. Regarding posterior epistaxis, 54.8% was idiopathic, 16.2 % caused by local factors and 29 % was due to systemic causes. Epistaxis of non-identified site of bleeding was mostly idiopathic (50%) whereas 43.75 % were due to systemic causes and only 6.25 % caused by local factors.

Table 3 The bleeding sites according to the aetiology of epistaxis.

Site Aetiology	Anterior		Posterior		Non-identified		Total	
	No.	%	No.	%	No.	%	No.	%
Primary (idiopathic)	49	43.4	17	54.8	8	50	72	45
Secondary/ Local causes	43	38	5	16.2	1	6.25	49	30.6
Secondary/ Systemic causes	21	18.6	9	29	7	43.75	39	24.4
Total	113	100	31	100	16	100	160	100
P-value	< 0.0001		0.037		0.011		0.001	

4. Discussion

Epistaxis is the most frequent attended emergency to ENT departments and approximately 60% of the population has at least one bleeding episode over the course of a lifetime (9).

4.1. Age and sex

In the current study, the predominant age groups suffered from epistaxis were < 10 years, 10-19 and 20-29 age groups, forming 57 % of patients. The 2nd decade of life was the most frequent age group which constituted 27% of patients.

Similarly, Hay (1989) (10), Alanaserie (1997) (11), Al-bayat (2005) (12) and Dal Secchi et al (2009) (13) had the same results.

On the other hand, Hussain et al (2006) (14) showed a bimodal age presentation of epistaxis in young and elderly age groups. Furthermore, Byun et al (2020) (15) showed that the highest incidence occurred during the fifth, sixth and

seventh decades; this observation may be attributed to the possibilities of long-life span in the developed countries with high incidence of atherosclerosis among middle and elderly patients.

The highest number of patients recorded in this study were children, adolescents and early adulthood and this could be due to their greater susceptibility to upper respiratory tract infections and nasal trauma.

Paranjothy et al (2009) (16) proofed that epistaxis is rarely encountered in infants which coincides with our study; only one patient below one year of age was recorded.

As seen from the study; there is a little difference between either sex as male to female ratio was 1.2:1. This result is the results of observations of previous studies that made by Al-Ansarie (1997) (11) and Padgham (1990) (17). This slight male preponderance may be because males are more exposed to trauma and other environmental hazards than females due to the difference in their life style.

4.2. Social Habits

Smokers' patients were 56 patients (23%) and only 3 patients (1.2%) declared that they were alcoholic. Cigarette smoking may irritate nasal mucosa and cause thinning of the lining of the nose (18). In our locality, for religious and social causes, alcohol consumption is uncommon, but there is a proven association between alcohol and epistaxis as it is associated with prolongation of the bleeding time due to platelets dysfunction (19).

4.3. Aetiological factors

Primary (idiopathic) epistaxis was 46 % of patients; in which no cause was found from the history, careful clinical examination and investigations. Secondary epistaxis due to local causes was 31.4% of cases and secondary epistaxis due to systemic causes was 22.6%. These data coincide with result of Dal Secchi et al (2009) (13) and Hussain et al (2006) (14).

On the other hand, Alnaseri (1997) (11) and Varshney (2005) (20) recorded higher percentage of local and systemic causes.

Local and systemic causes of secondary epistaxis had a significant relationship with the age (p-value :<0.0001). Regarding local causes, patients below 40 years old constitute about 87 %. This is most probably because the nose is a prominent feature on the face is highly susceptible to craniofacial injury, in addition, the little area which is highly vascular and susceptible to various irritant and drying effect of air and the finger (nose picking) and foreign body insertion of curious child. Additionally, the trauma is the most common local causes and this age group were more vulnerable to accident, sport or outdoor activities (21) (22).

Traumatic causes were the commonest aetiology that comprise 54% (n = 42) of local causes followed by inflammatory diseases which constituted about 32% (n= 25) of patients. Structural abnormalities including septal spurs and perforations (8 % , n=6) and neoplasms (6% , n= 5) were also encountered in this study. Similarly, Nasal trauma was considered as the commonest cause of epistaxis in the studies of Olatoke et al (2006) (23), Chaiysata et al (2005) (24) and Huang (2002) (25).

Traumatic causes of epistaxis distributed between nose picking, accident, nasal surgery and nasal foreign bodies but nose picking was the most frequent cause. These results are similar to the result of Arshad et al (2007) (26).

Five patients had epistaxis on day 0-7 postoperatively, three patients post-septal surgery and two patients post-endoscopic sinus surgery. Bleeding can occur after almost any nasal surgery and is seldom difficult to manage except the severe hemorrhage which occurs following inferior turbinectomies (27).

Inflammatory diseases including acute and chronic conditions can cause epistaxis due to increased mucosal hyperemia with increased capillary permeability (28). Most of inflammatory related epistaxis was recorded in patients < 30 years of age (22 out of 25 patients). This could be related to the high incidence of upper respiratory infections and allergic rhinitis in this age group. In this study 56% (n=14) of the inflammatory related epistaxis was due to upper respiratory infections, followed by allergic rhinitis 32% (n=8). These results are in agreement to the results of Chaiysata et al (2005) (24) and Huang et al (2002) (25).

In this study, epistaxis due to systemic causes mostly found at 60-69 years age group (21%). Systemic causes were mainly attributed to the coagulation deficits (59%, n= 33), while the vascular diseases including atherosclerosis was 32% (n =18) and the cardiovascular conditions including heart failure was 9 % (n =5).

Anti-coagulant medications including warfarin, heparin, aspirin and to a lesser extent other non-steroidal anti-inflammatory drugs, were the most frequent cause regarding coagulation deficits (18.5 %, n =6). Similarly, Shaheen (1987) (29), and Watson et al (1990) (30) regarded the anti-coagulant medications as the most important factor which causes coagulation deficit related epistaxis.

4.4. Site of bleeding

In this study, most frequent site was anterior (71%, n=113). Posterior epistaxis constituted 19.5% (n=31) of cases while 9.5% (n=16) of cases had non-identifiable site of bleeding. These results are similar to the results of Chaiysata et al (2005) (24), Al-bayaty (2005) (12) and Arshad et al (2007) (26). On the other hand, Supriya et al (2010) (31) found that there were no non-identifiable bleeding sites in their patients.

Statistically, there is a significant relationship between anterior and posterior bleeding and age of the patient (p-value: 0.001, 0.012 respectively). Most of anterior epistaxis (75%) were countered in patients less than 40 years old while posterior epistaxis occurred most frequently in the 6th decade of life (19 %). This data proofs the concept that most adult epistaxis was posterior in origin and anterior epistaxis usually encountered at young age groups (32).

The Little's area was the major site of anterior epistaxis (94%) while muco-cutaneous junction and vestibule were rarely encountered; 4% and 2% respectively. This is generally accepted for almost all authors (33) (34).

Similarly, El-Silimy (1993) (35) found that 60% of bleeding points were septal. Furthermore, McGarry (1995) (36) identified the bleeding points in the septum in 70 % of the posterior epistaxis and 24 % from the lateral wall. On the contrary, Wurman et al (1988) (37) did not report any septal bleeding and the lateral wall of nasal cavity was the main source of posterior bleeding.

Statistically, the current study showed that there was a significant difference in the sites of bleeding in relation with hypertension in anterior and posterior epistaxis. Twenty nine percent of patients with posterior epistaxis were hypertensive, but only 4% with anterior bleeding were hypertensive. This is with the notion that most of the posterior epistaxis in adult are related to hypertension as either causal or contributing factor (38).

The study also revealed that there was a significant statistical relation between bleeding and aetiology of epistaxis. Most of anterior epistaxis were either idiopathic (43.4%) or due to local causes (38 %) and only (18.6%) due to systemic causes. On the other hand, most of the posterior epistaxis were either idiopathic (54.8%) or due to systemic causes (29%) and only 16.2% of patients were caused by local factors.

Epistaxis of non-identified site of bleeding was mostly idiopathic (50%) or due to systemic causes (43.75%) and only 6.25 % caused by local factors. Above data are with the general concept that anterior epistaxis is mostly related to local factors of aetiology and posterior epistaxis mostly related to adult idiopathic or systemic factors of aetiology (39).

5. Conclusion

The current study concluded that there is a slight male dominance in sex distribution. The secondary causes of epistaxis were slightly commoner than the primary one. The anterior bleeding is the commonest site of epistaxis. Recurrent epistaxis was usually minor, non-life-threatening and often easily managed while acute epistaxis was usually severe, resulting in hospitalization and carrying a high morbidity. There is a significant relationship between secondary epistaxis and the age of patients.

Traumatic factor is the most common local cause. Anticoagulant medications are the most common systemic cause. Nasal endoscopy is very helpful procedure for better assessment and evaluation of posterior epistaxis

Compliance with ethical standards

Statement of ethical approval

The study was approved by the medical research ethical committee in Nineveh Health Department/ Mosul, Iraq. All parents and patients were asked to sign the consent form after explaining the method of study to them.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

- [1] Tunkel DE, Anne S, Payne SC, Ishman SL, Rosenfeld RM, Abramson PJ, Alikhaani JD, Benoit MM, Bercovitz RS, Brown MD, Chernobilsky B, Feldstein DA, Hackell JM, Holbrook EH, Holdsworth SM, Lin KW. Clinical Practice Guideline: Nosebleed (Epistaxis). *Otolaryngol Head Neck Surg.* 2020;162(1): S1-S38. doi: 10.1177/0194599819890327.
- [2] Jason P. Womack, Md; Jill Kropa, Md; And Marissa Jimenez Stabile, Do, Rutgers University Robert Wood Johnson Medical School, New Brunswick, New Jersey, Epistaxis: Outpatient Management, *Am Fam Physician.* 2018; 98 (4):240-245.
- [3] Tabassom A, Dahlstrom JJ. Epistaxis. [Updated 2022 Sep 12]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK435997>.
- [4] McGarry GW. Epistaxis. In: Lund. VJ, editor. *Scott-Brown's Otolaryngology, head and neck surgery.* 7th ed., vol.2, part 13, London: Hodder Arnold; 2008. p.1595-608.
- [5] Snell RS. *Clinical Anatomy.* 7TH ed., USA: Lippincott Williams and Wilkins: 2004. p. 861.
- [6] Jafek BW, Murrow BW. *ENT Secrets.* 3rd ed., USA: Elsevier Mosby; 2005. p. 322-326.
- [7] Charles WC, Paul WF. *Cumming's: Otolaryngology: Head & Neck Surgery,* 4th ed., 2005, Pennsylvania, USA: Elsevier Mosby;.
- [8] Trotter MI, De R, Drake-Lee A. Evidence-based management of epistaxis in adults. *Br J Hosp Med.* 2006;67(12):651-3.
- [9] Rivero VP, Ruiz GT. Considerations about ENT emergencies: Analysis of 30000 patients assisted in 10 years. *Acta Otorrinolaringol Esp* 2005; 56: 198-201.
- [10] hay S, Shapiro NL, Bhattacharyya N. Epidemiological characteristics of pediatric epistaxis presenting to the emergency department. *Int J Pediatr Otorhinolaryngol.* 2017;103:121-124. doi: 10.1016/j.ijporl.2017.10.026.
- [11] Al-Ansarie AK (1997). *EPISTAXIS: A Prospective Clinical Study.* Thesis For fellowship of Iraqi commission for medical specialization of otolaryngology, Basra, Iraq.
- [12] AL-Bayat KA. (2005). *Epistaxis: Aetiology and management.* Thesis for fellowship of Iraqi commission for medical specialization of otolaryngology, Mosul, Iraq.
- [13] Dal Secchi MM, Indolfo MLP, Rabesquine MM, De Castro FB. Epistaxis: Prevailing Factors and Treatment. *Intl. Arch. Otorhinolaryngol.* 2009;13(4): 381-385.
- [14] Hussain G, Iqbal M, Shah SA, Said M, Khan SA, Zaman J. Evaluation of aetiology and efficacy of management protocol of epistaxis. *Journal of Ayub Medical College* 2006;18(4):62-5
- [15] Byun H, Chung JH, Lee SH, Ryu J, Kim C, Shin JH. Association of Hypertension with the Risk and Severity of Epistaxis. *JAMA Otolaryngol Head Neck Surg.* 2020; 10;147(1):1-7. doi: 10.1001/jamaoto.2020.2906.
- [16] Paranjothy S, Fone D, Mann M, Dunstan F, Evans E, Tomkinson A, Sibert J, Kemp A. The incidence and aetiology of epistaxis in infants: a population-based study. *Arch Dis Child.* 2009 Jun;94(6):421-4. doi: 10.1136/adc.2008.144881..
- [17] Padgham N, Epistaxis: anatomical and clinical correlates. *Journal of Laryngology and Otology* 1990; 104: 308-11. doi: 10.1017/s0022215100112563

- [18] Leopold PL, O'Mahony MJ, Lian XJ, Tilley AE, Harvey BG, et al. (2009) Smoking Is Associated with Shortened Airway Cilia. *PLOS ONE* 4(12): e8157. doi: 10.1371/journal.pone.0008157.
- [19] Soyka, M.B., Schrepfer, T. & Holzmann, D. Blood markers of alcohol use in epistaxis patients. *Eur Arch Otorhinolaryngol.* 2012; 269: 1917–1922. doi:10.1007/s00405-011-1881-7
- [20] Varshney S, Saxena RK. Epistaxis: A retrospective clinical study. *Indian journal of otolaryngology and head and neck surgery* 2005; 57(2).
- [21] Ray C. Epistaxis in children. In: Ray C, editor. *Scott-Brown's Otolaryngology, head and neck surgery*. 7th ed., vol.1, part 12, London: Hodder Arnold; 2008. p. 1064-68.
- [22] Faistauer M, Faistauer Â, Grossi RS, Roithmann R. Clinical outcome of patients with epistaxis treated with nasal packing after hospital discharge. *Braz J Otorhinolaryngol* 2009;75(6):857-65.
- [23] Olatoke F, Ologe FE. Epistaxis. A five-year review. *Saudi Med J* 2006; 27(7).
- [24] Chaitsate S, Roongrotwattansiri K et al. Epistaxis in Chiang Mia university hospital. *Journal of the medical association of Thailand* 2005; 88(9): 1282-6
- [25] Huang CL, Shul CH. Epistaxis: A Review of Hospitalized Patients. *Chinese Medical Journal (Taipei)* 2002; 65:74-78.
- [26] Arshad M, Ahmed Z, Ali L. EPISTAXIS: An experience with over 100 cases. *The Journal of the Pakistan Medical Association* 2007;32(2).
- [27] Garth RJN, Cox HJ, Thomas MR. Haemorrhage as a complication of inferior turbinectomy: A comparison of anterior and radical trimming. *Clinical Otolaryngology* 1995;20:236-8.
- [28] Chopra R., Epistaxis: A review. *The Journal of the Royal Society for the promotion of Health* 2000; 120(1):31–3.
- [29] Shaheen RS. Epistaxis. In: Mackay IS, Bull TR, editors. *Scott-Brown's Otolaryngology*. 5th ed., vol. 4., London : Butterworth; 1987. p. 272-282.
- [30] Watson MG, Shenoi PM. Drug-induced epistaxis. *Journal of the Royal Society of Medicine* 1990; 83.
- [31] Supriya M, Shakeel M, Veitch D, Ah-See KW. Epistaxis: prospective evaluation of bleeding site and its impact on patient outcome. *The Journal of Laryngology and Otology* 2010;124(7):744-9.
- [32] Parajuli R. Evaluation of Etiology and Treatment Methods for Epistaxis: A Review at a Tertiary Care Hospital in Central Nepal. *Int J Otolaryngol.* 2015;2015:283854. doi: 10.1155/2015/283854.
- [33] Tabassom A, Dahlstrom JJ. Epistaxis. 2022 Sep 12. In: StatPearls [Internet]. Treasure Island (FL): StatPearls ; 2025 . PMID: 28613768.
- [34] Becker, A.M. (2013). Epistaxis. In: Kountakis, S.E. (eds) *Encyclopedia of Otolaryngology, Head and Neck Surgery*. Springer, Berlin, Heidelberg. Doi:10.1007/978-3-642-23499-6_494.
- [35] El-Silimy O. Endonasal endoscopy and posterior epistaxis. *Rhinology* 1993; 3:119-20.
- [36] McGarry GW, Gatehouse S, Vernham G. Idiopathic epistaxis: haemostasis and alcohol. *Clinical Otolaryngology* 1995; 20:174-7.
- [37] Wurman LH, Sack JG, Flannery JV, Paulson JO. Selective endoscopic electrocautery for posterior epistaxis. *Laryngoscope* 1988; 98: 1348-9.
- [38] Isezuo SA, Segun-Busari S, Ezunu E, Yakubu A, Iseh K, Legbo J, Alabi BS, Dunmade AE, Ologe FE. Relationship between epistaxis and hypertension: a study of patients seen in the emergency units of two tertiary health institutions in Nigeria. *Nigerian journal of clinical practice*. 2008; 11(4):379-82
- [39] Kożuchowski Marcin, Prylińska Monika. Epistaxis etiology and treatment. *Journal of Education, Health and Sport*. 2021;11(9):755- 760. doi.org/10.12775/JEHS.2021.11.09.091