

# Etiological characteristics and management of patients with epistaxis in Aksaray

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## Abstract

**Aim:** Epistaxis is a common condition in humans, particularly in patients with hypertension, and is one of the most common presenting symptoms in ear, nose, and throat emergency consultation. The present study aimed to examine the treatment and hospitalization characteristics of the patients who presented with epistaxis in Aksaray city and to propose an optimized and updated protocol.

**Material and Methods:** The present study retrospectively evaluated 758 patients who presented with epistaxis to the Training and Research Hospital in Aksaray between January 2016 and February 2020. The patients were analyzed in terms of age, sex, seasonal characteristics, hospitalization rates, pathogenesis of epistaxis, sites of bleeding, and treatments.

**Results:** The study included 349 females (46.1%) and 409 males (53.9%); mean patient age was  $60.9 \pm 9.3$  years (range: 3–89 years). The most common comorbidity was hypertension (47.3%), and the most common site of bleeding was the anterior region including the Kiesselbach's plexus (88.2%). Nasal packing (58.5%) and electrocauterization (29.9%) were performed in most cases. The treatment success was defined as no instance of re-visit by the patients to the hospital due to nasal bleeding within 24 h after the procedure; the treatment was successful in 698 patients (92.1%).

**Conclusion:** Most cases of epistaxis are successfully treated using endoscopic electrocauterization on an outpatient basis. Hospitalization is indicated if surgical intervention, posterior packing, or embolization is required and if deterioration of general condition is observed. The present study proposes an updated protocol optimized for the management of epistaxis.

**Keywords:** Electrocauterization; ENT emergency; epistaxis; hospitalization

## INTRODUCTION

Epistaxis, an expensive and common condition, is defined as active nasal bleeding. This condition affects approximately 60% of individuals, with it being an ear, nose, and throat (ENT) emergency for some of the individuals, and 1 in 10 people with bleeding presents to hospitals for medical assistance (1). In addition, these patients constitute 0.5% of the individuals visiting the emergency department (2). Although most patients with epistaxis receive outpatient treatment, those with persistent disease or comorbidity are hospitalized for invasive procedures. However, there is no consensus regarding the identification of patients who ought to be hospitalized (1).

A previous study examined a large group of patients with epistaxis and reported that other factors associated with this condition include sinonasal disease, old age, hypertension, and coagulopathy (3). Further, diabetes mellitus, heart failure, excessive alcohol consumption, and warfarin use are reportedly additional risk factors (4). The strategy employed for the treatment of patients

with epistaxis depends on the general condition of patient and the location and severity of bleeding (5). During emergency intervention, keeping the airway open and providing respiratory and circulatory controls are prioritized, thereby subsequently identifying the sites of bleeding and controlling other underlying diseases such as hypertension (6). Various methods employed for patients requiring hospitalization include nasal packing, cauterization, and arterial embolization or ligation (7). Although several studies have been conducted on the management of epistaxis and the expenses associated with its management, the characteristics of patients who require hospitalization have not yet been defined, and no demographic factors related to the financial burden experienced by these patients have yet been reported (1).

The present study aimed to examine the data of patients who presented to the emergency departments and otorhinolaryngology clinics with nasal bleeding, to define the hospitalization criteria, and to propose an updated protocol for the management of epistaxis.

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## MATERIAL and METHODS

In the present study, data from 758 patients who were admitted due to epistaxis to the Aksaray University Training and Research Hospital, Emergency Department and Otorhinolaryngology Clinic, treated, and discharged between January 2016 and February 2020 were retrospectively reviewed. The patient records were analyzed in terms of age, sex, seasonal characteristics, hospitalization rates, traumas, sinonasal pathologies, cardiovascular diseases, blood diseases, other comorbidities, interventions for bleeding, and discharge. Sites of bleeding were divided into as anterior and posterior bleeding: anterior nasal bleeding was defined as bleeding from the region located in the anterior 1/2 of the septum (including the Kiesselbach's plexus), whereas posterior nasal bleeding was defined as bleeding from the posterior part of this region. Interventions performed for patients with epistaxis included nasal packing, cauterization, endoscopic interventions, and arterial ligation. The treatment success was defined as no bleeding following the removal of nasal packing or no instance of re-visit by patients to the hospital due to epistaxis within 24 h after discharge. The study commenced following approval from the Aksaray University Local Ethical Committee (2020/03-58). Patient characteristics are presented in Table 1.

### Statistical analysis

Descriptive statistical data for continuous variables were expressed as mean, standard deviation, and minimum and maximum values, whereas data for categorical variables were expressed as numbers and percentages. Chi-square test was used to determine the relationship between groups and categorical variables, and Student's t-test was used to compare group mean values of continuous variables. All data were analyzed using Statistical Package for Social Sciences (SPSS), and  $P < 0.05$  was considered to denote statistical significance.

**Table 1. Baseline characteristics**

Age (mean, years)	60.9 ± 9.3
Gender (female: male)	349: 409
<b>Age group</b>	
<40	149 (19.7%)
40-64	237 (31.2%)
65-79	242 (31.9%)
≥80	130 (17.2%)
<b>Bleeding zone</b>	
Anterior area	669 (88.2%)
Posterior area	89 (11.8%)
<b>Treatment success (N,%)</b>	698/758 (92.1%)

## RESULTS

Overall, 758 patients presented to our hospital with epistaxis. Mean patient age was 60.9 years (range: 2–91 years), and the study included 409 males (54%) and 349 females (46%). The mean age of males was 61.9 years,

whereas that of females was 59.8 years. In terms of age groups, there were 149 patients (19.7%) aged <40 years, 237 patients (31.2%) aged 40–64 years, 242 patients (31.9%) aged 65–79 years, and 130 patients (17.2%) aged ≥80 years. The distribution of epistaxis cases categorized based on seasons showed that 209 cases presented during summer (27.5%), 192 cases during winter (25.3%), 183 cases during spring (24.2%), and 174 cases during autumn (23%). Although epistaxis was more common during summer compared with other seasons, no significant difference was observed between the seasons ( $p > 0.05$ ). The most common site of bleeding in patients with epistaxis was the anterior nasal region (88.2%), and few cases reported bleeding from the posterior nasal region (11.8%). The most common site of bleeding in the anterior region was the Kiesselbach's plexus (54.3%). Regarding the pathogenesis of epistaxis, cardiovascular diseases, particularly hypertension, were the most common comorbidity, followed by sinonasal diseases, traumas, blood diseases, liver diseases, nasopharyngeal cancer, and hereditary hemorrhagic telangiectasia (Table 2).

**Table 2. Patient history in epistaxis pathogenesis**

Pathogenesis of epistaxis. N, (%)	Value
<b>Cardiovascular diseases</b>	
Hypertension	359 (47.3%)
Other	44 (5.8%)
<b>Sinonasal diseases</b>	
Allergic rhinitis	121 (15.9%)
Chronic sinusitis	35 (4.6%)
<b>Traumas</b>	29 (3.8%)
<b>Blood diseases</b>	13 (1.7%)
<b>Liver diseases</b>	9 (1.2%)
<b>Nasopharyngeal carcinoma</b>	5 (0.6%)
<b>Hereditary hemorrhagic telangiectasia</b>	2 (0.2%)

**Table 3. Epistaxis treatment methods**

Treatment Method. N, (%)	Value
<b>Conservative Treatment</b>	
Nasal packing	443 (58.5%)
Electrocauterization	227 (29.9%)
Treatment of the accompanying disease	9 (1.1%)
<b>Surgical Treatment</b>	
Septoplasty	38 (5.1%)
Endoscopic surgery	40 (5.3%)
Sphenopalatine artery ligation	1 (0.1%)

Despite detailed endoscopic evaluation of the cases, the site of bleeding could not be detected in 64 patients. In patients in whom these sites were detected, bleeding from the Kiesselbach's plexus was found to be most common, followed by bleeding from the sphenopalatine artery and the anterior and posterior ethmoidal arteries.

Overall, 78 (10.2%) patients were hospitalized, and most patients (89.8%) were treated with conservative methods in outpatient emergency departments and otorhinolaryngology clinics. Treatment methods are detailed in Table 3. Following primary treatment, 60 patients re-visited the hospital due to another episode of epistaxis, and the mean age of those patients in whom the primary treatment failed was 61.9 years. The mean hospitalization duration was 4.8 days ( $\pm$  3.7 days).

## DISCUSSION

A study has emphasized that epistaxis affects approximately 5%–10% of the population annually, and otorhinolaryngology is the most common emergency consultation (8). Another study has reported that the prevalence of epistaxis was 10%–12%, of which 10% has received medical treatment and 1%–2% were hospitalized for surgical treatment (9). In our study, the hospitalization rate was 10.3% in patients admitted to the hospital due to epistaxis, which is consistent with the literature. The present study aimed to define the characteristics of the patients who presented to the emergency departments and otorhinolaryngology clinics due to epistaxis in the city of Aksaray and to propose an updated protocol for the treatment of epistaxis.

In the present study, we observed that males (409 cases) experienced epistaxis more frequently compared with females (349 cases). Furthermore, unlike previous studies in the literature (10), we observed that our patients mostly belonged to the age group of 40–79 years. In addition, some risk factors for hospitalization associated with epistaxis, including age, hypertension and other cardiovascular diseases, coagulopathy, sinonasal diseases, and hematological malignancies, have been identified (11). The correlation of epistaxis with seasons has not yet been completely elucidated; reportedly, factors including geographical differences and population characteristics may have an effect on this correlation (3). In the present study, epistaxis was more common in the summer season compared with other seasons; however, this difference was not significant ( $p > 0.05$ ).

Although the correlation between epistaxis and hypertension has extensively been investigated, its pathophysiology has not yet been thoroughly elucidated (12). Nasal vascular structures remain superficial and unprotected under the nasal mucosa. Reportedly, hypertension is a predisposing factor in patients because increased arterial pressure causes endothelial damage in retinal and cerebral vessels, leading to arteriosclerosis in the nasal vascular structures with the same mechanism (13). In our study, the most common comorbidities associated with epistaxis were cardiovascular diseases, among which hypertension was the most common condition (observed in 47.3% of the patients).

Due to the increasing expenses in patients who require hospitalization and surgical intervention, especially embolization, we proposed an updated treatment protocol

for the management of epistaxis. It has previously been reported that electrocauterization, a cost-efficient procedure, is the most effective method for the management of epistaxis (14). In cases of epistaxis, because the sites of bleeding can be easily detected via endoscopy, most cases can be treated using electrocauterization. These patients can be successfully treated on an outpatient basis with no need for hospitalization. First-aid treatments of the patients should be determined by emergency physicians, and resuscitation procedures for circulatory, airway, and respiratory distress conditions should be available. Hospitalization should be considered if surgical intervention, posterior nasal packing, or embolization is required and if the deterioration of general condition is observed. The post-hospitalization treatment should be planned depending on the comorbidities. Embolization is an appropriate alternative for patients with bleeding uncontrolled by posterior patching or surgical treatment.

We determined the demographic characteristics of the patients who presented to our hospital due to epistaxis and proposed an optimized and updated protocol for the management of this condition that can be employed by emergency medicine specialists and otolaryngologists. The main limitation in our study was the inadequate data obtained from patient files owing to the retrospective nature of the study.

## CONCLUSION

We identified the sites of bleeding and described the demographic characteristics of patients who visited our hospital due to epistaxis in Aksaray city. Most patients with active epistaxis were successfully treated using electrocauterization on an outpatient basis. Hospitalization was indicated if surgical intervention, posterior nasal packing, or embolization is required and if deterioration of general condition is observed.

*Competing interests: The authors declare that they have no competing interest.*

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## REFERENCES

1. Goljo E, Dang R, Iloreta AM, et al. Cost of management in epistaxis admission: Impact of patient and hospital characteristics. *Laryngoscope* 2015;125:2642-7.
2. Pallin DJ, Chng YM, McKay MP, et al. Epidemiology of epistaxis in US emergency departments, 1992 to 2001. *Ann Emerg Med* 2005;46:77-81.
3. Purkey MR, Seeskin Z, Chandra R. Seasonal variation and predictors of epistaxis. *Laryngoscope* 2014;124:2028-33.
4. Abrich V, Brozek A, Boyle TR, et al. Risk factors for recurrent spontaneous epistaxis. *Mayo Clin Proc* 2014;89:1636-43.

5. Diamond L. Managing epistaxis. *Jaapa* 2014;27:35-9.
6. Beck R, Sorge M, Schneider A, et al. Current Approaches to Epistaxis Treatment in Primary and Secondary Care. *Dtsch Arztebl Int* 2018;115:12-22.
7. Sacks R, Sacks PL, Chandra R. Chapter 3: Epistaxis. *Am J Rhinol Allergy* 2013;27:9-10.
8. Kaygusuz İ, Karlıdağ T, Keleş E, ve ark. Hastaneye yatırılarak tedavi edilen 68 epistaksisli hastanın retrospektif analizi. *Firat Tıp Derg.* 2004;9:82-5.
9. Scaramuzzi N, Walsh RM, Brennan P, et al. Treatment of intractable epistaxis using arterial embolization. *Clin Otolaryngol Allied Sci* 2001;26:307-9.
10. Douglas CM, Tikka T, Broadbent B, et al. Patterns of hospital admission in 54 501 patients with epistaxis over a 20-year period in Scotland, UK. *Clin Otolaryngol* 2018;43:1465-70.
11. Chaaban MR, Zhang D, Resto V, et al. Demographic, Seasonal, and Geographic Differences in Emergency Department Visits for Epistaxis. *Otolaryngol Head Neck Surg* 2017;156:81-6.
12. Isezuo SA, Segun-Busari S, Ezunu E, et al. Relationship between epistaxis and hypertension: a study of patients seen in the emergency units of two tertiary health institutions in Nigeria. *Niger J Clin Pract* 2008;11:379-82.
13. Celik T, Iyisoy A, Yuksel UC, et al. A new evidence of end-organ damage in the patients with arterial hypertension: epistaxis? *Int J Cardiol* 2010;141:105-7.
14. Lou Z, Wei H, Lou Z. Identification of bleeding sites and microwave thermal ablation of posterior epistaxis. *Acta Otolaryngol* 2019;139:70-4.