Original Research Article

Predictive Risk Factors of Epistaxis: Prospective Study *Les Facteurs De Risques Prédictifs Des Epistaxis: Etude Prospective*

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Abstract

Objective: Describe the characteristics of patients admitted to the otolaryngology emergency department for an episode of epistaxis and analyze epidemiological, clinical, endoscopic data between the two groups in order to establish a model that predicts the risk factors associated to epistaxis. *Methods:* prospective study including 161 adult patients spread over a month in the department of otolaryngology; interesting two groups; patients who had epistaxis (group 1) and those who had another emergency (control group = group 2) in the same study period .A comparison was made of age, sex, time of consultation, surgical or traumatic history, taking medication (anticoagulants, nasal corticoids), hemodynamic parameters at admission (blood pressure, pulse, hemoglobin). Intergroup variations were analyzed using t student and chi-square tests. Univariate and multivariate logistic regression were used to establish a predictive model of occurrence of epistaxis. *Results:* Univariate logistic regression confirmed that the occurrence of epistaxis was associated with male gender, consultation during the night, an history of High Blood pressure (BP) or Coagulopathy, a high Mean systolic BP, a high Mean diastolic BP, high Cardiac frequency or a low Hemoglobin level at admission. According to the multivariate logistic analysis, the predictive factors of epistaxis despite were: male gender (OR =0.089, 95% CI [0.008-0.978], p = 0.048), history of high blood pressure (OR = 0.009, 95% CI [0.00-0.236], p = 0.005). Furthermore, the multivariate analysis excluded the effect of age, history of cardiovascular disease, or anticoagulants. *Conclusion:* The only predictive factors of epistaxis were male gender, and arterial Hypertension.
Keywords: Epistaxis, arterial Hypertension, male gender.

1. INTRODUCTION

Epistaxis is a common reason for otolaryngology emergency, representing 9.5–16% of all emergencies of the specialty [1]. its etiologies are diverse, it can be of local origin (irritation, vascular task, …) or systemic (hypertension, ...). in 15% of cases it is idiopathic .The search for factors that predispose to epistaxis has always been controversial in the literature, especially the relationship between epistaxis and high blood pressure [1].

The present study aims to describe and compare the characteristics of patients admitted to the otolaryngology emergency department for epistaxis with a control group in order to establish a model that predicts the risk factors failure of epistaxis.

2. MATERIALS AND METHODS

It was a prospective study spread over a month in the period from 01 January 2020 to 31 January 2020, within the department of otolaryngology.

Using a survey form, we collected all the patients over 17 years who presented an epistaxis, the study excluded all patients who immediately required a hospitalization in intensive care.

The initial sample was subdivided into two groups: group (1) for patients who consulted for epistaxis and group (2) for patients who had another ENT reason for consultation.

At the end of one month, the study included 161 patients who consulted in the emergency room, including 71 patients who presented for epistaxis (group 1) and therefore 90 patients had presented another ENT reason for consultation (group 2).

A comparison was made of age, sex, time of consultation, surgical or traumatic history, taking medication (anticoagulants, nasal corticoids), hemodynamic parameters (admission blood pressure, pulse, hemoglobin), between patients with epistaxis (group 1) and those who presented other symptoms (group 2)

The following comorbidities have been considered: hypertension, diabetes, dialysis, cardiovascular disease, smoking and alcoholism, hemopathies, endo-nasal surgeries and nasal trauma. As for drugs, they were asked about antiplatelet treatments, anticoagulants, anti-inflammatories and nasal corticosteroids.

Data entry and analysis was performed using Statistical Package for Social Sciences (SPSS), version 18. the two groups were independent, so to compare the quantitative variables, we used the t student test or the Mann-Whitney test and the results were presented as means +/- standard deviation or as median and interquartile range. for the comparison of the qualitative variables, the chi-square test (fisher test) was used and the results were expressed in numbers and percentage.

Univariate and multivariate logistic regression was performed to identify variables independently associated with the occurrence of epistaxis. A p value <0.05 was considered statistically significant.

3. RESULTATS

Table 1 shows the statistically significant differences between the two groups. Group 1 consisted of 71 patients, 46 were men; and group 2 had 90 patients, with 56 men. The sex difference was significant with a (p = 0.038) which means that men had significantly more epistaxis than women. In group 1, the mean age was 39 years while in the second; the mean age was 54 but not significant because the p = 0.264 was less than 0.05.

Thus, the factors whose difference is statistically significant between the two groups are: sex (p = 0.038), time of consultation (p = 0.006), presence of an history of arterial hypertension (p = 0.002) or an history of coagulopathies (p = 0.050).

Patients presenting epistaxis (group 1): the heart rate was elevated 88 ± 11 beats / min (p <0.001), and the hemoglobin level was lower with a mean of 10 ± 2 gr / dL (p = 0.001), but there were no significant differences between the two groups concerning the mean Blood Pression on admission, either systolic or diastolic. The mean systolic pressure in group 1 was 14.05 ± 3.42 and the diastolic blood pressure was 8 ± 1.52 mm Hg. In group 2 the blood pressure figures on admission were more or less within the norms. with a systolic at 12.84 ± 1.56 (p = 0.154) and a diastolic at 7.88 ± 1.07 mmHg but expression statistically not significant (p = 0.765)

Table 1: Comparison of descriptive characteristics between group 1 and group 2

Variables	Group 1 (n=71) Patients with epistaxis	Group 2(n= 90) Patients without epistaxis	p
Mean age (years) *	38.60	54	.264[a]
Gender, (%) *			**.038[c]**
Male	46 (64.7)	56 (62.2)	
Female	25 (35.3)	34 (37.8)	
Consultation season (%) *			
winter	24 (80)	6 (20)	
spring	19 (73.1)	7 (26.9)	.186[c]
summer	5 (83.3)	1 (16.7)	
autumn	4 (44.4)	5 (55.6)	
Consultation time (%) *			
day	51 (72)	45 (50)	**.006**
night	20 (28)	45 (50)	
History of (%)*			
Smoking	2 (3)	32 (35.7)	.502[d]
Alcohol	14 (20)	10(11.11)	.000[d]
High blood pressure	53 (75)	30 (33.33)	**.002**
Diabetes	5 (7)	1 (1.10)	.000[d]
cardiovascular disease	7 (10)	4 (4.40)	.077[d]
Dialysis	2 (3)	2 (2.20)	.069[d]
Coagulopathy	11 (15)	6 (6.60)	**.050**
Allergic rhinitis	18 (25)	4 (4.40)	.762[d]

nasal trauma	10 (14)	3 (3.30)	.000[d]
nasal surgery	3 (4)	1 (1.10)	.000[d]
Taking anticoagulants	10 (14)	5 (5.50)	.118[d]
Nasal corticosteroids	16 (23)	3 (3.30)	.531[d]
BP on admission mmHg ***			
Mean systolic BP mmHg	14.05 ± 3.42	12.84 ± 1.56	.154[b]
Mean diastolic BP mmHg	8 ± 1.52	7.88 ± 1.07	.765[b]
Cardiac frequency (beats/min) ***	88 ± 11	77 ± 8.27	**0.001**
Hemoglobin level (gr/dL)***	10 ± 2	12 ± 1.72	**.001**

* expressed as median and interquartile interval [a] Test Mann Whitney [d] fisher's exact test
** expressed in number and (percentage) [b] Test t -student
*** expressed as mean ± standard deviation [c] Test x^2

After this initial comparison between the two groups, a univariate logistic regression was carried out taking into account several comorbidities, which confirmed that the risk factors for epistaxis in our series are related to the male, daytime visit, history of high blood pressure (BP) or coagulopathy, elevated mean systolic BP, elevated mean diastolic BP, elevated heart rate, or low hemoglobin.

To detail our model of the patient who can consult for epistaxis; a multivariate logistic analysis was performed, the predictive factors of epistaxis are: male sex (OR = 0.089, 95% CI [0.008-0.978], p = 0.048), history of hypertension (OR = 0.009, 95% CI % [0.000-0.236], p = 0.005). In addition, the analysis excluded the effect of age, history of cardiovascular disease, anticoagulants, or history of epistaxis (Table 2).

Table 2: Results of univariate and multivariate logistic analysis[©]

	Univariate analysis			Multivariate analysis		
factors	OR	95% CI	p	OR	95% CI	p
Age[1]	0.986	[0.963-1.009]	0.231	1.049	[0.995-1.106]	0.078
Male gender*	0.256	[0.066-0.987]	**0.048**	0.089	[0.008-0.978]	**0.048**
C. during the day*	4.667	[1.501-14.508]	**0.008**	not introduced in the multivariate model		
High BP*	0.145	[0.042-0.500]	**0.002**	0.009	[0.00 -0.236]	**0.005**
cardiovascular d.*	0.230	[0.046-1.143]	0.072	0.191	[0.003-11.513]	0.428
Coagulopathy*	0.230	[0.061-0.807]	**0.031**	-	-	
nasal trauma*	0.830	[0.191-3.601]	0.803	-	-	
anticoagulants*	0.298	[0.075-1.179]	0.084	1.114	[0.035-35.282]	0.951
History of epistaxis *	0.563	[0.141-2.244]	0.415	0.334	[0.034-3.305]	0.348
Mean systolic BP [2]	0.794	[0.627-1.007]	0.057	not introduced in the multivariate model		
Mean diastolic BP [2]	0.922	[0.593-1.435]	0.719			
Cardiac frequency [2]	0.874	[0.801-0.953]	**0.002**	not introduced in the multivariate model		
Hemoglobin level [2]	1.666	[1.116-2.380]	**0.005**	-		

BP, blood pressure; d., disease; E., Epistaxis; OR, Odds Ratio; CI, confidence interval; C., Consultation
[©] dependent variable was absence of epistaxis
*Compared to the absence of the characteristic.
[1] asymmetric Continuous variable.
[2] normal Continuous variable.

4. DISCUSSION
Epistaxis is one of the most frequently encountered emergencies in the otolaryngology emergency department. Its management is an important point in the management of patients, due to their frequency and severity. Our study excluded the effect of age on the risk of epistaxis and showed an association between patients with epistaxis and male gender, or with an history of arterial hypertension or coagulopathies, on the other hand the history cardiovascular disease or taking anticoagulants were not predictors of epistaxis.

Unlike the study by FC Corte et al., Which showed a close relationship between the highest age and the occurrence of epistaxis (p = 0.002) [2].

On the other hand, the impact of male predominance was clear, which agrees with the literature. This is a factor that influences both the onset and severity of epistaxis. This phenomenon can be attributed to the protective effect of estrogen in women [2].

The association between epistaxis and hypertension is controversial [3]. Our study showed that an history of arterial hypertension was associated to the occurrence of epistaxis (p = 0.005), many studies

reported a relationship between hypertension and the occurrence of epistaxis [4]. Isezuo *et al.*, found a higher number of patients with pre-existing hypertension in the epistaxis group (32.3%) than in the control group (7.9%). They also demonstrated that the proportion of patients with elevated BP on admission was higher in the epistaxis group (87.5%) than in the control group (47.6%) and that the epistaxis group also had a prevalence significantly higher hypertension (45.2%) than the control group (13.2%) [5].

On the other hand, NA Sarhan and his colleagues showed that there was no association between hypertension and the occurrence of epistaxis, and that epistaxis was not triggered by elevated BP. However, epistaxis was more difficult to control in hypertensive patients [3]. There was a significantly higher number of attacks in patients managed by more complex procedures such as wicking, electrosurgical unit, and balloon than those managed. by first aid. The wicking (systolic PA 143.3 + 21.5 mm Hg Diastolic PA 87.9 + 10 mm Hg), electrosurgical unit (systolic PA 139.2 + 21.6 diastolic PA 86.4 + 10) and balloon (systolic PA 156.6 + 29.2 Diastolic BP 90.83 + 11.5) than those supported by first aid (systolic BP 126 + 14 Diastolic BP 86.7 + 7), these figures were statistically significant for systolic pressure admission (p = 0.021) but not significant for diastolic at presentation (p = 0.083) [3]. This result was inconsistent with what we found, there is no statistically significant difference in systolic (p = 0.154) or diastolic (p = 0.765) blood pressure on admission between the two groups with or without epistaxis.

Some studies have cited possible confounding factors related to both epistaxis and hypertension, such as age or the administration of anticoagulant drugs [6]. Some authors suggest that the relationship between epistaxis and hypertension is due to the influence of stress caused by bleeding and white coat syndrome on blood pressure. Some studies have confirmed that although hypertension does not cause epistaxis, it prolongs the episode when it occurs, making it more difficult to control with first-line measures [7].

In addition, our study showed that patients who have had epistaxis consult more during the day compared to those who consult at night (p = 0.006), which may be linked to the effort provided during labor or to the heat during the day.

The present study did not find a link between climate changes during the four seasons of the year and epistaxis (p = 0.186) which is in disagreement with the study by Gang Yu which showed a positive correlation between the frequency of epistaxis and both temperature and visibility in air and No significant correlation was found for humidity [8]. Seasonal variations could affect recurrent epistaxis. It has been shown that BP in winter is significantly higher than in summer, therefore much more recurrence in winter than in summer [9].

A history of coagulopathy has been shown as a risk factor in univariate analysis which may be justified by thrombocytopenia or a deficiency in coagulation factors encountered in these patients. First-line treatment would not be enough to stop the bleeding; it often required an associated platelet transfusion. Paradoxically, taking anticoagulants such as aspirin, anti-vitamin K or antiplatelet agents does not seem to be significantly associated with epistaxis. These results could mean that patients on anticoagulant and / or antiplatelet therapy are under close control with repetitive dosing of bleeding indicators.

Not surprisingly, in this study, patients with epistaxis had lower hemoglobinemia and higher heart rate, which makes sense since repetitive bleeding necessarily involves acute anemia. Hemoglobinemia is significantly lower than in other patients (10 g / dL versus 12 g / dL; p = 0.001).

5. CONCLUSION

This study answered the question, what are the factors that can predict epistaxis? our outcomes support an association, in univariate logistic regression, between epistaxis and male gender, consultation during the day, an history of High Blood pressure (BP) or Coagulopathy, a high Mean systolic BP, a high Mean diastolic BP, high Cardiac frequency or a low Hemoglobin level at admission. But in the multivariate model, the predictive factors for recurrent epistaxis are: male gender, history of high blood pressure. Furthermore, the study excluded the effect of age, history of cardiovascular disease, anticoagulants, or history of epistaxis. Further investigations may evaluate predictors of mortality linked to severe epistaxis.

Conflict of Interest

All authors declare that there are no financial support or relationship that may pose a conflict of interest.

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