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Analysis of laboratory parameters in non-traumatic epistaxis

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Abstract

Objective: The present study investigated the relationship between epistaxis and age, sex, hemogram and coagulation parameters and aimed to set a standard in the approach to epistaxis.

Method: Patients over the age of 18 who presented due to epistaxis between July 1, 2022, and July 1, 2023, were included in this study, and the files of these patients were examined retrospectively. Patients with trauma and chronic hypertension (HT), individuals with diseases that might predispose to bleeding and with a history of bleeding-related drug use such as coumadin derivatives or individuals with malignancy, those who were found to have active infection during the study, patients who were determined to be in the postoperative period, patients whose blood pressure was determined to be above 140/90 mmHg at the time of admission, and those who were found to have blood samples with hemolysis detected in the file records were excluded from the study.

Results: The data of a total of 100 patients, including 62 male and 38 female patients, who presented with complaints of epistaxis, were examined. It was found that more patients at older ages presented to emergency departments with complaints of epistaxis and the number of male patients with epistaxis was higher than female patients. It was concluded that headache is the most common early symptom before spontaneous bleeding in nosebleeds, which are more common in older adults, and platelet values, which are negatively correlated with age and positive correlated with activated partial thromboplastin time (aPTT) and hemoglobin (HGB) are an essential marker for nosebleeds. Furthermore, it was concluded that it is meaningless to check coagulation parameters in patients who are not coumadinized, while checking the hemogram remains important.

Conclusion: It should be kept in mind that headache is the most common early symptom before spontaneous bleeding in nosebleeds, which are more common in older adults, and that platelet values, which negatively correlate with age, are an essential marker for nosebleeds. Additionally, it was concluded that checking coagulation parameters is meaningless in patients who are not coumadinized, while checking the hemogram remains important.

Keywords: Nose bleed, hypertension, platelet, hemoglobin

INTRODUCTION

Epistaxis is a clinical condition that is frequently observed in emergency department admissions. Epistaxis, which has many different causes, can pose a life-threatening risk, although rare (1). Local factors such as trauma, foreign body, and inflammation may play a role in the etiology of epistaxis, as well as the use of some drugs, such as drugs for hypertension (HT), coagulation disorder, and anticoagulants. However, the rate of determining the exact causes is quite low (2). Various studies have investigated in which sex epistaxis occurs more commonly (3). Although epistaxis can occur in almost all age groups, it is observed more frequently at older ages (4). Epistaxis is a common clinical problem worldwide. However, since some attacks can resolve spontaneously or with self-treatment, it is difficult to determine their frequency precisely (5). Although most cases of epistaxis have mild symptoms and often resolve spontaneously, it can sometimes be life-threatening (6). Rarely, if uncontrolled, it can lead to life-threatening consequences, such as hypovolemia due to severe blood loss, cardiac failure, stroke, and aspiration (7,8). Causes of epistaxis can be local and systemic. The most common of local causes is trauma occurring through

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various mechanisms. Additionally, various infections, malignancies, and post-operative conditions may occur. Hypertension, bleeding disorders, cardiovascular diseases, and some drugs that cause bleeding may be systemic causes of nosebleeds. Digital trauma is the most common cause of local nosebleeds. Foreign objects, external trauma to the nose, and postoperative nosebleeds are the other sources of trauma (9,10).

This study investigated the relationship between epistaxis, which we frequently encounter in emergency departments, and age, sex, hemogram and coagulation parameters.

METHOD

Ethical permission was obtained from the Nigde Omer Halisdemir University, Non-Interventional Clinical Research Ethics Committee for this study with date December 12, 2023 and number 2023/127, and Helsinki Declaration rules were followed to conduct this study. Patients over the age of 18 who presented to the emergency department of Niğde Ömer Halisdemir Training and Research Hospital due to epistaxis between July 1, 2022, and July 1, 2023, were included in this study, and the files of these patients were examined retrospectively. Patients with trauma and chronic hypertension (HT), individuals with diseases that might predispose to bleeding and with a history of bleeding-related drug use such as coumadin derivatives or individuals with malignancy, those who were found to have active infection during the study, patients who were determined to be in the postoperative period, patients whose blood pressure was determined to be above 140/90 mmHg at the time of admission, and those who were found to have blood samples with hemolysis detected in the file records were excluded from the study. Laboratory tests were examined retrospectively from the file records. Hematocrit (HCT), platelet count (PLT), prothrombin time (PT), activated partial thromboplastin time (aPTT), and international normalized ratio (INR) values were examined.

In the emergency department laboratory of our hospital: HCT normal value: 36-46%, PLT normal value: 150-450 10^3/(mcl), PT normal value:(Sec(50)) 8.40-10.6 seconds (sec), aPTT: 22.6-35.4 sec, INR: 0.93-1.16.

Statistical Analysis

All statistical analyses of the research data were performed using the IBM SPSS 22.0 program. The Kolmogorov-Smirnov analysis was performed to determine the suitability of the continuous (quantitative) variables to normal distribution indicated by measurement. Student's t-test was performed for comparison of means in continuous variables. Sperman correlation analysis was applied. P<0.05 was considered significant.

RESULTS

The 100 patients with complaints of epistaxis whose data were examined included 62 males and 38 females. In this study, the number of patients aged 18-59 was found to be 38 (%38), whereas the number of patients over the age of 60 was 62 (%62). It was observed that the mean age in male patients was (64.69±17.65) and the mean age in female patients was (61.92±13.58). In this study, the most common complaint at the time of admission was headache with 82%, the second most common complaint at the time of admission was dizziness with 17%, and 1% of the patients complained of fatigue. It was determined that male patients had higher values than female patients in terms of age, INR, HGB, and HCT values (p=0.4, p=0.13, p=0.09, p=0.09, respectively), and APTT, PTZ, INR, and platelet values were higher in female patients than male patients (p=0.22, p=0.01, 0.13, respectively). It is seen that only the PTZ value was statistically significant between sexes. All these relationships are presented in Table 1 and Figure 1.

Table 1. Relationships between parameters

Group		n	Mean±Standart Deviation	P value
Male	Age	62	64.69±17.65	0.40
Female		38	61.92±13.58	
Mean		100	63.64±16.21	
Male	APTT	62	26.45±3.81	0.22
Female		38	27.58±4.76	
Mean		100	26.88±4.21	
Male	PTT	62	10.43±0.92	**0.01**
Female		38	10.9±0.89	
Mean		100	10.61±0.93	
Male	INR	62	1.11±0.17	0.13
Female		38	1.07±0.1	
Mean		100	1.09±0.15	
Male	PLT	62	214.44±47.92	0.19
Female		38	226.55±43.2	
Mean		100	219.04±46.34	
Male	HGB	62	12.97±1.74	0.09
Female		38	12.38±1.64	
Mean		100	12.74±1.72	
Male	HTC	62	38.56±5.22	0.09
Female		38	36.76±5.19	
Mean		100	37.88±5.26	

Abbreviations: APTT, Activated partial thromboplastin time; PTT, Partial thromboplastin time; INR, International normalized ratio; PLT, Platelet count; HBG, Hemoglobin; HTC, Hematocrit

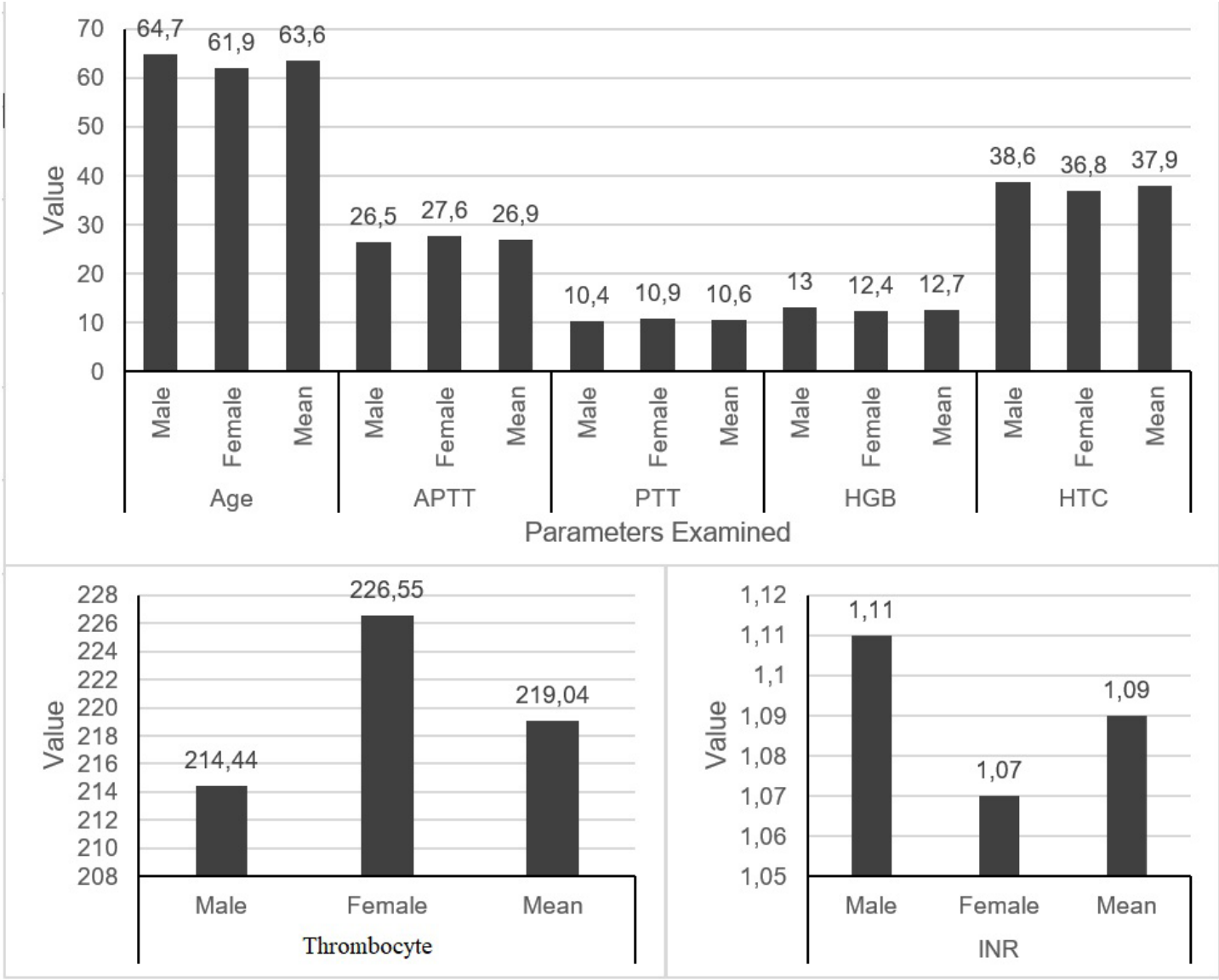

Figure 1. Relationship of laboratory parameters with age and gender.
Abbreviations: APTT, activated partial thromboplastin time; PTT, partial thromboplastin time; PLT, platelet count; HGB, hemoglobin; HTC, hematocrit; INR, International normalized ratio.

Pearson's correlation test was used to determine the correlation between quantitative data among all the parameters analyzed. The correlation analysis determined that age was negatively correlated with platelet value and platelet value was positively correlated with HGB and aPTT. Table 2 contains these correlations.

DISCUSSION

One of the important findings of this study is that coagulation parameters (PT, PTZ, aPTT and INR) do not need to be routinely checked in non-coumadinized patients.

Table 2. Correlation of platelet and different parameters

Parameters		n	Correlation coefficient	P value*
Age	Platelet	100	-0.25	0.01
APTT			0.23	0.02
HGB			0.22	0.02

*Pearson correlation; APTT, activated partial thromboplastin time; HGB, hemoglobin.

However, platelet counts are negatively correlated with age; in this context, the possibility of thrombocytopenia should not be ruled out in elderly patients presenting with epistaxis. In addition, there are various debates about the risk factors in patients with epistaxis presenting to the emergency department (7). Different studies have shown that age and sex may play a role in the etiology of epistaxis. Some studies have demonstrated that patients presenting to the hospital due to epistaxis can be of any age, but epistaxis is especially more common in individuals over the age of 50 and that the number of male patients presenting to the emergency department is usually higher than the number of female patients (11-13). In geriatric patients, systemic factors such as advanced age, bleeding disorders and hypertension are the most common causes of severe epistaxis (14). Likewise, in this study, the number of male patients (68) was higher than the number of female patients (32). However, patients with chronic diseases such as hypertension were not included in this study. On the other hand, this study had a higher proportion of elderly patients, and their coagulation values were high. In this study, the number of patients aged 18-59 was 38, whereas the number of patients over the age of 60 was 62.

Various studies investigating whether there is any correlation between nosebleeds and different blood parameters have been published recently. In a study by Ross et al. coagulapathy was found in approximately 17% of cases of epistaxis requiring intervention (15). In particular, complete blood count measurement has been used quite frequently. In contrast, some studies have reported no significant difference between hemoglobin, hematocrit, and platelet ratio and the frequency of epistaxis (16). Likewise, in the present study, we did not find a statistically significant correlation with hemoglobin, hematocrit, and platelet ratio in patients presenting with epistaxis. Various studies have also supported elevated PTZ and INR in epistaxis (17-19). However, study found coagulation markers to be within the normal range in the patient group. Furthermore, the INR value was higher in males, although it was within normal limits. Nevertheless, this difference was statistically insignificant. We think that the reason for this situation is that the study sample size was small. There are studies showing that epistaxis due to advanced age and thrombocytopenia is more common (20). Likewise, this study detected a negative correlation between age and platelet value. In this respect, this study is also compatible with the literature.

Some studies have stated that symptoms such as headache, tinnitus, and dizziness are observed due to epistaxis (21-22). This study also agrees with the literature. In the current study, the most common symptom was headache and, less frequently, dizziness and fatigue.

Limitations of the study

Undoubtedly, further studies on this subject will allow more data to be obtained. The limitation of this study is that the data were collected from a single hospital in the region. Moreover, since the study is retrospective, it limits the sample size of patients whose data cannot be accessed clearly.

CONCLUSION

It should be kept in mind that headache is the most common early symptom before spontaneous bleeding in nosebleeds, which are more common in older adults, and that platelet values, which negatively correlate with age, are an essential marker for nosebleeds. Additionally, it was concluded that checking coagulation parameters is meaningless in patients who are not coumadinized, while checking the hemogram remains important. We hope that this study will guide similar studies on the subject.

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Peer-Review

Both externally and internally peer reviewed.

Conflict of Interest

The authors declare that they have no conflict of interests regarding content of this article.

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Ethical Declaration

Ethical permission was obtained from the Nigde Omer Halisdemir University, Non-Interventional Clinical Research Ethics Committee for this study with date December 12, 2023 and number 2023/127, and Helsinki Declaration rules were followed to conduct this study.

Authorship Contributions

Concept: ÖY, AV, TD, MOC, Design: ÖM, MCA, MÖ, Supervising: UA, DA, Financing and equipment: ÖY, TD, AV, Data collection and entry: ÖY, Analysis and interpretation: ÖY, AD, TD, Literature search: MCA, MÖ, Writing: ÖY, AD, TD, MD, MCA, MÖ, Critical review: ÖY.

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