

Is Dry Climate Correlated with Hospitals Admissions for Epistaxis?

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SUMMARY

Introduction:

Epistaxis is the most frequent otorhinolaryngological emergency and is potentially life-threatening in cases of severe bleeding. A correlation seems to exist between seasonal factors and epistaxis, and the opinions are divided as to which meteorological factor is mainly responsible for nosebleeds.

Objective:

To describe the prevalence, distribution, characteristics and hospital admission due to epistaxis, and to correlate them with climatic variations. We tested the hypothesis that a dry climate is associated with an increased severity and increased number of hospital admissions due to epistaxis.

Method:

Retrospective study of epistaxis cases treated and admitted to a tertiary hospital in the Federal District of Brazil, over a 5-year period (2003 through 2007). The findings were correlated with the climatic variation data obtained from the National Institute of Meteorology (INMET).

Results:

A total of 194 patients with severe epistaxis were admitted. The mean number of admissions per month was 3.2. The largest mean number of admissions (4.8) was observed in July and the lowest number in January, with one case per month. The lowest and highest humidity was observed in August and December (43.8% and 77.1%, respectively). The mean maximum temperature was 26.9°C and the minimum temperature was 17°C. No significant correlation was observed between humidity and temperature and the number of admissions due to severe epistaxis was of ($r=0.15$, $p=0.20$).

Conclusion:

July presented the highest number of hospital admissions due to severe epistaxis and the lowest humidity was observed in August. Dry climate was not correlated with increased severity or an increased number of hospital admissions due to epistaxis.

Keywords:

epistaxis, seasonal variations, climate changes.

INTRODUCTION

The hospital admissions for epistaxis seem to have an influence of the climate conditions. Its seasonal distribution show an increased incidence during the winter, specially under climatic conditions of low moisture and temperature (1). However, there are controversies in the literature about which meteorological elements correspond to the increase of epistaxis. The nasal bleeding presents a positive correlation with the atmospheric pressure and the low relative humidity of the air. The temperature correlates with epistaxis negatively (2). Other authors show that the low temperature in association with changes in the atmospheric pressure increases the incidence of epistaxis (3).

The epistaxis of the anterior type original from the area of Kesselbach reaches mainly children and young adults, is usually self-limited and is more frequent (90% of the cases) when compared with the posterior epistaxis, generally more severe, requires internment and is more prevalent from the fifth decade of life (4). The bleeding of the nose anterior region is associated to an increase of the number of infections of the upper airways, mainly in dry months (5). The posterior epistaxis may be associated to chronic cardiovascular alterations (6,7), and its correlation with the seasons of the year is not yet confirmed in the literature. Then, such data suggest the climatic variation may interfere in a distinct manner with the incidence of the region of nasal bleeding.

Therefore, the objective of this study is to describe the prevalence, distribution, characteristics and hospital admission for epistaxis and correlate them to the climate variation.

METHOD

Retrospective analysis of the cases of epistaxis attended in a tertiary hospital of the Federal District, in the period from January 2003 to December 2007. We analyzed all records of the patients with diagnosis of epistaxis with need for hospital internment.

We obtained data regarding sex, age, origin, time of bleeding before admission, associated factors (septal deviation, surgery, pregnancy, benign and malign tumors, arterial hypertension, granulomatous diseases, sinusal diseases, coagulopathy, family history of epistaxis and medications), data from physical exam (peripheral arterial pressure and mucosas coloration), type of treatment used (anterior splint, posterior splint), need for surgery, days of internment, new splint, use of antibiotics and need for hemotransfusion.

All patients with diagnosis of epistaxis, with need for hospital internment and treatment of recurrent nasal bleeding, venous hydration and blood reposition were included. The exclusion criteria were the cases of epistaxis with a cause known, such as traumas, nasal surgery postoperative, pregnancy, use of anti-platelet, coagulopathy, family history of epistaxis, benign or malign tumors and patients out of the evaluated meteorological area.

The climate data were obtained from the National Institute of Meteorology (INMET) in the same period of the epistaxis data collection. Brasília is located at an average altitude of 1100m and the Meteorological Station of the National Institute of Meteorology (INMET), at 1159.54 meters at the latitude of 15°47'S and longitude of 47°56'W. The INMET is representative of the climatologic conditions of the city of Brasília at a range of 150 km away, comprising areas of border with the states of Bahia, Minas Gerais and Goiás. The meteorological data obtained were: daily averages of maximum and minimum temperature (Celsius grads) minimal and average relative humidity of the air (%). This information was obtained from the meteorological stations of the National Institute of Meteorology (INMET), and is set up according to the demands of the World Meteorological Organization (WMO).

In this study descriptive analyses of the variables and statistical inference were carried out. The quantitative variables were described by means of location measurements (average, medial) and dispersion (standard deviation, percentile). The statistical analysis of the correlation between variables was obtained through the Pearson's correlation, by establishing a value of $p < 0.05$ and using the software SPSS for Windows version 11.0.

The study was approved by the ethics committee of the institution under the number 016/08.

RESULTS

In the period from January 2003 to December 2007, 253 patients were admitted with the diagnosis of epistaxis. We included 194 patients in the study. Eight patients were excluded for coagulation disorder, 33 for trauma (external or surgical), 7 for use of anti-platelet, 3 for tumors and 1 for pregnancy.

As for the patients' sex, 124 (64%) were male and 70 (36%) were female. The mean age was of 53 years, minimal age of 3 years and maximal of 91 years. Eighty-four percent of the patients were original from the

Federal District and 16% from Bahia, Goiás and Minas Gerais.

Ninety-six patients were treated with anterior splint and 98 with posterior splint. The mean age of the patients was of 45 to 50 years old, respectively. Nineteen (10%) patients received blood transfusion.

In 25 patients (13%) surgical treatment was necessary. The decision for surgical treatment was the bleeding persistence after 48 at 72h of splint. Two (1%) cases operated required reintervention. There was one death due to hypovolemic shock.

Ninety (43%) patients reported a previous diagnosis of SAH.

The patients remained interned for an average of 4 days.

In Table 1, we describe the data, the average, medial calculations, minimal and maximal values and the standard deviations of the meteorological variables used in the study.

The average temperature along the years analyzed shows a stability in its values until the months of April. But from March through August, the maximal and minimal temperature have a progressive fall of up to 5 Celsius degrees. From September, the temperature recovers the stability with values close to 20 and 25 Celsius degrees at the minimal and maximal temperature, respectively, until December (Graphic 1).

The average number of admissions from 2003 to 2007 presents its highest values in March, July and August, and January is the month with the least number of interned patients (Graphic 2). We also noticed the average of admissions for epistaxis presents an isolated peak in March and then an ascending and descending curve between May and August. Likewise and in an inverse manner, we observe that the minimal humidity curve from June to September presents its minor values (Graphic 3).

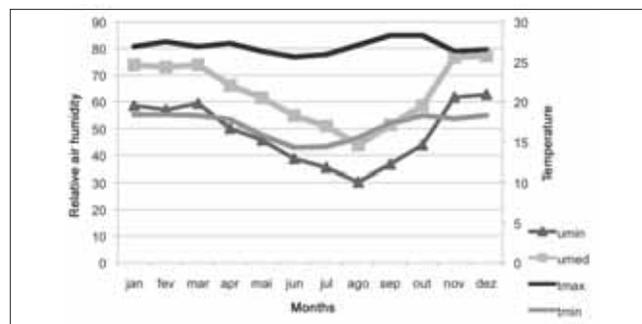
The Pearson's correlation of anterior splint with humidity was of $r=0.15$ with $p=0.20$. For the posterior splint $r=0.28$ and $p=0.07$ (Graphic 3).

The highest number of surgeries carried out for the treatment of epistaxis occurred in March and April, while in January there was no surgery along the five years (Graphic 4).

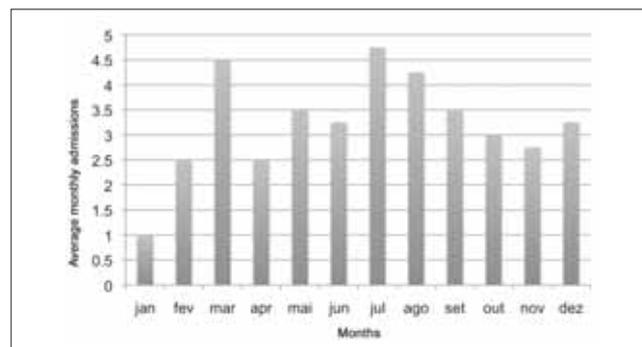
The months in which a higher number of blood transfusion in the interned patients was necessary were February, March and October.

Table 1. Descriptive analysis of the meteorological variables. Temperature (oC) and Relative humidity of the air (%).

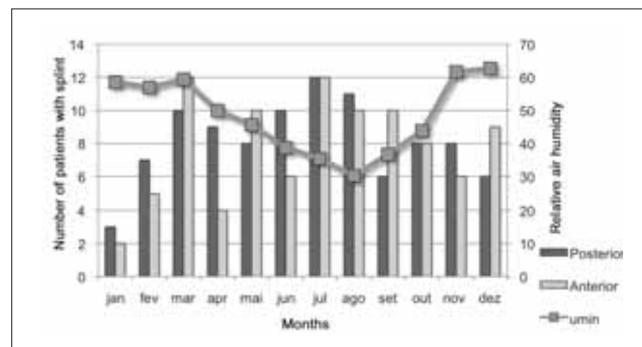
Variables	Average	Medium	Minimum	Maximum	Deviation Standard
Maximal temperature	26,9	26,9	17,4	33,8	2,23
Minimal temperature	17,0	17,5	8,2	25,0	2,1
Minimal humidity	48,2	46,0	19,0	99,0	16,6
Medium humidity	63,3	63,0	11,0	95,0	16,2



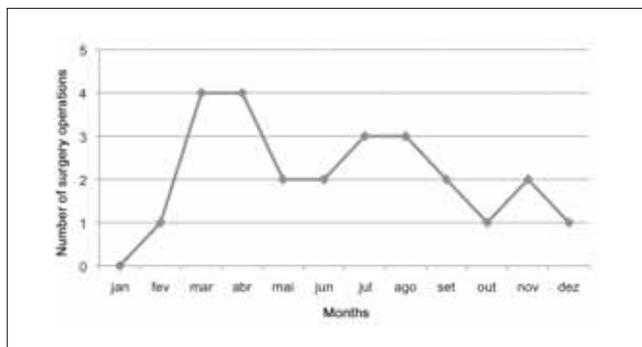
Graphic 1. Distribution of the maximal and minimal average temperatures (Celsius degrees) and maximal and minimal relative humidity of the air (%).



Graphic 2. Monthly distribution of admissions for epistaxis 2003 and 2007.



Graphic 3. Distribution of the minimal humidity average (umin) and type of splint (anterior and posterior) along the months, in the period from 2003 to 2007.



Graphic 4. Monthly number of surgeries carried out for the treatment of epistaxis between 2003 and 2007.

DISCUSSION

The patients were exposed to climate conditions typical of the Brazilian Center-West region according to the data of Table 2 and Graphic 1. This region has an influence of synoptic scale meteorological systems such as cold fronts and air masses (8). As for the seasons of the year, the Center-West region is characterized by dry falls and winters (from March 21 through September 22), because they have as their main synoptic feature the presence of a continental anticyclone (9). These anticyclones correspond to an inhibition of rains and then the fall and the winter are featured by low rates of relative humidity of the air. Moreover, the dry air favors the bush fires and many pollutants are thrown into the atmosphere (10). Such environmental conditions seem to be harmful to the human health and damage specially those who have respiratory diseases, such as the asthmatic (8) and patients with epistaxis (7,11).

In the period of 5 years of the study, 253 patients were interned, with an average of 50 patients per year, who had nasal bleeding and needed hospital admission. A similar study was carried out by BRAY et al (2005) (1) at a tertiary hospital of London, where 386 interned patients with epistaxis were evaluated in a period of 5 years. Although the region studied by the researchers (London: 2.8 million) has a population similar to that of the Federal District (2.5 million, IBGE 2007) (12), the temperate climate of the English city, with large variations of temperature and humidity along the year, is very different from the climate of the Brazilian Center-West region. Like in our study, the authors did not observe a correlation between climate variation and epistaxis.

Graphic 2 shows that the highest number of interments occurred in July, August and March. The analysis of the number of interments with the minimal humidity along the months (Graphic 3) shows that there was no

statistically significant correlation. The isolated study of the type of splint showed that both anterior splint and posterior splint don't present any statistically significant correlation with the humidity of the air. The month of March, that is typically humid and rainy, presents a number of interments similar to that of July and August, which record the lowest rates of humidity along the year.

In 1982, SMALL et al (13) studied 216 patients interned with epistaxis and noticed a seasonal distribution of its incidence, and he used the following inclusion criteria: shock, need for blood transfusion or recurrent bleeding, which were the same criteria used in this study.

Most patients was of the male sex (64%) similarly to other studies (13, 14). Some authors mention estrogen as a protection factor for nasal bleeding (15, 16, 17).

The mean age was of 53 years, minimal age of 3 years and maximal of 91 years (Table 1). In the literature, we observe the direct relation between the increase of the number of hospital admission for epistaxis and the age of the patient. This would be justified by the combination of degenerative alteration in the nasal mucosa and the hemostatic system of dependent age (14, 18, 19).

As for the type of splint, there was a similar distribution between the anterior and posterior splint, but the mean age of the patients with posterior splint is the 5th decade of life, while of patients with anterior splint is the 4th decade of life. The low quantity of children in the study was similar to that found in the literature (14, 16) probably because epistaxis in children is self-limited, interment is not common and because the severe epistaxis is more frequent in adults.

We observed that the splint was efficient in 87% of the cases and in 13% of the patients surgical treatment was necessary. In two cases surgical reintervention was required. In the literature, the surgical treatment for epistaxis ranges from 1 to 5% (20, 21) and the rate of endoscopic surgery failure in the literature ranges from 0% to 10% (20, 21, 22), which is close to what we found in our study. MONUX et al (1990) (23) also reports a death for epistaxis. The number of surgery along the months does not present a seasonal behavior, with an increase in the dry period or decrease in the rainy period.

Nineteen patients (10%) received blood transfusion, a datum that translates severe epistaxis and blood loss with hemodynamic repercussion, and erythrocytes replacement is required. The blood transfusions distribution along the months did not show a correlation with the low humidity. In the study by SMALL et al (1982) (13) 20% of the interned cases required hemotransfusion. MONUX et al (1990) (23)

reported that 16% of his patients interned for epistaxis needed blood transfusion.

Ninety patients (43%) reported a previous diagnosis of systemic arterial hypertension. LUBIANCA et al (1998) (6) studied 323 patients with diagnosis of hypertension and observed that the association of epistaxis with hypertension is due to a chronic vascular alteration. The patients studied had arterial pressured verified in the hospital urgency sector, and received influence from the environment and emotional stress. Therefore, we may not correlate epistaxis to systemic arterial hypertension in this study.

In the study we did not confirm an increase of nasal bleeding, number of surgeries or blood transfusions in the driest season. The hypothesis that the nasal septum anterior region (Kiesselbach's area) (24) would be more prone to climatic variations, compared to the nasal cavity posterior region (sphenopalatine foramen area), was not observed in this work, because the study included only cases in which internment was required. It means that the individuals with anterior bleeding who sought the emergency room and did not need internment were not evaluated, as well as those who presented with self-limited anterior bleeding, which did not require the search for medical service.

The vascular supply of the nasal cavity posterior region occurs specially through the posterior sphenopalatine and ethmoidal arteries (4, 25). The sphenopalatine trunk is covered and protected by the nasal mucosa and receives a lower influence of low humidity, which could explain the absence of correlation between cases of epistaxis and climatic variation. In the meteorological viewpoint, the information known is limited about the climate influences onto internments for epistaxis (26). In short, the epidemiological and physiological aspects of the anterior nasal bleeding may have possible influences from climatic factors and studies for verification of random hypotheses, aiming at prevention, hospital and clinical planning and treatment of this morbidity, are necessary.

CONCLUSION

The patients with epistaxis with need for hospital admission have no correlation with the seasonal variation of the humidity and temperature. The anterior and posterior bleeding types present similar prevalence with a mean age of 45 and 50 years respectively and the nasal splint was efficient in 87% of the cases. We did not confirm any correlation between low humidity of the air and increase of hospital admission for epistaxis.

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