



A RETROSPECTIVE STUDY ON THE INFLUENCE OF CLIMATIC FACTORS ON EPISTAXIS

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ABSTRACT

This retrospective study aims to search out the influence of temperature and humidity on the frequency of epistaxis. The study includes 373 patients who have suffered from epistaxis and have been treated in the ENT department of the Tezpur Medical College Hospital (TMCH), during the Jan 2017 to Dec 2019. Statistical method of Pearson's correlation analysis or simple correlation analysis was used. The results of simple correlation analysis showed that the daily number of epistaxis depend mainly on mean, maximum and minimum temperature and relative humidity. Pearson's coefficient correlation showed average correlation between both primary epistaxis and temperature ($r = -0.6336$) and relative humidity ($r = -0.6071$). The corresponding correlation coefficients are statistically significant, showing that the relationship between primary epistaxis and temperature was good while that with relative humidity was average.

KEYWORDS

epistaxis, temperature, humidity

INTRODUCTION

Bleeding from the nose or epistaxis is a common presentation in the Ear, Nose and Throat (ENT) department. Various factors are responsible for this. The source of 90% of anterior nosebleeds is within Kiesselbach's plexus (also known as Little's area) on the anterior nasal septum which is the watershed area of these five vessels from both external and internal carotid arteries. This lies at the entrance to the nasal cavity and so is subject to extremes of heat and cold, and of high and low moisture, and is easily traumatized. The mucosa over the septum in this area is especially thin, making this the site of the majority of epistaxis. The branches of sphenopalatine artery and posterior ethmoidal branch of ophthalmic artery are responsible for 80-90% posterior bleeds. As the sphenopalatine artery penetrates through the sphenopalatine foramen, it breaks into a number of branches, the primary being responsible for posterior bleeds (Woodruff's plexus). It has been observed that 60% of the people experience at least one episode of epistaxis in their life time and 6% seek medical attention for this condition¹. The incidence of epistaxis at the hospital is more during the dry and cold seasons². This seasonal variation correlates with fluctuations in the environmental temperature³. Most research in the literature support that there is a correlation between the frequency of epistaxis and at least one of the meteorological factors i.e. temperature, humidity. However, the studies done on this topic are still few. There are various classifications for epistaxis. It is clinically classified as primary or idiopathic if there is no proven cause and secondary if there is a definite identifiable cause. It is also classified according to age as childhood and adult. Another way of classifying epistaxis is based on the site of bleeding, where the bleeding can be anterior or posterior⁴. The causes of epistaxis are local and systemic. A careful history, physical examination and laboratory assessments are required for proper diagnosis. This study was done to observe the frequency of primary epistaxis at Tezpur Medical College Hospital (TMCH) and its correlation to the seasonal variations of temperature and relative humidity.

MATERIALS AND METHODS

Three hundred and seventy three (373) patients were included in the study who attended the Ear, Nose and Throat (ENT) Department, TMCH between the period from January 2017 to December 2019 in a retrospective study. The study group comprised of both outdoor and admitted patients. Out of 373 patients, 106 cases were primary epistaxis. Rest of the 267 patients were cases of secondary epistaxis of which 121 were associated with hypertension, 97 associated with trauma, 18 cases had diabetes mellitus and 21 had chronic liver disease. There were 17 cases of epistaxis in children which included foreign body and nose picking. 106 primary epistaxis cases were considered in the study and the rest of the cases were excluded. Daily temperature and humidity as documented by the Meteorological department in the area were recorded during this study period. The daily arithmetic

averages (mean) of temperature and humidity were taken from which the mean monthly temperature and relative humidity were calculated. The frequency of epistaxis on a monthly basis was recorded and the seasonal variations were observed. The relation between the number of epistaxis events and the above meteorological factors was investigated using simple linear correlation equation.

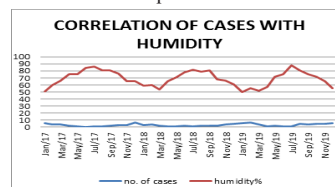


Figure 1- incidence of cases month-wise (2017-2019)

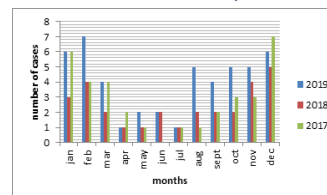


Figure 2- correlation between number of cases and average humidity% 2017-2019

RESULTS

A retrospective study showed that 373 total cases of epistaxis attended the department of ENT, TMCH out of which 106 (28.4%) cases were found to be primary. Out of the 106 patients who had primary epistaxis, 65 (61.3%) were male and 41 (38.7%) were female. The age ranged from 9 to 71 years, with the highest number of cases being in the 50 to 59 years age group. The mean age of the patients was 39 years. Out of these, 17 cases (16.03%) were children, below 12yrs and the rest i.e. 89 cases (83.97%) were adults. Anterior epistaxis was found to be the most common, which accounted for 96 (90.56%) of the cases and there were 10 cases (9.44%) of posterior epistaxis. The study was designed to look at the effect of temperature and humidity on primary epistaxis. Number of cases presenting every month from January 2017 to December 2019 with primary epistaxis was observed. The figures suggest that the number of cases attending ENT OPD with primary epistaxis were found to be high from August to March of the succeeding year and low from April to July.

The results of simple linear correlation (Pearson's coefficient) was applied to compute the relationship between the two variables (primary epistaxis and the temperature) and the linear correlation coefficient value was found to be $r = -0.6336$ and $r = -0.6071$ between

epistaxis and relative humidity. This shows that both meteorological factors have average to good correlation and influence on primary epistaxis.

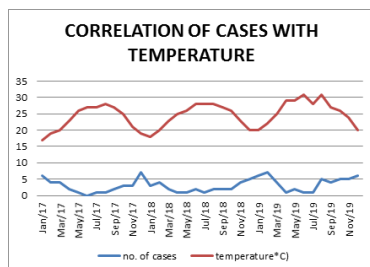


Figure 3- correlation between number of cases and average temperature(0C) 2017-2019

DISCUSSION

Epistaxis is a reasonably common symptom encountered in our Otolaryngological experience. Most cases of epistaxis have identifiable causes which are known secondary epistaxis but some have idiopathic causes known as primary epistaxis. In our study of 373 patients, 106(28.4%) cases were of primary epistaxis with no apparent causes. This is in accordance with a study done by Varshney S and Saxena RK which showed 35.23% cases to be of primary epistaxis⁵. In our study the age group found to be affected the most was between 50–59 years of age which corroborated the fact by various studies that epistaxis is essentially a problem of elderly population. Male preponderance has been found out in many studies^{3,5} in the literature and our study is no different in that respect (M:F=1.58:1). In our study the frequency epistaxis is seen to be more during the cold period, which is from the months of August to March. The maximum number of cases were observed in the months of December to February. However, the incidence declined from April to July. Seasonal variations were also seen in a study which showed the number of epistaxis were more in autumn and winter seasons (September to March)⁶ similar to our study. Our study showed that there is a good correlation between epistaxis and average monthly temperature and average relation with relative humidity. Pearson's coefficient correlation between two variables (cases of epistaxis and temperature) was $r = -0.6336$ and that for humidity was $r = -0.6071$. The negative coefficients indicate that low temperature and low amounts of water vapour in the atmosphere, in general, can be responsible for higher numbers of epistaxis events. This relation is also apparent in Fig. 2 & 3, in which histograms of mean daily number of epistaxis events for various temperature and relative humidity classes are presented.

CONCLUSION

In our study 28.4% patients accounted for primary epistaxis. There was a male preponderance (M:F=1.58:1) and the number of cases were seen to be higher in the age group between 50-59 years. The frequency of primary epistaxis was seen to be higher during the cold period of the year and it was found that there is an average correlation between epistaxis, temperature and relative humidity. This study leads to the conclusion that there is a statistically significant influence of weather on epistaxis. Simple linear correlations showed that, the factors mainly affecting epistaxis are mean, maximum and minimum daily temperatures and relative humidity. The influence of weather on epistaxis is greater during the cold period of the year and especially under very cold and very dry conditions, but starting to improve as the moisture quantity of the atmosphere increases.

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