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## EPISTAXIS AND ITS RELATION WITH TEMPERATURE AND HUMIDITY

### Objective:

The objective of this study was to observe the frequency of primary epistaxis and its relation with temperature and relative humidity.

### Materials and Methods:

This was a prospective study which included 262 patients with epistaxis attending the Department of ENT and Head & Neck Surgery of Nepal Medical College Teaching Hospital (NMCTH) from August 2008 to July 2010. Out of these 262 patients, 105 with primary epistaxis were included in the study. Daily temperature and relative humidity for the period were recorded from the Department of Hydrology and Meteorology of the Government of Nepal. Pearson's coefficient correlation was applied to see the relationship between the frequency of primary epistaxis with variation of temperature and relative humidity.

### Results:

Out of a total of 262 patients attending the outpatient department, 105 (40.07%) had primary epistaxis. The frequency of primary epistaxis was seen to be higher during the cold period from September to March. Pearson's coefficient correlation showed good correlation between primary epistaxis and temperature ( $r = -0.695$ ) and average correlation with relative humidity ( $r = -0.550$ ).

### Conclusion:

The relationship between primary epistaxis and temperature was good while that with relative humidity was average.

**Keywords:** epistaxis, temperature, relative 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 nose bleed. 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 condition.<sup>1</sup> The incidence of epistaxis at the hospital is more during the dry and cold seasons. The frequency of admission is greatest in the autumn and winter months.<sup>2</sup> This seasonal variation correlates with fluctuations in the environmental temperature.<sup>3</sup> In the few reports found in literature, most research supports that there is a correlation between the frequency of epistaxis and at least one of the meteorological factors i.e. temperature, humidity and atmospheric pressure. However, the studies done on this topic are still few. There are various classifications for epistaxis. It is clinically classified as primary 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 posterior in relation to the piriform aperture.<sup>4</sup> 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 Nepal Medical College and Teaching Hospital (NMCTH) and its correlation to the seasonal variations of temperature and humidity.

### MATERIAL AND METHODS:

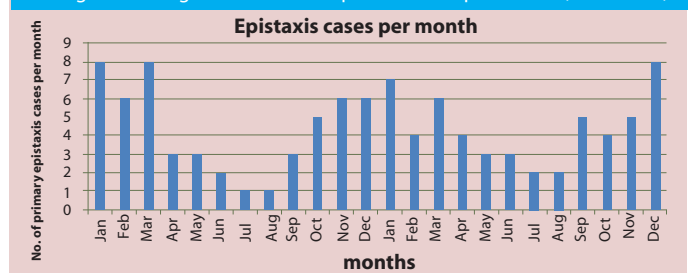
Two hundred and sixty two consecutive patients attending ENT outpatient department of Nepal Medical College and Teaching Hospital (NMCTH) with nose bleed were included in the study. The study period was 2 years from August 2008 to July 2010. The study group comprised both hospitalised and not hospitalised patients. Nose bleed without any known cause or primary cases of epistaxis were included in this study. The exclusion criteria were patients with obvious causes for epistaxis, patients with trauma, coagulopathies, tumours and systemic causes. Out of 262 patients, 105 cases were primary epistaxis. Daily temperature and humidity as documented by the Department of Hydrology and Meteorology of the Government of Nepal 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. Statistical analysis with Pearson's correlation coefficient was used to see the correlation between

frequency of epistaxis and its variation with temperature and humidity. Data were analysed to observe the frequency of primary epistaxis and its relation to seasonal variations of temperature and relative humidity.

### RESULTS:

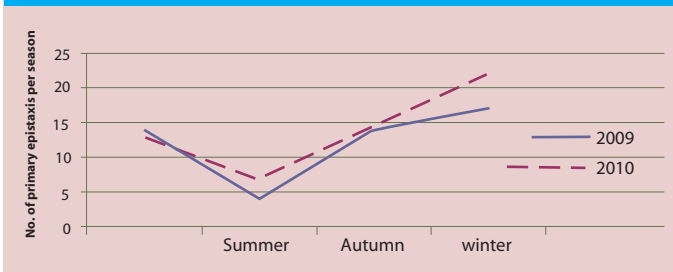
A total of 262 cases of epistaxis presented at the ENT out-patient department of NMCTH out of which 105 (40.07%) cases were found to be primary. Out of the 105 patients who had primary epistaxis, 66 (62.8%) were male and 39 (37.14%) were female. The ratio between males and females was 1.6:1. The age ranged from 3 to 72 years, with the highest number of cases being in the 40 to 49 years age group. The mean age of the patients was 33 years. Out of these, 13 cases (12.38%) were children, below 16yrs and the rest i.e. 92 cases (87.62%) were adults. Anterior epistaxis was found to be the most common, which accounted for 96 (91.43%) of the cases and there were 9 cases (8.57%) 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 for two consecutive years with primary epistaxis was observed. The figures suggest that the number of cases attending ENT OPD with nose bleed were found to be high from September to March and low from April to August (Fig.1).

Fig.1: Showing distribution of epistaxis cases per month (2009-2010)



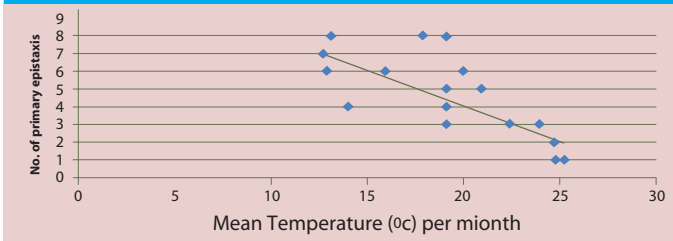
Seasonal variations were also noted in the study. The number of cases presenting during the spring and the summer seasons were comparatively lower but this was seen to rise with the advent of autumn and during winter (Fig. 2). The maximum numbers of cases were seen during the months of December and January (Fig. 1). Pearson's coefficient correlation was applied to compute the relationship between the two variables ( primary epistaxis and the

Fig.2: Showing seasonal variation of epistaxis



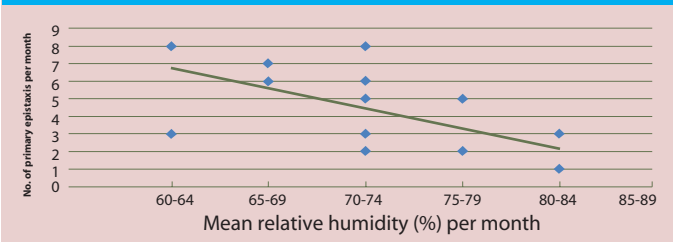
temperature) and the linear correlation coefficient value was found to be  $r = -0.695$  (Fig. 3).

Fig.3: Showing the correlation between the epistaxis and the temperature



The study showed that there was a good correlation between primary epistaxis and the temperature. Similarly the linear correlation coefficient value after substituting relative humidity for temperature was found to be  $r = -0.550$ , which showed average correlation between primary nose bleed and relative humidity (Fig. 4).

Fig.4: Showing correlation between the epistaxis and relative humidity



## DISCUSSION:

Epistaxis remains the most common ENT emergency.<sup>5</sup> Most cases of epistaxis have identifiable causes (secondary epistaxis) but some do not (primary epistaxis). In our study of 262 cases of epistaxis, 105 (40.07%) cases were primary epistaxis. Razdan et al, found primary epistaxis in 16.5% indoor and 26.1% in outdoor cases.<sup>6</sup> A study done by Varshney S and Saxena RK showed 35.23% cases to be of primary epistaxis.<sup>7</sup> However, Adhikari et al, had only 24.7% of patients presenting with primary epistaxis.<sup>8</sup> The male to female ratio of primary epistaxis was 1.6:1. Male preponderance were also seen in other studies.<sup>3,9,10</sup> In our study the age group found to be affected the most was between 40–49 years of age, with the mean age being 33 years. Frequency of epistaxis was seen to rise during the cold period. This maybe due to the fact that in this period of the year, the air is relatively dry owing to the low humidity. Apart from this during the cold season there is also a difference of the temperature and humidity prevalent outside and inside warm heated homes. This may lead to drying of the nasal mucosa, making it fragile and hyperaemic leading to crusting and nasal bleeding as suggested by Randall DA and Freeman SB.<sup>11</sup> In our study the frequency of nose bleed is more during the cold period, that is from the months of September to March. The maximum number of cases were observed in the months of December and January, however, the incidence of nose bleed declined from April to August. Seasonal variations were also seen in a study which showed the number of epistaxis were more in autumn and winter seasons (September to March).<sup>12</sup> Similarly in another study the highest occurrence of epistaxis were observed during the months between December to April.<sup>10</sup> Likewise in our study the maximum numbers of primary epistaxis were seen in the months of December and January. The study conducted by Danielides et al used simple linear

correlation and linear stepwise regression analysis in which the analysis showed that daily number of epistaxis depends mainly on mean, maximum and minimum temperature and water vapour pressure.<sup>3</sup> Tomkinson et al, showed that there was a marked increase in hospital attendance during colder days, where patients were admitted at a rate of 0.829 patients per day for temperatures less than 5 degree celsius (95% Confidence Interval: 0.737-0.928), compared with 0.645 patients per day between 5.1 and 10 degrees celsius, (95%.586-0.708).<sup>13</sup> Lewandowski et al, revealed that highest occurrence of epistaxis was observed during the cold season between December and April (from 9.2 to 13.36% of all patients seen per month).<sup>10</sup> Our study showed that there is a good correlation between epistaxis and ambient temperature and average relation with the relative humidity. Pearson's coefficient correlation between two variables (cases of epistaxis and temperature) was  $r = -0.695$  and that for humidity was  $r = -0.550$ . In contrary Bary et al, showed that there is no correlation between ambient temperature, seasonal preponderance, presentation rate or admission rate for patients with primary epistaxis.<sup>14</sup> Though our study demonstrated that temperature and humidity play an important role in the aetiology of primary epistaxis. However, it must be emphasised that further studies need to be done with more sample size to come to a definite conclusion regarding the effect of meteorological factors on primary epistaxis.

## CONCLUSION:

In our study 40.07% patients accounted for primary epistaxis. There was a male preponderance and the number of cases were seen to be higher in the age group above sixteen years. The number of patients with primary epistaxis were more common between the age group 40-49 years. Episodes of anterior epistaxis were more commonly encountered than posterior epistaxis. The frequency of primary epistaxis were seen to be higher during the cold period of the year and it was found that there is a good correlation between epistaxis and temperature. However this correlation was seen to be average when relative humidity was taken into account.

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