Epistaxis and Staphylococcus aureus colonization in nasal vestibule: Is it cause or consequence?

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ABSTRACT

Objective: To investigate the relation with epistaxis and nasal colonization of Staphylococcus aureus in a population of patients with recurrent epistaxis.

Study Design: A prospective case-control study.

Subjects and Methods: Three hundred and sixty one men and women were recruited, 245 with epistaxis (114 had crusting in the nasal vestibule; 131 did not) and 116 control subjects. A microbiology swab was taken from the anterior nasal cavity of each subject.

Results: S. aureus was found to be more common in the epistaxis group when compared with the control group with a percentage of 31.8% and 4.3% respectively ($p<0.05$). There was no difference in the prevalence of S. aureus between crust and non-crust groups ($p>0.05$). When positive cultures grouped and compared according to season, it is observed that the positive culture with epistaxis was much higher (44.82 %) in autumn period.

Conclusion: Staphylococcus aureus colonization in nasal vestibule is more likely to be observed in individuals who have recurrent epistaxis than those who do not have. It seems that this colonization may have a role in the etiology of epistaxis. However with an altered medium of nasal vestibule after each epistaxis period, it is also possible to speculate that this colonization is may be the consequence of epistaxis itself.

Keywords: Epistaxis, Staphylococcus aureus, nasal colonization, seasons

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INTRODUCTION

Epistaxis is a disturbing condition that may arise from either anterior or posterior parts of the nasal cavity. In over 80% of cases, the etiology remains unclear, with the remainder being attributed to facial trauma, anticoagulants or hematologic diseases. A proportion of idiopathic cases can be attributed to the use of antiplatelet agents such as non-steroidal anti-inflammatory drugs and also alcohol. Bimodal age distribution of epistaxis is generally parallel with the site of the bleeding. While anterior epistaxis seen more frequently in pediatric age group (younger than age 10) , posterior ones are generally seen in adults (age 70 to 79 years). Various local or general factors are associated with epistaxis. While systemic problems as hypertension and diabetes mellitus are associated with posterior bleedings, local problems as digital trauma and nasal infections are related with anterior epistaxis, especially in the pediatric age group. As a general rule, any kind of infection or inflammation is related with vascular congestion and neo-vascularization on the effected tissue. These local factors are mainly inducing new vessel formation at Little's area and increasing vulnerability to the local trauma in cases of anterior bleedings.

METHODS AND MATERIALS

A prospective case control study was carried out on 245 patients who attended to the Otorhinolaryngology Clinic of Çorlu State Hospital between September 2011 and July 2013 with a complaint of recurrent epistaxis. One hundred and sixteen age matched healthy subjects who do not have any prior epistaxis history in last 1 month were recruited as a control group. The ethic committee of the institution approved the study protocol, and all participants or their parents provided informed consent. Standard physical examinations with rhinoscopy anterior and rigid nasal endoscopy have been performed and patients were categorized with crusting or no crusting in the nasal vestibule. Patients not eligible for the study were those who had completed a course of antibiotics within the previous month, those patients already prescribed antiseptic nasal cream and patients who had had an upper respiratory tract infection (URTI) in the preceding month. Patients were excluded from the control group if they had a history of nose bleeding or additional exclusion criteria as mentioned previously. A standard microbiology swab was moistened with sterile 0.9% saline solution before swabbing the anterior nasal cavity under direct vision. Crusts were removed before the swab was taken. This swab was then sent to the microbiology department where the swab was plated and cultured in 5% blood agar for 24 hours.

RESULTS

Two hundred and forty five consecutive patients (156 men and 89 women with a mean age of 29.7±21.2 years) with recurrent epistaxis and 116 control subjects (75 men and 41 women with a mean age of 31.4±20.4 years) who have met the inclusion criteria were the subjects of this study. Of the patients with epistaxis, 114 had crusts in the anterior nasal cavity or nasal vestibule and 131 did not. Sex and age characteristics of epistaxis and control group were similar and summarized at table-1.

Of the 245 patients with epistaxis, 95 (38.7%) had positive culture for S aureus. Of the 116 subjects in control group only 5 (4.3%) had positive culture for S aureus (Table 2). The differences of the proportions of having positive culture for S aureus were statistically significant between epistaxis and control groups ($p<0.05$). Analysis of the epistaxis sub groups showed that patients with crusts are more likely to have positive culture than patients without crusts ($p<0.05$) (Table 3). When positive cultures grouped and compared according to season, it is observed that the positive culture with epistaxis was much higher (44.82 %) in autumn period.

Groups	Positive culture	Negative culture
Epistaxis group (n=245)	95 (38.7%)*	150 (61.3%)
Control group (n=116)	5 (4.3%)*	111 (95.7%)

	Positive culture	Negative culture
With Crust (n=148)	67 (58.7%)*	47 (41.3%)
No Crust (n=97)	28 (21.3%)*	103 (78.7%)

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DISCUSSION

Although numerous etiologic factors have been defined in the occurrence of epistaxis,[1] the association between bacterial colonization of nasal cavity and epistaxis was brought a new perspective to this disturbing condition. As Saafan et al. mentioned in their study, patients with an epistaxis are more likely to have pathogens in their nasal cavity than patients without epistaxis.[2] In this study S aureus was the most common pathogen microorganism detected by fluorescence in situ hybridization (FISH) and culture. In our study we also observed that patients who have recurrent epistaxis are more likely to have S aureus colonization in their nasal cavity than patients without epistaxis. These findings are in agreement with Whymark et al. in their series of 42 children with epistaxis, where a microbiology swab was taken and cultured.[3] They reported that children with epistaxis are more likely to have nasal colonization with S aureus than individuals without epistaxis [4]. Furthermore in this study Whymark et al. mentioned that to have a nasal cavity with or without crust has no clinical impact on having S aureus colonization in nasal cavity. However our findings revealed that patients who have nasal crusting are more likely to have S aureus colonization than patients without crust.

CONCLUSIONS

Staphylococcus aureus colonization in nasal vestibule is more likely to be observed in individuals who have recurrent epistaxis than those who do not have. It seems that this colonization may have a role in the etiology of epistaxis. However with an altered medium of nasal vestibule after each epistaxis period, it is also possible to speculate that this colonization is may be the consequence of epistaxis itself. It seems that topical antiseptic creams have an important role in the treatment of such refractory cases with anterior epistaxis, especially who have nasal crusting.

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