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FREQUENCY OF FUNGAL INFECTIONS IN NASAL POLYPI.

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ABSTRACT… Objectives: Determine the frequency of fungal infections in nasal polypi. **Study Design:** Cross sectional study. **Setting:** Histopathology Department at Shaikh Zayed Hospital Lahore. **Period:** Six months from 12/2/2015 to 12/8/2015. **Material & Methods:** Two hundred surgical resections/biopsies using 95% confidence level, with 7% margin of error were collected. Formalin fixed specimens of patients of both genders and 10- 60 years of age with nasal polyps received after surgical procedure in department of ENT. Grossing and processing was done. Hematoxyin & Eosin stained sections were examined by two consultant Histopathologists independently. The presence of fungal hyphae was confirmed by PAS and Silver stains. The study was approved by College of Physicians & Surgeons Pakistan. All the data was entered and analyzed by using SPSS version 20. **Results:** Out of 200 patients all the patients showed the prescence of inflammatory cells in polyps (100%) with predominantly eosinophils in their submucosa (82%). Fungus was present in 48 cases (24%) most of them were in the age group of 42-57 years (13%) and 31(15.5%) patients having BMI <30 and 17(8.5%) having BMI >30 were positive for fungus.30 cases were of Aspergillus (62.5%) and rest 8 were of Mucor (37.5%). The fungus positive cases were more in males (13.5%). 160 of the cases were of unilateral polyps (80%) and 40 were of bilateral polypi (20%). Only 8% of the patients having diabetes had fungal infection. **Conclusion:** Hence, the frequency of fungal infection in nasal polypi is low with Aspergillus being the commonest pathogen affecting males predominantly.

Key words: Aspergillus, Fungal Infection, Mucormycosis, Nasal Polyps.

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INTRODUCTION

Nasal polyps are a common health problem encountered daily by otolaryngologists. Its prevalence is 1-4%.[1] Chronic rhinosinusitis with nasal polyps can be divided into eosinophilic chronic rhinosinusitis and nasal polyps with associated neutrophil inflammation like in cystic fibrosis.[2] Eosinophilic chronic rhinosinusitis is the most common one. It includes allergic fungal rhinosinusitis, eosinophilic mucin rhinosinusitis and aspirin exacerbated respiratory disease.[2]

Fungal infection of nose and paranasal sinuses especially associated with nasal polyps was considered to be rare but now it is not so. The diagnosis can be made even in immunocompetent individuals.[3]

The fungal infection can be classified into invasive and non-invasive. The non-invasive type is saprophytic one which progresses as asymptomatic sinus infection and may progress to form fungal balls. Only histopathological examination can tell about subepithelial fungal infection and invasion so this examination is crucial.[4] The nasal polyps can be unilateral or bilateral. The diagnosis of nasal polyps is based on nasal endoscopy, X-ray, CT, MRI. However, definitive histopathological diagnosis by using hematoxylin and eosin stains and special stains like Gomorri Methylamine Silver and Periodic Acid Schiff is required for exact treatment of patient. As a wide gap of frequencies persists in literature including national and international, so further research is required to evaluate the exact frequency of fungal infections in nasal polyps. The objective of the study was to determine the frequency of fungal infections in nasal polypi.

MATERIALS AND METHOD

This cross sectional study, approved by College of Physicians and Surgeons Pakistan, was conducted for six months from 12/2/2015 to 12/8/2015 in Histopathology Department at Shaikh Zayed Hospital Lahore. It was estimated as 200 surgical resections/biopsies using 95% confidence level, with 7% margin of error taking an expected percentage of fungal disease as 69% in patients presenting with nasal polyps.[5] Formalin fixed specimens of patients of both genders and 10- 60 years of age with nasal polyps received after surgical procedure in department of ENT. Grossing and processing was done. Hematoxyin & Eosin stained sections were examined by two consultant Histopathologists independently. The presence of fungal hyphae was confirmed by PAS and Silver stains. All the data was entered and analyzed by using SPSS version 20.

RESULTS

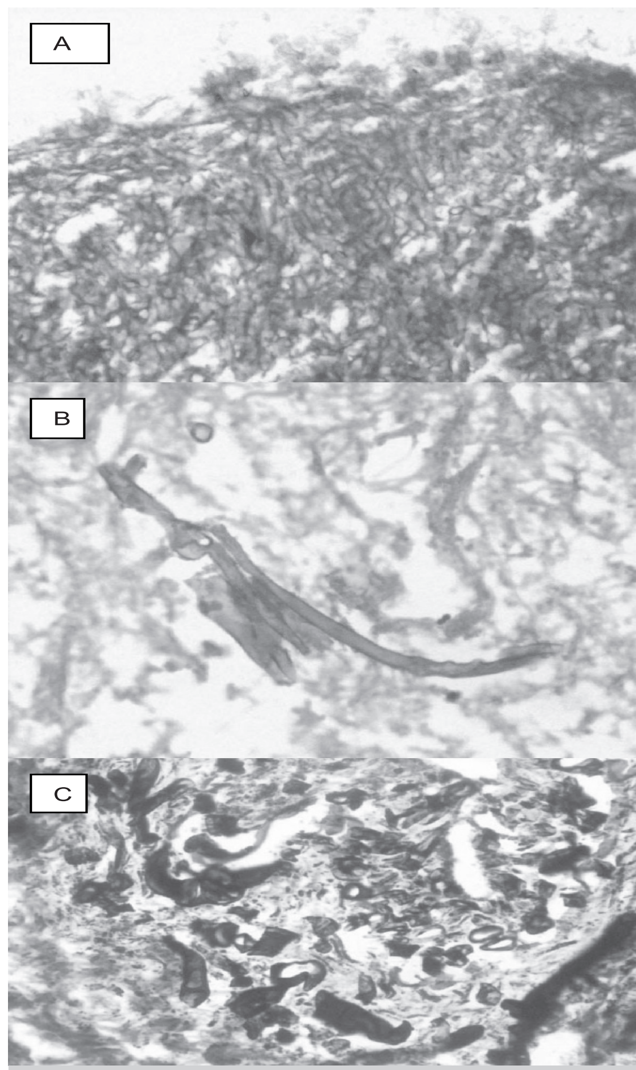
Out of the 200 patients entered in this study 118 males and 82 females with age range is between 10 to 60 years. The age of the patients ranged from 11 to 60 years. The mean age was 38.27+ 13.23 years. In this study, there were 118 males (59%) and 82 females (41%).The male to female ratio was 1.43:1. Microscopic abnormality was seen in all the specimens. All the specimens showed the presence of Polypoidal nasal mucosa with chronic inflammation in all cases (100%), eoinophils in 140 cases (70%) and presence of fungus in 48 case (24%). Out of these 30 were aspergillus (62.5%) and the rest of cases (18) were of mucormycosis (37.5%). The presence of fungal hyphae was confirmed by PAS and Silver stains which revealed more pronounced septate fungal hyphae and eosinophilic spores of Aspergillus on PAS and non septate ribbon like brown hyphae of Mucor on Silver stain. Total of 160 patients (80%) has unilateral polyps and 40 had bilateral polyps (20%).Most of the patients were males with fungus positive in their biopsies 27(13.5%).Out of diabetics 53(26.5%), only 16(8%) had fungus. BMI seems to have an impact on fungal infection as patients having BMI >30 were 57(28.5%) had more fungal infections 17(8.5%).

Age (Years)	Fungus	
	Positive	Negative
10 – 25	3 (1.5%)	32 (16.0%)
26 – 41	15 (7.5%)	60 (30.0%)
42 – 57	26 (13.0%)	47 (23.5%)
>57	4 (2.0%)	13 (6.5%)
Chi-square	= 53.906, df = 42, p = 0.103.	

Table-I. Stratification of fungus according to age of patients, (n=200)

Body Mass Index	Fungus	
	Positive	Negative
<30	31 (15.5%)	112 (56.0%)
>30	17 (8.5%)	40 (20.0%)
Chi-square	= 34.468, df = 29, p	= 0.259.

Table-II. Stratification of fungus according to body mass index (BMI), (n=200)



Images: A. Showing spores and hyphae of aspergillus (H&Ex40). B. spores and hyphae of mucor (H&Ex40). C. spores and hyphae of mucor. (Silverx40)

DISCUSSION

Nasal polyps are a common clinical entity. The prevalence of nasal polyps is 1-4% in general population and as high as 40% in cadavers. These polyps are commonly seen in adults and less commonly in children especially less than 10 years of age. Adults who are exposed to air pollutants and use more antibiotics are more prone to suffer from nasal polyps. These nasal polypi are usually associated with allergy, viral infection, bacterial infection, fungal infection and environmental pollution.[6]

In a study conducted by Attif hafiz Siddiqui et al observed, 51% in female and 49% in males with a M:F of 1:0.9, in comparison to which we found 59% male and 41% female with M: F ratio of 1.43:1.[5] A study stated almost equal gender proportion with slight female predominance, 46% males and 54% females.[7] A study conducted at Peshawar quoted, maximum number of their patients were in 20-29 years of age.[8] A study reported an increased incidence of 62 % in 21-40 years of age group, which is in comparison to the present study.[9,10] We observed 15 (7.5%) in the same age group whereas the highest number of patients were in 42-57 years 26 (13%). A study found 25.74±9.64 years (mean ±SD) of patients with nasal polyposis.[5] Our study comprised of 80% of unilateral polyps which is comparable to Srivani et al’s and Wahid et al’s study as 92% & 72% respectively.[8,11] Another study showed, 43.8 % of patients had unilateral polyps and 56.2% had bilateral nasal polyps.[5]

The first case of fungal infection of nose and paranasal sinuses was reported by Miller in 1981 as aspergillosis. Since then the number of cases reported as fungal infection of nose and paranasal sinuses have increased dramatically. These fungi cause formation of polypi and may also extend intracranially and erode skull base. Invasion and erosion of lamina papyracea causes proptosis, visual impairment and other eye symptoms. If fungus is the cause of nasal polyps then chances of recurrence are increased many folds.[5] Recent estimates show a high burden of serious fungal infections of 1.78%.[12]

In a study carried out at Dow Medical College and Civil Hospital Karachi a total of 324 patients were taken. Underlying fungus was present in 226 (69.75%) and out of them, 102 (45.13%) were males and 124 (54.86%) were females with a p value of 0.039.[5] In a study carried out in Iran 98 patients were examined and fungus was found in 8 cases who underwent nasal polypectomy (8.1%).[5,13] A study carried out in King Fahd Hospital Saudi Arabia revealed positive fungus in 11 of 91 patients (12.1%).[14] A study found 70 % of fungal infection in patients with nasal polyps.[15]

In a study carried out at Avicenna Medical College Lahore 242 patients diagnosed as chronic rinosinusitis were taken. Sixty seven of these had clinical and radiological evidence of fungal infection but only 24 of these had fungus identified (9.91%).[3] In present study, we found fungus in 27(13.5%) males and 21(10.5%) of female group. The maximum number of fungus infected patients in the present study were between 42-56 years of age (n= 26, 13%). However, a study showed mean age was 25.95 + 9.32 (15-45) years of patient with fungus.[5] In our study, out of 200 cases of nasal polyposis, 48 (24%) were fungus positive on histological examination, confirmed on PAS and Silver histochemical stains. Siddique at el reported 69.75% fungus positive cases, among which they found Aspergillus in 73.45%, which is also higher in the present study as 62.5 % followed by mucomycosis in 37.5%.[5] Aspergillus was the commonest organism found, similar to our research. Another study found Out of 70 cases, 45 (64.3%) patients were suffering from aspergillus species.[7] In contrary to our finding, Mucor was the most commonly identified fungus in as many as 15 patients (50%), followed by Aspergillus in 13 patients (43.3%), and Candida species in 9 patients (30%) in our study.[16] Chakrabarti et al. in north India, found that the most common species that caused fungal rhinosinusitis was Aspergillus.[16]

We found out of diabetics 53(26.5%), only 16(8%) had fungus. Our observation is nearly similar to an Indian study in which 12 % of patients had diabetes mellitus out of 100.[16]

CONCLUSION

The frequency of fungal infection in nasal polypi is low with Aspergillus, being the commonest pathogen affecting males predominantly.

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3	Nausheen Henna	Proof reading and editing.	Nausheen Henna
4	Shireen Hamid	Review of manuscript.	Shireen.
5	Saniyah Ali	References collection.	Saniyah Ali
6	Saroash Iqbal	Data analysis.	Saroash Iqbal.