

To Determine the Type of Fungus Involved in Fungal Nasal Polyps

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ABSTRACT

Aim: To determine the type of fungus involved in fungal nasal polyps.

Setting: Specimens were taken from ENT Department of Abbasi Shaheed Hospital and Karachi Medical & Dental College and processed in Microbiology department for fungal involvement. Among these specimens 59 culture positive cases were included in the study

Methods: Specimens were processed for the diagnosis by KOH mount for microscopic evaluation and mycological culture to determine the fungal involvement and type of fungus respectively.

Fungal culture was done using Seaboard's dextrose agar at 25 °C and at 37 °C. It was observed periodically for the growth for 4 weeks. If the growth was present then the pathogen was identified by cultural characteristics and microscopy.

Results: Fifty nine culture positive samples were included in the study. Among these positive samples *Aspergillus* spp. was observed in 41 cases.

Aspergillus flavus was found in 16 samples while *Aspergillus fumigates* in 5 samples and in 20 samples the species was not identified. In 18 samples the fungal element was isolated but the genus could not be determined.

Conclusion: *Aspergillus* spp. is very common pathogen in the fungal nasal polyposis and *Aspergillus flavus* was the common pathogen observed in our study.

Keywords: Fungal Infections, nasal polyposis, *Aspergillus*, KOH mount fungal culture.

INTRODUCTION

Fungal infection of the nose and paranasal sinuses first reported fungal sinusitis in 1791 by Plaignaud. Since then, few cases of fungal sinusitis have been reported compared with mycotic diseases at other sites¹ but now it has been increasingly recognized².

Aspergillus infection of the nose and paranasal sinuses has been recognized for nearly 100 years (1891) but a variant allergic aspergillus sinusitis has recently been identified and known for about last 30 years^{3,4}. It was first described as a form of noninvasive fungal sinusitis by Katzenstein et al. in 1983^{5,6}.

Grossly the sinus are found to be filled with firm white-tan mucoid material⁷. At surgery all were observed to have multiple sinuses, densely packed with grayish black inspissated mucin⁸. Histologically the mucinous material contains eosinophil, charcot-leyden crystals and fungal hyphae⁹.

Aspergillus which is a genus of spore-forming ubiquitous fungi, affects both the upper and the lower respiratory tracts^{10,11}. It is the most common fungal infection of the paranasal sinuses and usually appears as a chronic disease in an otherwise healthy person.¹² The dominant fungal pathogen appear to

vary in different geographic regions and related to individual host conditions. Immunoglobulin E-mediated allergic reactions to mold appear to be associated with disease in some patients, but not in all¹³. In some patients Immunoglobulin E-mediated allergic reactions to mold observed to be associated with disease¹³.

MATERIALS AND METHODS

Specimens were taken from ENT department of Abbasi Shaheed Hospital and Karachi Medical & Dental College and processed in Microbiology laboratory for fungal involvement. Among these specimens 59 culture positive cases were included in the study. Specimens were processed for the diagnosis by KOH mount for microscopic evaluation and mycological culture to determine the fungal involvement and type of fungus respectively. Fungal culture was done using Seaboard's dextrose agar at 25°C and at 37°C to observe dimorphism. It was observed periodically for the growth for 4 weeks. If the growth was present then the pathogen was identified by cultural characteristics and microscopic features of the isolates were observed by using Lactophenol blue stain.

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RESULT

Fifty nine culture positive samples were included in the study. Among these positive samples *Aspergillus* spp. was observed in 41 cases. *Aspergillus flavus* was found in 16 samples while *Aspergillus fumigates* in 5 samples and in 20 samples the species was not identified.

In 18 samples the fungal element was isolated but the genus could not be determined.

Table I: Fungal culture (n= 59)

Fungal Culture	n	%age
<i>Aspergillus</i> spp.	41	69.5
Fungal element (genus not identified)	18	30.5
Total Fungal culture positive samples	59	100

Table II: *Aspergillus* (n=41)

<i>Aspergillus</i>	n	%age
<i>Aspergillus</i> species (species not identified)	20	48.78
<i>Aspergillus flavus</i>	16	39.02
<i>Aspergillus fumigates</i>	05	12.20
Total	41	100

Table III: Sex distribution

Sex	n	%age
Male	29	49.15
Female	30	50.85
Total	59	100

Table IV: Age group distribution:

Age (in years)	n	%age
□18	01	01.69
18-20	03	05.08
21-30	28	47.46
31-40	13	22.04
41-50	12	20.35
51-60	01	01.69
61-70	01	01.69
Total	59	100

DISCUSSION

The study was carried out on two hundred twenty one patients in all patients who have a clinical diagnosis of nasal polyposis with or without fungal infection on the basis of anterior and posterior rhinoscopy. Fungal element was observed in 90 samples. Among these fungal element positive samples, 31 samples were positive only on microscopy. 59 samples were culture positive and these culture positive samples were included in the study.

Among these 59 patients, only one patient (1.69%) was having age less than 18 years, one (1.69%) between 51-60 years and 1(1.69%) was between 61-70 years; 13(22.04%) were between 31-40 years.

Most of the patients, 28(47.46%) who were culture positive belong to age group between 21-30 years; Age range was 10-62 years.

Among these 59 culture positive samples 30 were female and 29 patients were male reflecting almost equal gender involvement and there was no sex preponderance in fungal nasal polyposis in our study as reflected by Table: III.

In our study 29 were male while 30 were female patients. Our study (29:30) was in accordance with a local study by Taimoor Latif Maik, Mansoor basir pal, where there was an equal male and female (25:25) involvement in fungal nasal polyposis¹⁴ while study conducted by P. Karthikeyan and V. Nirmal Coumare¹⁵ reflects a marginal male preponderance (35:32). In another local study conducted by Siddqui et al¹⁶ in 2014 found a female preponderance and observed the fungal involvement in 45.13% male and 54.86% female patients while Kordbacheh P et al¹⁷ observed male preponderance where 65% were male and 35% were female patients in study conducted in Iran in 2006.

Fifty nine samples were culture positive and these culture positive samples were included in the study. Among these positive samples *Aspergillus* spp. was observed in 41 cases. *Aspergillus flavus* was found in 16 samples while *Aspergillus fumigates* in 5 samples and in 20 samples the species was not identified. In 18 samples the fungal element was isolated but the genus could not be determined.

In our study, *Aspergillus* species was isolated in forty one cases in a total of 59 culture positive samples, which is in accordance with the study of Kordbacheh¹⁷ and Razmpa¹⁸. In a local study conducted by Tariq Rafi et al¹⁹ in 1996 observed *Aspergillus* species as the most common pathogen in nasal polyposis which is also in accordance with our study where *Aspergillus* was the most common pathogen isolated. Another local study conducted by Farrukh MJ et al²⁰ also found *Aspergillus* as the commonest organism which is again in accordance with our study.

In our study *Aspergillus flavus* was observed in 16 cases in a total of 41 *Aspergillus* positive cases where which is consistent with the study of Kordbacheh¹⁷ and Razmpa¹⁸

Panda et al²¹ conducted the study in India and found *Aspergillus flavus* in 79.7% while Chhabara et al²² also conducted the study in India and isolated *Aspergillus flavus* in 9 out of 11 patients which is in accordance with our study.

Kameswaran et al²³ conducted the study in Saudi Arabia, Abha and identified *Aspergillus flavus* as the causative agent in the study which is consistent with our study while Daghistani et al²⁴ conducted the study in Saudi Arabia, but in a different

city Jeddah and found *Aspergillus fumigatus* as the pathogen in the study which is not in accordance with our study.

CONCLUSION:

Aspergillus spp. is very common pathogen in the fungal nasal polyposis and *Aspergillus flavus* was the common pathogen observed in our study.

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