

## MICROBIOLOGICAL ASPECT OF FUNGAL RHINOSINUSITIS: STUDY CONDUCTED IN TERTIARY CARE HOSPITAL OF NORTH INDIA.

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### Abstract

**Introduction:** Fungal rhinosinusitis is the emerging disease of current era, so isolation of fungus is important aspect to plan the treatment modalities accordingly.

**Methods:** 50 samples of suspected patients of fungal rhinosinusitis were studied. Various samples like nasal secretion, nasal lavage and tissue were examined on direct microscopy using KOH and processed by standard protocols for fungal culture.

**Result:** Out of 50 suspected cases fungal rhinosinusitis was seen in 23 (46%) cases. The 40% of cases were positive by direct microscopy using 20%KOH and 46% were positive by fungal culture. The most common fungal isolates was *Aspergillus flavus* (65.5%) followed by *Aspergillus niger* (13%).

**Conclusion:** *Aspergillus* spp. was the most common isolated species among all the cases of fungal rhinosinusitis.

**Keywords:** *Aspergillus* spp., Fungal, Rhinosinusitis.

### Introduction

Earlier fungal infections of paranasal sinuses were considered common in immunocompromised individuals, but there incidence has been increased in immunocompetent individuals in recent years, in North India. [1] Sinusitis or more accurately rhinosinusitis affects the 20% of the population, hence making it a common disorder.[2] It occurs in both acute and chronic forms. Among the two, chronic rhinosinusitis accounts for more than 90% of all cases. Chronic rhinosinusitis has a slow protracted course, and has different etiologies, fungal infections out of these are major cause.[3]

Diagnosis of fungal rhinosinusitis is based on clinical suspicion. Clinical presentation can provide a clue but diagnosis depend upon the microscopic examination and fungal culture from the tissues or nasal secretions obtained from the paranasal sinuses. Therefore, for establishing the etiological agent, direct microscopy and culture is important [1]

The aim of this study was to know the prevalence of fungal rhinosinusitis and its etiological agents to know the burden of disease in our area and help further planning its treatment modalities.

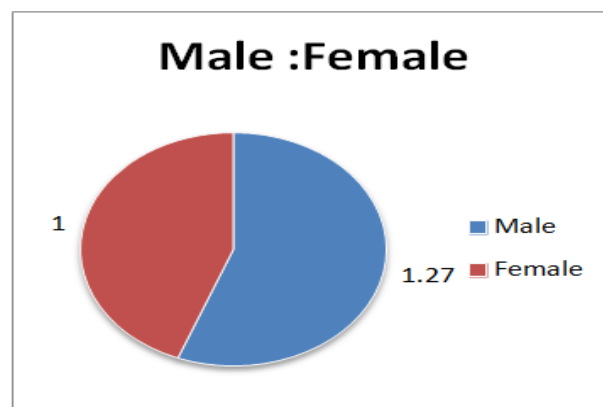
### Material and Methods

This prospective study was conducted in the department of Microbiology from the period of June 2017 to August 2018. A total of 50 clinical samples like nasal lavages, nasal secretions and tissues were received in the Mycology laboratory of department of Microbiology

from the ENT ward. The samples were collected from the sinuses by functional endoscopic sinus surgery (FESS) and sent to Mycology laboratory in sterile container containing the normal saline.

The tissue specimens received in the mycology laboratory were minced into small pieces (0.5-1 mm in diameter) using sterile scalpel, pestle and mortar. The specimens were examined direct microscopy and culture using standard techniques. Direct microscopy was done by using 20% KOH and mount was examined. Culture was done on Sabouraud's dextrose agar with Chloramphenicol and incubated at 25°C and 37°C, respectively. Further identification of fungal isolates was done by standard procedures.[4]

### Results



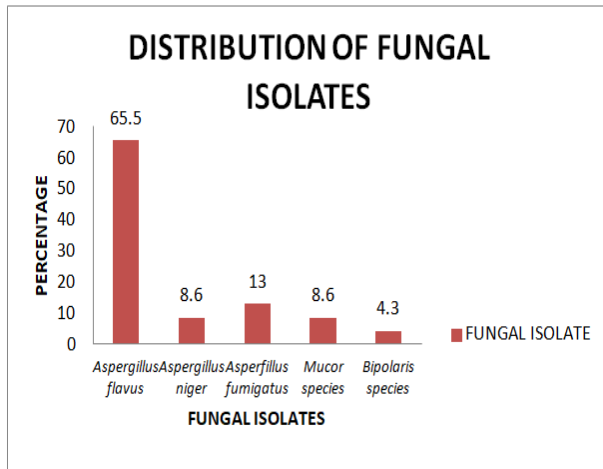
**Figure 1:** Male to female ratio

The male female ratio in our study was 1.27:1.

**Table 1:** Results of suspected fungal rhinosinusitis by different methods

Total cases n=50	Direct microscopy	Culture
Positive	19 (38%)	23 (46%)
Negative	31 (62%)	27 (54%)

Out of total 50 cases 19 cases were positive in direct microscopy and 31 were negative in direct microscopy. 23 cases were culture positive and 27 cases were culture negative.

**Figure 2:** Distribution of fungal isolates

Out of 50 suspected cases of fungal rhinosinusitis, 23 cases were positive for fungal rhinosinusitis. Out of these 23 cases, 20 were positive for fungal hyphae on direct microscopy whereas all were positive on fungal culture.

Male: Female ratio was 1.27:1 and maximum case were found in the age group of 31-40 (40.6%), followed by 41-50 (30.2%) and 21-30 (21.8%).

*Aspergillus* spp. (86.9%) Was the most common isolated species among all the cases of fungal rhinosinusitis. Among *Aspergillus* species, *Aspergillus flavus*(65.5%) was the most common fungal isolate followed by *Aspergillus niger* (13%) and *Aspergillus fumigatus* (8.6%).

### Discussion

Traditionally Fungal rhinosinusitis was considered as a rare disorder, but now it is recognized and is being reported worldwide with increase in incidence. In the present study the incidence of fungal rhinosinusitis was 46% , the similar incidence (48.7%) had been reported by Ajay Kumar Singh *et al.*[5] The other similar studies from the North and South Indian regions of the country has reported the incidence of fungal rhinosinusitis ranging from 21% to 46.7%. [1,3,6].

In our study the age of patient with fungal rhinosinusitis ranged from 21-70 years with mean age of 38 years. The

predominance was seen in males with a male to female ratio 1.27:1, as compared to study conducted by Michael *et al* where the predominance was seen in female patients with male to female ratio 0.8:1 with a mean age of 45.7 years ranging from 11 to 79 years.[7]Our finding were similar with the studies done by Prateek S *et al*, Ajay Kumar Singh *et al* and Kaur R *et al.*[1,5,6]

The predominant agent in western countries were found to be pigment producing dematiaceous fungi-*Bipolaris* species, *Curvularia lunata* and *Alternaria* species.[8] In the present study *Aspergillus flavus* (65.5%) was most common followed by *Aspergillus niger* (13%), results were similar with the study done by Kaur R *et al.*[6] Study done by Prateek S *et al* and Saravanan *et al* the most common fungal isolate was found to *Aspergillus flavus*( 57.1%, 81%) followed by *Aspergillus fumigatus* (14.2%, 9%). [1,9]

### Conclusion

*Aspergillus* spp. was the most common isolated species among all the cases of fungal rhinosinusitis.

### Limitations

In the present study, the sample size was small, which was not sufficient for significant results. Moreover, we were unable to collect the data from Pathology department, which would help in categorization of fungal rhinosinusitis into invasive and noninvasive type.

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