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How Common is Allergic Fungal Rhinosinusitis in Chronic Rhinosinusitis Patient - A Retrospective Institutional Study

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Abstract: ***Objectives: The objective of the study is to determine the proportion of Fungal Rhinosinusitis amongst the chronic Rhisosinusitis patients. Method: An Observational cross sectional retrospective study was conducted between December 2022 to May 2024 in a Tertiary care centre amongst 80 subjects. All the subjects underwent relevant haematological and radiological investigations including Diagnostic Nasal endoscopy. The results were based on Diagnostic Nasal examination, Nasal swab, KOH mounted microscopy and Fungal culture. Result: Out of 80 study populations, 16 % were confirmed for Allergic Fungal Rhinosinusitis. Male gender, age > 40 years, patients from rural areas and those belonging to low socioeconomic status and occupations which had frequent exposure to dust and unhygienic environment were predisposed to allergic fungal rhinosinusitis. Associated nasal polyps, nasal discharge and nasal blockage and reduction of smell were commonly seen. The fungal culture isolated the Aspergillus species most commonly in 16 %. Conclusion: It is concluded that Allergic Fungal Rhinosinusitis is fairly common conditions which was earlier included in the broad group of Chronic Rhinosinusitis. Therefore, categorisation of such cases are very much important for appropriate management.***

Keywords: Allergic Fungal Rhinosinusitis (AFRS), Chronic Rhinosinusitis (CRS), Diagnostic Nasal Endoscopy (DNE), Allergic Mucin (AM)

1. Introduction

Chronic Rhinosinusitis refers to a chronic persistent infection of Nose and Paranasal sinus mucosa for greater than 12 weeks. A good number of cases of allergic fungal Rhinosinusitis are being diagnosed nowadays which were earlier included in the broad category of Rhinitis [1, 3]. The prevalence of Allergic Fungal Rhinosinusitis in India as per study by Chakraborty et al is 20 % [2]. The most common species of fungus causing AFRS include Aspergillus, Candida, Curvularia, Alternia, Mucormycosis [10, 11]. Most of the patients present themselves with Nasal Obstruction, nasal discharge, post nasal drip, Hyposmia and/or Anosmia and Facial pain. Such type of patient are frequently being associated with nasal polyp [10, 13]. Cases are being diagnosed based on their history, clinical examinations and Diagnostic nasal examinations for Allergic mucin and radiological examinations such as CT scan for Nose and PNS, KOH mount for Fungal Hyphae and Culture for identification of species [4, 6, 12]. They are usually managed initially with conservative treatment with oral systemic or nasal steroid, however the definitive treatment is Surgery [4, 10, 12]. The main objective of the present study is to determine the proportion of the case of AFRS as there is no local data available on the subject.

2. Methods

This is a retrospective study performed in Department of Otorhinolaryngolgy at Agartala Government medical College covering a period of 1 year and 06 months between December 2022 to May 2024. This study has been approved by Institutional Ethical Committee for clinical studies.

The inclusion criteria include all patients attending in OPD and IPD suggestive of chronic Rhinosinusitis i, e with symptoms of nasal obstruction, nasal discharge, hyposmia/anosmia of greater than 12 weeks duration [83] and those who give their consent. Non consenting patient, age < 10 years, invasive form of Rhinosinusitis and diagnosed case of malignancy of Nose and PNS were excluded from the study. Total study population is 80.

All the patients underwent relevant clinical examination and Diagnostic nasal Endoscopy. Nasal swab was taken from the middle meatus and sent for KOH mount microscopy. Relevant hematological investigations were done and selected patients were also subjected for CT scan of Nose and PNS. Whenever indicated, cases underwent by Endoscopic sinus surgery and samples were sent for fungal study.

The diagnosis of Allergic Fungal Rhinosinusitis was based on the following criteria

1) KOH mounted Microscopic examination – for presence of fungal hyphae and element
2) Diagnostic nasal Examination – for allergic mucin
3) Fungal Culture –For identification of fungal species.
4) CT scan (nose and PNS) – for the presence of opacities of PNS with hyperattenuated shadow with or without erosion of walls of PNS.

Analysis of data was done using SPSS 22.0 statistical software and R environment ver.3.2.2. 'p' value of less than 0.05 were considered statistically significant among the variables.

3. Results

The total number of study populations was 80 and the age of study subjects ranges from 13 to 76 years. Age group between 40 to 70 years were mostly affected (38.8%), 41 (51.3 % were males and 39 (48.8%) were females, 46.2 % of patients with allergic fungal Rhinosinusitis were from Rural areas, 76.9 % of those with allergic fungal Rhinosinusitis were from low socio economic classes.53.8 % of those with allergic fungal rhinosinusitis were farmers and manual labourers.

Table 1: Age distribution of Study Population

Age in Years	No. of Patients	%
<20	13	16.3
20 - 30	14	17.5
31 - 40	22	27.5
>40	31	38.8
Total	80	100.0

Regarding the signs and symptoms in patients with AFRS – 61.53 % have associated polyps, Hyposmia/anosmia was present in 53.8 %, Nasal discharge/nasal blockade was seen in 75 %, Atopy/allergy was present in 63.8 %, Hypereosinophillia was seen in 70 %, allergic mucin was a very constant feature, Aspergillus species was seen most commonly as the infecting fungal species (11/13) i, e 84 % and candida species (2/13) i, e 15 %. Co morbities associated were Type 2 Diabetes mellitus and Hypertension.

Table 2: DNE Findings of study populations

Findings	Study populations (n=80)	Percentage (%)
Allergic Mucin	17	21.25
Nasal Polyps	30	37.5
Inferior Turbinate Hypertrophy	15	18.75
Deviated nasal septum	10	17.5
Normal findings	8	10

Table 3: Pie chart representation of proportion of AFRS patients

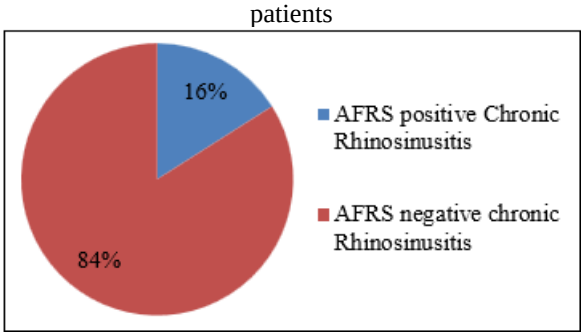
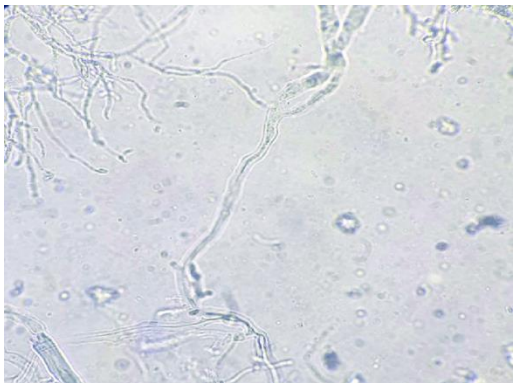


Table 4: Signs and symptoms among study populations

Symptoms	No. of Patients (n=80)	%
Nasal Obstruction	80	100
Nasal discharge	80	100
Nasal Polyp	17	21
Hyposmia/Anosmia	26	32
Epistaxis	10	12
Headache	30	37

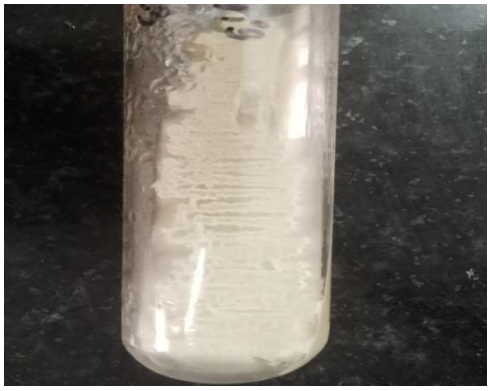
Table 5: Correlation of allergic mucin with fungal culture

Allergic Mucin	Fungal Culture		'p' value
	Positive	Negative	
Positive	10 (76%)	3 (23%)	0.03
Negative	3 (23%)	3 (23%)	



Pic. No 1: Branching septate Hyphae seen on KOH Mount Microscope

Pic. No 2: Aspergillus species cultured on AFRS positive study subjects



Pic. No 3: Candida species cultured on AFRS positive Study subjects

4. Discussion

With the increasing prevalence of disease such as Diabetes Mellitus, HTN, Immunocompromised states, the cases of AFRS are gradually increasing. In the present study, 16 % of patients of Rhinosinusitis are positive for Fungal study whereas Chakraborty et al reported it to be 20 % [2]. Similarly, a study in central India by Prafulla Songara et al reported it to be 22.9 % [7]. The age groups of 40 to 60 years, unhygienic living conditions, occupations involving daily exposure to dust and garbage were found predisposed to AFRS which was also reported in a study by shetty S et al [14]. These observations are more or less similar with the findings of previous study.

5. Conclusions

In the present study, out of 80 subjects of Rhinosinusitis, 16 % were positive for the fungal study. It was also observed that nasal polyps and Hyposmia were very commonly associated with AFRS, accounting for 53% and 69% respectively. There is no proper study or data about the prevalence of the condition in this part of the country where cases of Allergic Rhinitis are quite high.

Abbreviations:
AFRS – allergic fungal Rhinosinusitis
KOH – Potasium Hydroxide
HTN – Hypertension
NS - Normal saline
SES - socio economic status
ND - Nasal discharge
NB - Nasal Blockage
AM - Allergic Mucin
DNS - Deviated nasal Septum

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Conflict of interest: The authors declare no conflict of interest.

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