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Original Article

Clinicopathological profile of fungal rhinosinusitis

Fazal-I-Wahid, Adil Khan, Iftikhar Ahmad Khan

Abstract:

Objective: To determine the clinicopathological features of fungal rhinosinusits at a tertiary care hospital.

Material and Methods: This study was conducted at the Department of ENT, Head and Neck surgery, PGMI/ LRH Peshawar. This was a four years prospective study from January 2007 to December 2011. All fifty five patients were evaluated thoroughly in terms of history, examination and investigation. Biopsy of nasal mass was performed and biopsy specimens were studied by same histopathologist. After diagnosing the patient as a case of fungal rhinosinusitis surgical procedure was performed according the extent of disease. The data was analyzed using SPSS version 17.

Results: These patients were in age range from 11- 66 years with mean age of 37.74 + S.D 16.46 years. They constitute 34 male and 21 female with male: female ratio was 1.6:1. Majority of patients (41.8%) belonged to middle age group. Most of the patients (60%) had lower socioeconomic status and mainly they were from rural area (74.54%) with only 30.9% literacy level. The commonest symptoms of these patients were nasal stuffiness (85.45%). Non-invasive fungal rhinosinusits was on top (87.27%). Aspergillus sp was the common fungal isolates (12.72%).

Conclusion: Fungal rhinosinusitis is commonly affecting middle age group people. Allergic fungal rhinosinusitis is the most common entity of fungal rhinosinusitis and Aspergillus is the commonest pathogen.

Key words: *Rhinosinusitis, Fungal sinusitis, Allergic sinusitis, Invasive and Noninvasive fungal sinusitis.*

Introduction:

Fungal rhinosinusitis (FRS) has been a known medical entity for several hundred years but only in more recent times the entity has been further defined.[1] Fungal infections have emerged as a world-wide health care problem in recent years.[2] Fungal rhinosinusitis may be categorized as acute, sub-acute and chronic conditions based on severity and duration of the disease specific symptom.[3] On the basis of clinicopathologic evidence of tissue invasion, fungal rhinosinusitis has two major classifications: noninvasive and invasive fungal rhinosinusitis.[4] There are three forms of noninvasive fungal rhinosinusitis: superficial sinonasal mycosis, allergic fungal rhinosinusitis (AFRS) (a complex entity characterized by the presence of allergic mucin with histologic similarities to those reported in Allergic Bronchopulmonary

Department of ENT - Head and Neck surgery, Postgraduate Medical Institute (PGMI) / Lady Reading Hospital (LRH), Peshawar, Pakistan.

Address of Correspondence: Dr. Fazal-I-Wahid, Junior Registrar, ENT - Head & Neck Surgery, PGMI / LRH, Peshawar, Pakistan. Contact: 091-9211430. (ext. 3065), Mobile: 0343-9083224, E-Mail: drfazal58@yahoo.com

Aspergillosis) and fungal ball. Invasive disease is characterized as either acute or chronic based on the length the time symptoms are present before presentation.[4, 5] Patients with acute invasive disease are usually immunosuppressed and, by definition, present with symptoms of less than one-month duration. This entity is characterized by the presence of fungal forms invading into the sinonasal submucosal with frequent angioinvasion and rapid intervention is necessary.[4,6] Patient symptoms with fungal rhinosinusitis include nasal stuffiness, nasal discharge, facial pain, fever, and headache.[7] Diagnostic criteria for fungal rhinosinusitis, after specific symptoms of the disease confirmed by primary examinations are nasal endoscopy, X-ray radiography, CT and MRI.[8] Definitive diagnosis of fungal rhinosinusitis can be achieved by direct microscopically observation of dispersed samples in KOH, histo-pathological studies of dissected polyps or mucosal tissues by Hematoxylin and Eosin, Gomori's methylamine silver and periodic acid Schiff stains.[9] The treatment modality for fungal rhinosinusitis includes non surgical and surgical procedures.[10]

The purpose of the present study was to determine the clinicopathologic findings of fungal rhinosinusitis and treatment outcome at a tertiary care hospital.

Methods:

This study was conducted at the Department of ENT, Head and Neck surgery, Post Graduate Medical Institute, Lady Reading Hospital Peshawar. This was a prospective descriptive study. The duration of the study was four years from January 2007 to December 2011. Fifty five patients were enrolled in this study. The patients of any age and either gender presented to ENT Department and diagnosed as cases of fungal rhinosinusits were included in the study. The patients who were not willing for registering in study and those who were lost from follow up were excluded from the study. A detailed history was taken; thorough examination of ENT and other systems was carried out. Besides baseline investigations CT scan and MRI were performed to know the exact sites and extent of disease. Biopsy of nasal mass was performed and biopsy specimens were studied by same histopathologist. A well informed consent was taken. The study was approved by the ethical committee of the institute. After diagnosing the patient as a case of fungal rhinosinusits surgical procedure was performed. These patients were put on antifungal treatment and they were followed for six months. The data was collected on preformed proforma and was analyzed using SPSS version 17.

Results:

In this study a total of fifty five patients were enrolled. These patients were in age range from 11- 66 years with mean age of 37.74 + S.D 16.46 years. These patients constitute 34 male and 21 female with male: female ratio was 1.6:1. Majority of male patients (41.8%) belonged to the group of patients in the age range 21-40 years with mean age 31.3+ S.D 5.7 years (Table-I). In this study most of the patients (60%) had lower socioeconomic status and mainly they were from rural area (74.54%) with only 30.9% literacy level (Table-II). The commonest symptoms of these patients were nasal stuffiness (85.45%), nasal discharge (72.72%) followed by facial discomfort 70.90% (Table-II). Among the diagnosis non-invasive fungal rhinosinusits was the common (87.27%) finding and allergic fungal rhinosinusits was the commonest observation (61.81%) while Aspergillus sp was the usual fungal isolates (Table-IV).

Table-I

Patients distribution in age groups with mean and standard deviation (n=55).

Age Range (Years)		No. & % age	Mean age (Years)	St Dev
<20	Male	05(9.1)	15.8	3.1
	Female	03(5.4)	14.6	3.2
21-40	Male	23(41.8)	31.3	5.7
	Female	13(23.6)	28.0	5.8
>40	Male	06(10.9)	54.8	9.3
	Female	05(9.1)	52.2	8.1

Table-II

Socio-demographic features of the patients (n=55).

Features	Frequency	Percentage
Male	34	61.81%
Female	21	38.18%
Lower Socioeconomic Class	33	60%
Middle Socioeconomic Class	13	23.63%
Upper Socioeconomic Class	09	16.36%
Rural	41	74.54%
Urban	14	25.45%
Illiterate	38	69.1%
Educated	17	30.9%
Symptoms duration< 1months	36	65.45%
Symptoms duration1-3months	12	21.81%
Symptoms duration> 3 months	7	12.72%
No risk factors	42	76.36%
Associated diabetes mellitus	11	20%
Associated hematologic malignancy	2	3.63%

Table-III

Clinical features of patients in this study (n=55).

Clinical Features	Frequency	Percentage
Nasal Stuffiness	47	85.45%
Nasal Discharge	40	72.72%
Facial Discomfort	39	70.90%
Nasal Mass	26	47.27%
Sneezing	22	40%
Facial Swelling	18	32.72%
Cough	15	27.27%
Headache	13	23.63%
Fever	10	18.18%
Peri-orbital Swelling	7	12.72%
Blurred Vision	6	10.90%
Proptosis	4	07.27%

Table-IV

Pathologic types and fungal pathogens isolated in this study (n=55).

Classification	Diagnosis	Frequency	Percentage	Most common Isolates
Non-invasive	Allergic fungal rhinosinusits (AFR)	34	61.81%	Dematiaceous fungi
	Fungal ball (FB)	9	16.36%	Aspergillus sp.
	Combined AFR+FB	5	9.09%	Aspergillus sp.
Total		48	87.27%	
Invasive	Acute invasive	2	3.63%	Aspergillus sp.
	Chronic invasive	3	5.45%	Candida albicans
	Chronic granulomatous		2	3.63% Aspergillus flavus
Total	6		10.90%	

Fig.-1: *Picture showing lateral rhinotomy incision on right side.*

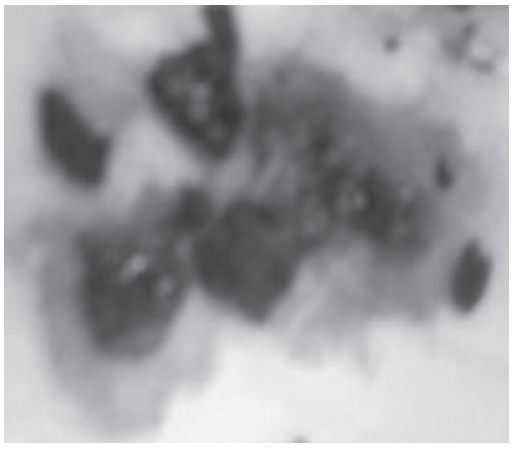

Fig.-2: *Picture showing mud of fungal rhinosinusitis removed via lateral rhinotomy.*

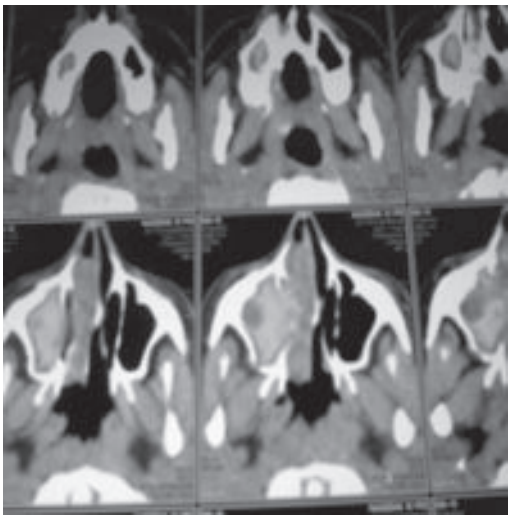

Fig.-3: *CT scan of nose, nasopharynx, paranasal sinuses and skull base axial and coronal views showing heterogeneous mass involving right nasal cavity, right maxillary and ethmoid sinuses with double density sign characteristic of fungal infection.*

Discussion:

The diversity of fungal rhinosinusits (FRS) is highlighted by its many clinical and histopathological presentations. Clinically, FRS can be acute and chronic.[7] The pathologic spectrum encompasses a variety of different entities which are classified as either invasive or non-invasive and then into specific pathologic categories which are

descriptive of clinical and histological disease processes.[9] Fungal rhinosinusits can involve any age, however in our study the commonly suffered people belonged to age group 21-40 years, with mean age of 37.74 years which is consisted with study of Azar[11] having mean age of 41.9 years while it is at variance from study of Soontrapa[12] where mean age was 54.8 years. Both genders can be involved by fungal infection. In this study males were predominantly affected (61.81%) which simulates to study of Kamal[13] with male predominance (53.33%) and differs from results of Michael[14] where female outnumbered (54.50%). Forty one cases (74.54%) were from rural areas with lower socioeconomic status (60%). Most of the patients (69.1%) were illiterate and majority of them (65.45%) having symptoms lasting for less than one month duration. Similarly Kamal and collegues[13] conducted a study on sixty patients and found that 46 (76.67%) patients were from rural area whereas 14 (23.33%) were from urban area. He also observed 50% were farmers with high poverty level of 80%. The commonest clinical features in this study were nasal obstruction (85.45%), nasal discharge (72.72%) and nasal mass (47.27%) which were comparable to the features reported by Khan[15] having nasal discharge (100%), nasal obstruction (92.3%) and headache (61.5%), while these were not an agreement to the results of Soontrapa[12] where commonest features were fever (51.2%), facial pain (32.6%) and headache (25.6%). In Shrestha[16] study clinical features were headache and facial pain (82%), nasal blockage (90%), nasal congestion (50%), nasal discharge (56%). The reason may be different patient intelligence level and inherent characteristics of fungal pathogens. Based on histopathological study noninvasive fungal rhinosinusitis were found in 48 patients (87.27%) and invasive fungal rhinosinusitis were recorded in 6 patients (10.90%). Chen and colleagues[17] found noninvasive and invasive fungal rhinosinusitis in 58.18% and 41.81% patients respectively.

Among noninvasive rhinosinusitis allergic fungal rhinosinusitis was the commonest finding (61.81%) followed by fungal ball (16.36%). Similarly Das[18] also observed non-invasive fungal rhinosinusitis 87.25% while invasive fungal rhinosinusitis 12.5% and allergic fungal rhinosinusitis was the commonest (45.0%) infection among noninvasive rhinosinusitis. As allergic fungal rhinosinusitis is the commonest form of fungal of rhinosinusitis which is also supported by the findings of Michael[14] who reported that among the 211 patients, 133 (63%) had the allergic form of the disease, with 51 (24%) presented with acute invasive disease and 21 (10%) presented with chronic invasive sinusitis. Fungal rhinosinusitis may be caused by different fungi depending upon the demographic and host distribution. However in our study dematiaceous fungi were the commonest (61.81%) fungal isolates recovered from allergic fungal rhinosinusitis followed by Aspergillus sp (32.71%). However in Das[18] Study Aspergillus sp. was the commonest (65.8%) pathogens followed by dematiaceous sp. (9%).In Challa[19] report also Aspergillus sp. was the commonest etiologic agent. In Soontrapa[12] study the predominant pathogens were Aspergillus sp (63.1%) and Candida was 7.2%. Likewise Saravanan[20] disclosed that the most common culture isolate was Aspergillus flavus (n=26; 81%), followed by Aspergillus fumigatus (n=3; 9%). A Bipolaris species was isolated in only 2 patients (6%).

Conclusion:

It is concluded from this study that fungal rhinosinusitis is commonly affecting middle age group people. Allergic fungal rhinosinusitis is the commonest entity of fungal

rhinosinusitis and Aspergillus is the commonest pathogen responsible for fungal rhinosinusitis. Moreover the diagnosis of fungal rhinosinusitis can be made on clinical features complemented with radiological investigations.

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