Original Research Article

Study of rhinosporidiosis in tertiary care centre

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Abstract

Objective : The case study is presented to see the incidence and prevalence of rhinosporidiosis among nasal masses in Jhansi district and health awareness among common people.**Methods:** A prospective and restrospective study was done at Department of Pathology, Medical College, Jhansi (U.P.) during the year 2000-2006. The case study included 67 cases of nasal mass of these 67 cases, 08 cases were reported as rhinosporidiosis by Hand E stained section. Special stains like GMS and PAS were done. **Results:**Rhinosporidiosis accounted for 12% of all nasal masses in our institution. All cases were confirmed histopathologically. Patients presented with symptoms of nasal obstruction. Age of the patients included in this study ranged from 0 years to 80yrs. The disease presented commonly in 2nd decade 37% followed by 3rd and 1st decade with 25% and 12.5% each. There were 8 males and no females with M:F ratio of 8:0 having male preponderence.**Conclusion:** Rhinosporidiosis is a chronic granulomatous inflammation caused by Rhinosporidium seeberi which is endemic in India.Key to control is health awareness among common people for prevention, early diagnosis, treatment and efforts are needed for decreasing reccurence rate after surgery of this disease.

Keywords:Rhinosporidiosis, Nasal Mass, Special Stain & Dapsone.

Introduction

Rhinosporidiosis is a chronic granulomatous inflammation, Caused by Rhinosporidiosis seeberi causing polypidal lesions in the nasal cavity characterized by the characterized by the presence ofthickwalled sporangia measuring 50-350, microns in diameter and containing numerous spores associated with a heavy chronic inflammatory reaction. With occasional foci of suppuration and foreign body giant cells. It commonly affects the mucous membrane of nose, nasopharynx and eye, lips, palate, uvula, conjunctiva, skin, larynx, trachea, penis, vagina and bone [1,2].

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Majority of cases are reported in India and srilanka[4]. But infection have been reported to have occurred in America, Europe & Africa. Disease is transmitted through droplet infection, by close contact with animal and bathing and diving in contaminated water. The causative organism is Rhinosporidium seeberi, first described in 1900 by Guillermo seeberi [3]. Most cases presented as nasal obstruction and epistaxis due to the friable polypoid mass in the nasal cavity[5]. According to Kunnam Kutty (1963) disease is commonly seen in the age group of 20-40 years of age. Its manifestation is a polypoid mass growing inside the affected cavity and the nasal cavity and the only treatment is surgical excision. Here we are presenting the incidence of rhinosporidiosis in Jhansi district.

Materials and methods

A prospective study was done during the year 2000-2006 in the Department of Pathology, MLB Medical College, Jhansi (U.P.). The biopsy samples were

received from the Department of Surgery and ENT of the MLB medical college

Inclusion criteria: All cases presenting with nasal mass

Exclusion criteria: Patients with other comorbidities

Consent: Written consent was obtained from the relatives of patients after explaining them the nature and purpose of the study. They were assured that confidentiality would be strictly maintained. The option to withdraw from the study was always open.

Observation Chart

Methodology

A histopathological study of 67 cases with nasal masses were done of these 67 cases, 08 cases were diagnosed as rhinosporidiosis. The cases were diagnosed on H and E stained section special stains like GMS PAS were also done. Relevant clinical details and laboratory investigations were collected from the hospitals.

Table 1: Nasal Masses

Sr. No.	Nasal Masses	No .of Cases	Percentage
I.	**Inflammatory lesions**	**45**	**67.1%**
1.	Nasal Polyps		
	- Inflammatory	26	38.9%
	- Allergic	5	7.4%
2.	Chronic specific infective rhinitis		
	- Tuberculosis	4	5.9%
	- Rhinoscleroma	2	2.9%
	- Rhinosporidiosis	8	12.0%
II.	**Benign lesions / Tumour**	**15**	**22.5%**
1.	Hemangioma		
	- Capillary	9	13.7%
	- Cavernous	2	2.9%
2.	Angiofibroma	1	1.5%
3.	Papillomas		
	- Squamous	-	
	- Inverted	2	2.9%
4.	Neurilemmoma	1	1.5%
III.	**Malignant lesions/Tumor**	**7**	**10.4%**
1.	Inverted squamous cell papilloma with early malignant changes	1	1.5%
2.	Squamous cell carcinoma		
	- Grade I	1	1.5
	- Grade II	1	1.5
	- Grade III	2	2.9
3.	Undifferentiated carcinoma	1	1.5%
4.	Adeno-carcinoma	1	1.5%

Table 2: Sex distribution

Male	Female
8 [100%]	0[0%]

Table 3: Age wise distribution in decades

Decades	No. of Cases	Percentage
1st	1	12.5%
2nd	3	37.5%
3rd	2	25.05
4th	1	12.5%
5th	1	12.5%
6th	0	0
7th	0	0
8th	0	0

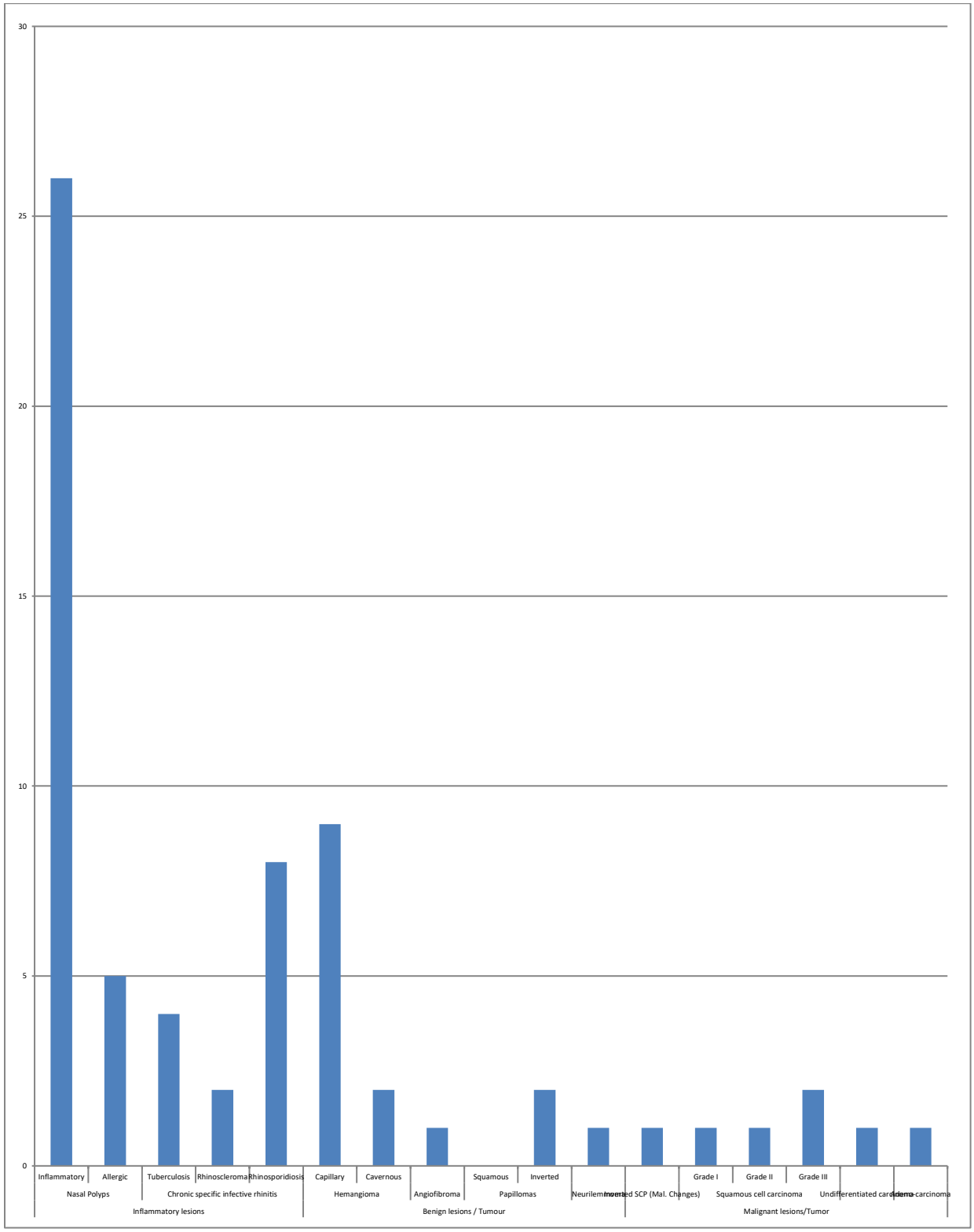


Fig 1: Nasal masses

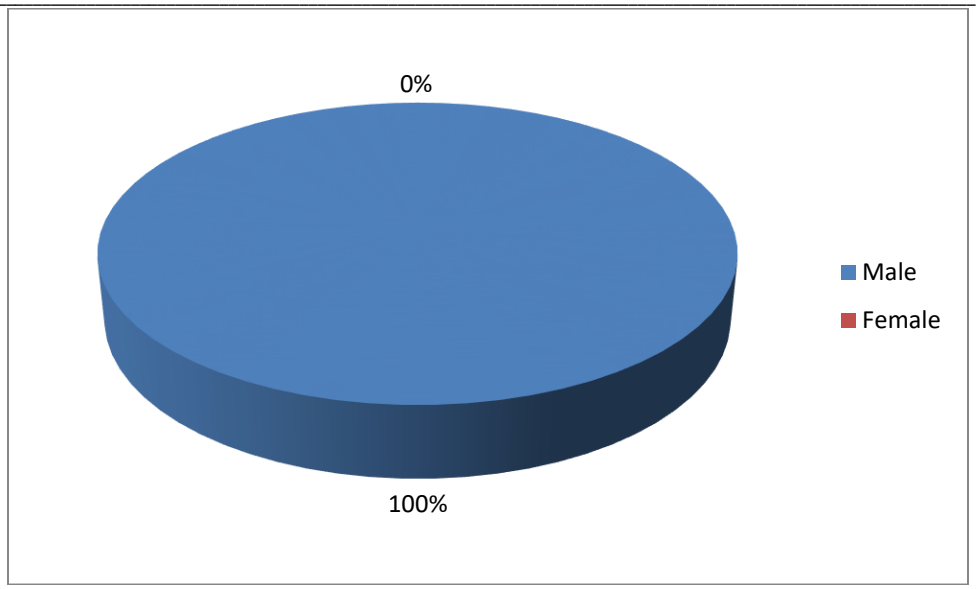


Fig 2: Sex distribution

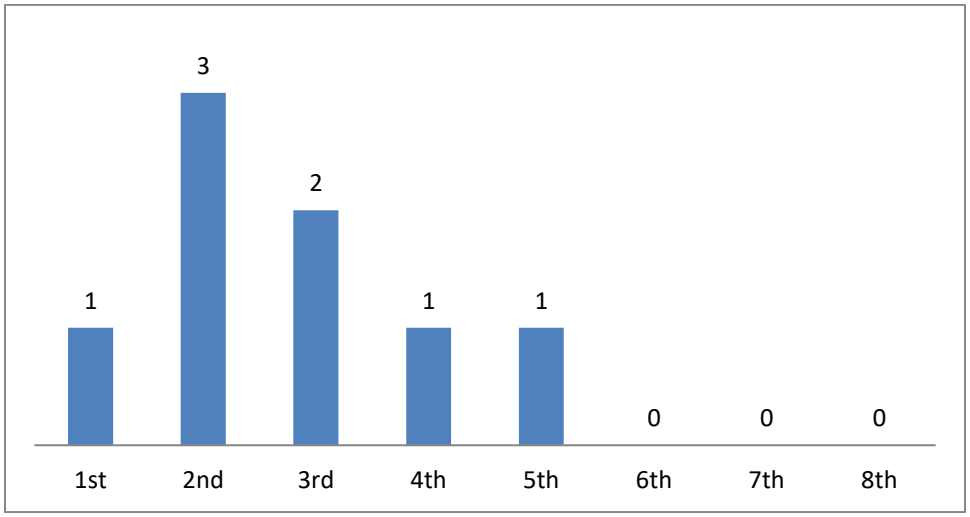
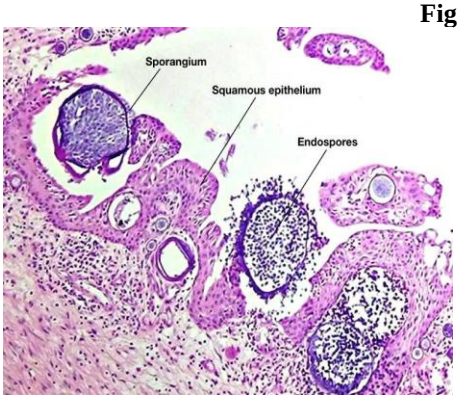


Fig 3: Age wise distribution of cases



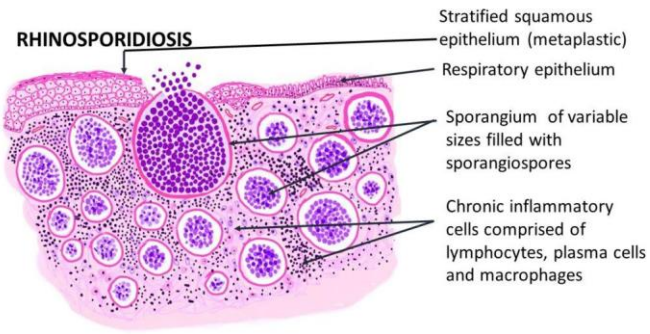


Fig 4:Histopathology

Results

During study, rhinosporidiosis accounted for 12% of all nasal masses in our institution. All cases were confirmed histopathologically. Patients presented with symptoms of nasal obstruction. Age of the patients included in this study ranged from 0 yrs to 80yrs. The disease presented commonly in 2nd decade 37% followed by 3rd and 1st decade with 25% and 12.5% each. There were 8 males and 0 females with M:F ratio of 8:0 having male preponderence.

Statistical analysis

Data was compiled using MS excel 2007 and analysis was done with the help of Epi-Info 7 software. Frequency and percentage were calculated & statistical test (Chi Square) was applied wherever applicable; $p<0.05$ was taken as statistically significant.

Discussion

Rhinosporidiosis seeberi is a member of the phycomycetes class of fungi. It was first described as a protozoan by Guellermo seeberi in Argentina1900. In India the highest incidence is seen in costal areas especially Tamilnadu and also West Bengal. in this study, among 67 nasal masses, 08 cases (12%) were rhinosporodiosis. In our study the common age group involved is between 11 to 20 yrs. Ahmed *et al* and Ranjan kumar guru *et al* reported cases between 21 to 30 years of age group.[1,2]Ahmed NA et al did an epidemiological study on rhinosporidiosis.It is a sporadic disease in different parts of our country which affects both man and animals. It chiefly affects the mucous membrane of nose and less frequently in other organs This study was done with the aim to assess the proportion of rhinosporidiosis cases among the total nasal masses operated in our hospital ,to identify the demographic distribution of the cases in Malappuram district ,to evaluate the age and sex preponderance of these cases and to compare this study with similar studies conducted in India as to stress on the endemic nature of this disease in our district. So far there is no known medical treatment though systemic therapy with dapsone over a prolonged period is found to delay the recurrence. The only definitive management is surgical excision with high recurrence rates which leads to financial burden and psychological stress to the patients. The study revealed the endemic nature of this disease in Malappuram district and the careful history revealed frequent pond baths by all the patients.This survey evaluates the epidemiological aspects and revealed the endemic nature of this disease in Malappuram district and points towards the need for health education regarding the preventive measures as the treatment options at hand are inadequate .[1]

Guru RK et al studied Rhinosporidiosis with special reference to extra nasal presentation.The purpose of this study is to determine the prevalence of rhinosporidiosis in various groups of people & to know the various possibilities of extra nasal presentation as well as manifestations, so that the disease can be diagnosed early & proper treatment can be given at an early date. Nose was the most common site of rhinosporidiosis. In the extranasal presentation nasopharynx is the MC site. Other sites are eye, skin & larynx. Common age group of involvement is 21-30 years. Males are affected more. The disease is prevalent among rural population. Nasal obstruction & epistaxis are the MC presenting symptom in nasal rhinosporidiosis. In nasopharyngeal cases foreign body sensation, stuffiness in ear & speech defect are the presenting symptoms. Ocular cases mostly presented with mass in conjunctiva or foreign body sensation in eye with bloody discharge. Atypical presentation of rhinosporidiosis in head and neck region is rare. Very often, this atypical presentation causes dilemma in diagnosis and creates confusion. Diagnosis of rhinosporidiosis should be kept in mind in all granulomatous lesions involving the mucous membranes in the endemic area. [2]

Table 4: Age wise distribution of cases

Authors	(0-10) yrs	(11-20) yrs	(21-30) yrs	(31-50) yrs	Above 50 yrs	Total
Ahmed et al	-	12	24	14	4	54
Ranjan Kumar Guru et al.	10	81	91	53	7	242
Our study	1	3	2	2	0	8

In this study, male preponderance is seen. Ahmed *et al* and Ranjan kumar guru *et al* also reported male preponderance. comparision between sex preponderance in various studies done in table 5.

Table 5 : Comparison between sex preponderance in various studies

Authors	Male	Female	Total
Ahmed et al	168	74	242
Ranjan Kumar Guru et al.	39	15	54
Our study	08	00	08

Kumar Mandal P et al studied disseminated cutaneous rhinosporidiosis which presents a tumor like lesion with therapeutic challenge. A 56 year old man presented with multiple tumor like lesions all over the body in our cancer institute in April 2012. Fine needle aspiration cytology (FNAC) from the skin lesions revealed many sporangia and spores of R. seeberi. He had history of nasal mass being removed by excision and was immunocompetent. Histopathological examination and periodic acid Schiff (PAS) stain confirmed it to be disseminated rhinosporidiosis. His accessible lesions were excised with cautery and he was put on oral dapsone therapy. He did not show recurrence till six months of therapy. A common lesion with an uncommon presentation should not be missed which can increase the morbidity and even mortality in such a case. [3] Ashworth JH et al studied Rhinosporidium seeberi with special reference to its spolulation and affinities. Herr RA et al on the other hand did phylogenetic analysis of Rhinosporidium seeberi's 18S small-subunit ribosomal DNA groups this pathogen among members of the protoctistan Mesomycetozoa clade. They amplified and sequenced nearly a full-length 18S small-subunit (SSU) ribosomal DNA (rDNA) sequence from R. Seeberi .This molecular affinity is remarkable since members of the genus Dermocystidium form spherical structures in infected hosts, produce endospores, have not been cultured, and possess mitochondria with flat cristae. With the addition of R. seeberi to this clade, the acronym DRIP is no longer appropriate. We propose to name this monophyletic clade Mesomycetozoa to reflect the group's phylogenetic association within the Eucarya.[4,5]

Rhinosporidium seeberi, a microorganism that can infect the mucosal surfaces of humans and animals, has been classified as a fungus on the basis of morphologic and histochemical characteristics. Using consensus polymerase chain reaction (PCR), we amplified a portion of the R. seeberi 18S rRNA gene directly from infected tissue. Analysis of the aligned sequence and inference of phylogenetic relationships showed that R. seeberi is a protist from a novel clade of parasites that infect fish and amphibians. Fluorescence in situ hybridization and R. seeberi- specific PCR showed that this unique 18S rRNA sequence is also present in other tissues infected with R. seeberi.Fredricks DN et al studied Rhinosporidium seeberi and concluded that it is a human pathogen from a novel group of aquatic protistan parasites. Their data support the R. seeberi phylogeny recently suggested by another group. R. seeberi is not a classic fungus, but rather the first known human pathogen from the DRIPs clade, a novel clade of aquatic protistan parasites (Ichthyosporea).[6]

Moses JS et al did an epidemiological survey of rhinosporidiosis in Kanyakumari district of Tamil Nadu. One hundred and twelve nasal polyps received along with full history from three different hospitals of Kanyakumari district were found positive for rhinosporidiosis on histopathological examination. The 11–20 years age group found to be highly susceptible (60 per cent). There was no sex prepondence in contracting the disease as the cases were evenly distributed between both sexes. These findings exhibited the endemic nature of the disease in Kanyakumari district.Unreported cases to an extent of 9 to 40 per cent were encountered during the ENT disease diagnostic camps conducted in nine high incidence villages. Further 8 more cases were detected in addition to cases attended in the hospitals and ENT camps when a complete enumeration of cases was undertaken in Pallam village. Thus the actual number of cases found in the district need a stratified random sampling.[7]Saha SN et al did a calcutta based hospital study, in which it was found that Rhinosporidiosis is one of the common tropical diseases in ENT practice. In the study, it constituted about 1% hospital admission for surgery per annum. Nasal and extranasal involvement particularly occular involvement was critically examined in this study. Complete excision of rhinosporidial mass under endoscopie guidance for nasal rhinosporidiosis is found to give superior result in term of recurrence. Kutty MK et al made some observations on rhinosporidiosis. In a survey of 31 cases (Rhinosporidium seeberi) during 1960-63 Muslims and Hindus were affected to the same extent, highest incidence occurred in the 20-40 age group, 22 cases involved the nose, and 9 the eye (6 conjunctiva primary; 3 lacrimal sac, all primary infections). Only 2 females were involved, and close relatives of the patients did not seem to contract the disease. Possible modes of transmission by inhalation or contact are discussed.[8,9]Karunaratne WA presented a detailed account of *Rhinosporidium seeberi* infections .Similar study was done by Chakraborty D et al who presented their three years' experience of management of different types of rhinosporidiosis in rural part of western West Bengal. The objectives of this study were to assess the distribution of rhinosporidiosis according to age, sex, presenting features, site of origin, recurrence rate and compare them with literature; and describe the surgical technique to reduce recurrence of the disease.Out of total 112 patients 62 were male and 50 were female. Commonest age group affected was 2nd decade. There

was no recurrence in patients undergoing operation for the first time. Recurrence was noted in nasopharynx of 3 patients undergoing revision surgery.Complete removal of rhinosporidiosis from the base is the basic criterion to reduce recurrence. It is possible by using meticulous technique along with the guidance of endoscope or microscope whenever needed. Regular postoperative follow up with endoscope is must to detect and treat early recurrence.[10,11] Makannavar JH et al did a clinicopathological study of 34 cases. Men in 2nd, 3rd, 4th decade were commonly affected. Nose and nasopharynx were the commonest (85%) sites involved followed by ocular tissue (9%). One patient had involvement of bone (tibia). Generally a lymphoplasmacytic response was observed in all cases. Polymorphonuclear leukocytic response mostly observed at the site of rupture of sporangia. Epithelioid cell granulomatous and giant cell response observed in 47% of cases. Transepithelial migration of sporangia observed in 76% of cases. Rhinosporidium seeberi could be easily identified in haematoxylin and eosin stained sections. The walls of young trophic forms are delineated well with the PAS stain and verhoeff van Gieson stain.[12] Ahluwalia KB et al have been able to isolate the cyanobacterium Microcystis aeruginosa from water samples of ponds and river where patients of rhinosporidiosis were bathing. It is likely that this cyanobacterium is the causative agent of this disease. The bluish-green cells of M. aeruginosa also have a colorless small cell stage called nanocyte which has been detected in clear waters of all the pond and river samples studied. Both large cells and nanocytes of M. aeruginosa could be recognized inside the round bodies of rhinosporidiosis by light and electron microscopy.If therapy becomes available, no surgery would be required for this disease. It is suggested that the waters from ponds and lakes, as well as municipal and recreational waters, be checked for the nanocyte stage of M. aeruginosa. [13] Rhinosporidiosis is a condition which both clinicians and pathologists should keep in mind when managing patients from endemic countries with nasal masses. Many discussions arouse regarding the taxonomic classification of the microorganism, recent studies established it is an aquatic protistan parasite. The lesion may recur and sometimes cause osteolytic bone lesions. In endemic areas it is not easy to establish if recurrent lesions are due to relapse or reinfection.Recent advances in rhinosporidiosis and Rhinosporidium seeberi was done by Arseculeratne SN. Morelli L et al presented a case report on Rhinosporidiosis. Moreover, it is very interesting in such cases to follow the clinical course: an eventual recurrence of the lesion in our patient would mean a true relapse, excluding the possibility of a reinfection, more probable in the endemic areas. In conclusion, this is an infrequent Italian human case of rhinosporidiosis, rare cases being previously reported in the literature. [14,15] Satyanarayana C studied Rhinosporidiosis with a record of 255 cases. Chitravel V et al presented 3 atypical cases of rhinosporidiosis with complications . Frog-faced deformity and seizures were observed in one case, excessive bleeding, loss of olfactory sensation and septal perforation were noticed in the second case, while the third one exhibited a disseminated type of the disease. Anoop TM and Thappa DM also studied disseminated cutaneous rhinosporidiosis. In some cases rhinosporidiosis developed widespread asymptomatic nodular skin lesions. Cutaneous examination showed multiple, discrete, sessile and pedunculated, smooth and warty, friable nodular lesions of variable sizes and shapes. Histopathology of representative skin lesions showed hyperplastic epidermis with sporangia containing spores in the upper dermis diagnostic of rhinosporidiosis.[16-19]

Conclusion

The case study is presented to see the incidence and prevalence of rhinosporidiosis among nasal masses in Jhansi district and health awareness among common people for prevention, early diagnosis, treatment and decreasing reccurence rate after surgery of this disease.

What this study add to existing knowledge

Rhinosporidiosis is a granulomatous disorder caused by Rhinosporidium seeberi, an aquatic parasite. It spreads through contaminated water and soil. It frequently involves the nasal cavity and nasopharynx. Disseminated or systemic lesions are rare.

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