



## A study on Rhinosporidiosis cases attending a tertiary care hospital of Raipur City (C.G.) India

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### ABSTRACT

**Introduction-** Rhinosporidiosis is a chronic granulomatous disease caused by *Rhinosporidium seeberi* which was once believed to be a sporozoan and then was included in phycomyces. Rhinosporidiosis affects both man and animals. The highest incidence has been reported from India and Srilanka. The disease is water and dust borne in nature. Rhinosporidiosis patients give history of taking bath in muddy water, contaminated ponds, Tanks and Rivers. A high, incidence has been noted in cane sugar and paddy cultivators. The disease mainly affects people who live in agriculture and pond area.

**Material and method-** The present study consisted of Retrospective and prospective study of cases of Rhinosporidiosis in the department of pathology, Pt. J.N.M. Medical College Raipur (C.G.) India, during the study period 1994 to April 2004. Prospective study consists of cases of Rhinosporidiosis diagnosed from May 2004 to May 2005. Detailed history of every patient was taken with special regard to habits like bathing, swimming in local muddy water or working in stagnant water for source of infection. Primary and recurrent cases were noted. Detail of clinical examination regarding size and site was noted. Relevant laboratory investigations were performed. A biopsy from lesion or excised mass was received in formaline. Data was compiled in MS excel and checked for its completeness, correctness and then it was analyzed.

**Result-** The present study consists of 400 patients of Rhinosporidiosis cases. Out of the 400 cases studied there were 302 (75.5%) males and 98 were (24.5%) females. Maximum patients 172(43%) were in the age group of 21-30 years out of whom there were 137 (34.25%) males and 35 (8.75%) females. Out of 365 cases of nasal Rhinosporidiosis, 278 were male (69.5%) and 87 were female (21.75%). The frequency of nasal rhinosporidiosis was maximum in the age group of 21 - 30 years (162) cases and minimum in the age group of 51 - 60 years (4 cases) in cases of ocular Rhinosporidiosis. Out of 400 cases, maximum number of cases were agriculturists 252 cases (63%), followed by Students 60 cases (25%), labourer 36(9%) washerman 16 (4%), grain dealer 24, Railway employee 08 (2%), gardener 4 (1%) cases.

**Conclusion-** A higher incidence of rhinosporidiosis was seen in the Hindus and rarely in the other community. This might be due to the fact that Chhattisgarh region is predominantly populated by Hindu community. The incidence was found to be maximum in agriculturist.

### KEYWORDS

Rhinosporidiosis, Raipur, Chhattisgarh, Chronic Granulomatous Disease

### INTRODUCTION

Rhinosporidiosis is a chronic granulomatous disease caused by *Rhinosporidium seeberi* which was once believed to be a sporozoan and then was included in phycomyces. Rhinosporidiosis affects both man and animals. [1]

Rhinosporidiosis is most commonly seen in the nose, less frequently in the eye and rarely found in skin, larynx, palate, trachea, bronchus, inner end of Eustachian tube and maxillary sinus.

Rhinosporidiosis has been found in different countries like America, Africa, Philippines, Argentina, Brazil, Europe, and Pakistan.

The highest incidence has been reported from India and Sri Lanka. Rhinosporidiosis has been reported from different parts of India such as South India, Western India, Central India, Madhya Pradesh, Chhattisgarh, Orissa, Madras, Rajasthan and Calcutta. [2, 3]

The disease is water and dust borne in nature. Rhinosporidiosis patients give history of taking bath in muddy water, contaminated ponds, Tanks and Rivers. A high, incidence has been noted in cane sugar and paddy cultivators. The disease

mainly affects people who live in agriculture and pond area.

The first case of Rhinosporidiosis was discovered in 1892 by Professor Malbran of Buenos Aires in a specimen of nasal polyp but did not publish his finding. Later in 1984 he described the condition again in a specimen of nasal polyp.

The first case in India was observed in 1894 by O 'Kinealy' of Medical College Hospital, Calcutta. The first reported case in the literature was from Calcutta by Vaughn in 1902-03. He described it as psorospermiosis.

Rhinosporidiosis is a sporing organism and the life cycle has been described by kannankutty in 1974. He demonstrated that Rhinosporidiosis produce a substance similar to hyaluronidase, which helps spread of spore submucosally.

This fact in addition to factor like reinfection and difficult surgical access, explains high rate of recurrence after surgery. The infection caused by this organism has not been experimentally reproduced in animals and its etiological agent is yet to be cultured. Ash worth (1922) read his classical monograph, in which he traced the history of Rhinosporidium, gave an account of its structure and life history, geographical distribution

and described the histology of polyps. He came to the conclusion that it was not a sporozoan but belonged to the phycomyctetes sub order chytridinea and provisionally placed it near the olpidiaceae. He also established its proper name, when occurring in man as Rhinosporidium seeberi.

A more recent opinion has placed this organism with a novel group of fish parasites referred to as DRIP CLADE (Dermocystidium rosette agent, Ichthyophonus and Psorospermium) near the animal fungal divergence.

Rhinosporidiosis presents as an exophytic, branching, granular deep red pedunculated or sessile polypoidal growth resembling mulberry or strawberry in nose, nasopharynx, and conjunctiva, lacrimal sac rarely in urethra and even in the tracheo-bronchial tree. Though not a fatal disease it can cause varying degree of morbidity.

The growth is soft, friable and easily bleeds. The condition may be mistaken for malignancy, when it occurs in the aged.

Symptoms of the disease depend on the site of infection. In the nose symptoms are rhinitis, blood stained discharge, obstruction to breathing.

On histological examination of polypoidal masses thick walled sac of sporangia about 250 µm in diameters is seen. The sporangia contain numerous spores, which when released by rupture of sac escape into nasal secretion or nasal tissue. A granulomatous response may be seen. Overlying epithelium shows metaplasia, focal thinning and occasional ulceration. Spores and sporangia are seen on conventional sections stained by haematoxylin and eosin and are highlighted by periodic acid stain and methenamine silver stain. The disease does not respond to antibiotics and usually requires surgical intervention. A tendency to recurrence remains localized to the original site. Rhinosporidiosis mainly affects nose but can involve eye, pharynx, trachea, genitalia by autoinoculation or it may reach internal organ like the liver, spleen or bone by haematogenous and lymphatic spread. **[4-10]**

With the above background the present study was conducted to see the scenario of rhinosporidiosis cases attending a tertiary care hospital of Raipur city (C.G.) India.

**MATERIAL AND METHOD**

The present study consisted of Retrospective and prospective study of cases of Rhinosporidiosis. The retrospective study consists of slides of diagnosed cases of Rhinosporidiosis from cases reported in the past 11 years in the department of pa-

**Table No. 2**  
**Year wise incidence of Rhinosporidiosis in different age groups**

Age group in yrs.	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
0-10	Nil	04	01	07	07	02	01	01	01	04	06	06	42
11-20	01	07	08	12	07	07	03	04	18	17	24	13	120
21-30	17	12	06	12	08	10	19	16	13	25	24	11	172
31-40	02	01	02	03	03	07	08	03	04	07	13	Nil	53
41-50	Nil	Nil	Nil	01	Nil	01	Nil	01	Nil	01	01	02	07
>51	01	Nil	Nil	03	01	01	Nil	Nil	Nil	Nil	Nil	Nil	06
Total	21	24	17	38	26	28	31	25	36	54	68	32	400

Out of 400 cases, maximum number of cases i.e. 172 cases (43.0%) were in the age group of 21-30 years, followed by 120 cases (30.0%) in age group of 11-20 years, 53 (13.25%) cases in the age group of 31-40 years, 42 (1.5%) cases in the age group below 11 years. Minimum number of cases i.e. 6 cases (1.5%) were in the age group 51-60 years.

thology, Pt. J.N.M. Medical College Raipur (C.G.) India, during the study period 1994 to April 2004. Prospective study consists of cases of Rhinosporidiosis diagnosed from May 2004 to May 2005. Ethical considerations were met through institutional ethical committee.

Detailed personal history of patient's occupation, socio-economic status, personal habit and any history of trauma was taken.

Detailed history of every patient was taken with special regard to habits like bathing, swimming in local muddy water or working in stagnant water for source of infection. Primary and recurrent cases were noted. Detail of clinical examination regarding size and site was noted. Relevant laboratory investigations were performed. A biopsy from lesion or excised mass was received in formaline. The gross findings were noted. After noting the gross features a piece of tissue was processed for histopathology. (Haematoxyline and Eosion staining). Other special stains were also done.

1. Periodic acid Schiff.
2. Verhoeff van Gieson stain
3. Gomori Methenamine silver

Data was compiled in MS excel and checked for its completeness, correctness and then it was analyzed.

**OBSERVATION**

**Table No-1**  
**Age and sex wise distribution of cases of Rhinosporidiosis From May 1994- May 2005**

S. No.	Age group (in years)	Male		Female		Total	
		No	%	No	%	No	%
1	Up-10	26	6.50	16	4.00	42	10.50
2	11-20	81	20.25	39	9.75	120	30.00
3	21-30	137	34.25	35	8.75	172	43.00
4	31-40	49	12.25	04	1.00	53	13.25
5	41-50	04	1.00	03	0.75	07	1.75
6	51-60	05	1.25	01	0.25	06	1.50
Total		302	75.50	98	24.50	400	100.00

The present study consists of 400 patients of Rhinosporidiosis cases. Out of the 400 cases studied there were 302 (75.5%) males and 98 were (24.5%) females. Maximum patients 172(43%) were in the age group of 21-30 years out of whom there were 137 (34.25%) males and 35 (8.75%) females. In the older age group between (41-60) years there were 13 (3.2%) cases only. The youngest patient in this study was a boy of 9 years. **[Table-1, Figure-1]**

The mean age of patients in the present study was 26.16 years. Male were found to be more commonly affected females Out of 400 total cases of Rhinosporidiosis, there were 302 (75.5%) males, and 98 (24.5%) females with a male & female ratio of 3:1. **[Table-2, Figure-2]**

**Table -3**  
**Sites of involvement of Rhinosporidiosis**

Year	Site			
	Nasal	Eye	Skin	Total
1994	19	01	01	21
1995	20	04	Nil	24
1996	16	01	00	17
1997	36	01	01	38
1998	24	01	01	26
1999	25	02	01	28
2000	28	02	01	31
2001	23	02	Nil	25
2002	34	01	01	36
2003	48	06	Nil	54
2004	62	05	01	68
2005	30	01	01	32
<b>Total</b>	<b>365(91.25%)</b>	<b>27(6.75%)</b>	<b>8 (2.00%)</b>	<b>400 (100%)</b>

Different sites of involvement of Rhinosporidiosis is shown in table No. 3 Out of total 400 cases the maximum number of cases were of nasal rhinosporidiosis, the number being 365 (91.25%). The next common site of lesion was eye which was involved in 27 (6.75%) cases. Rare site of involvement was cutaneous 8 (2.00%) cases. **[Table-3, Figure-3]**

**Table-4**  
**The Relationship between site of Rhinosporidiosis and sex of Patients**

Site Sex Year	Nasal		Eye		Skin		Total of cases
	M	F	M	F	M	F	
1994	13	6	2	-	-	-	21
1995	14	6	2	01	-	01	24
1996	13	3	1	-	-	-	17
1997	25	11	2	-	-	-	38
1998	16	8	1	-	1	-	26
1999	16	9	1	1	1	-	28
2000	28	-	-	1	2	-	31
2001	18	5	2	-	-	-	25
2002	26	8	1	-	-	01	36
2003	42	6	5	1	-	-	54
2004	49	13	2	2	1	1	68
2005	18	12	1	1	-	-	32
<b>Total</b>	<b>278</b>	<b>87</b>	<b>20</b>	<b>7</b>	<b>5</b>	<b>3</b>	<b>400</b>
<b>%</b>	<b>69.5</b>	<b>21.75</b>	<b>5.00</b>	<b>1.75</b>	<b>1.25</b>	<b>0.75</b>	<b>100</b>

There was a male predominance at all the sites as shown in the table No. 4 and this association was stronger in case of nasal Rhinosporidiosis. Out of 365 cases of nasal Rhinosporidiosis, 278 were male (69.5%) and 87 were female (21.75%) out of 27 cases ocular Rhinosporidiosis, 20 were male (5.0%) and 7 were female (1.75%). There were 8 cases of cutaneous rhinosporidiosis out of which 5 were male (1.25%) and three female (0.75%). **[Table-4, Figure-4]**

**Table-5**  
**Age wise distribution of Rhinosporidiosis at various sites**

Age (in yrs)	<10	11-20	21-30	31-40	41-50	51-60	Total
<b>Site</b>							
Nasal	31	111	162	50	7	4	365
Eye	1	7	17	2	Nil	Nil	27
Skin	-	2	4	1	1	Nil	8
<b>Total</b>	<b>32</b>	<b>120</b>	<b>183</b>	<b>53</b>	<b>8</b>	<b>4</b>	<b>400</b>

The frequency of nasal rhinosporidiosis was maximum in the age group of 21 - 30 years (162) cases and minimum in the age group of 51 - 60 years (4 cases) in cases of ocular rhinosporidiosis, out of 27 cases maximum cases were found in the age group 21-30 years. No case was seen beyond 40 years of age. There were 8 cases of cutaneous rhinosporidiosis maximum incidence was seen in the age group of 51 - 60 years. Thus the frequency of rhinosporidiosis was higher in the age group of 21-30 years at all the sites. **[Table-5, Figure-5]**

**Table -6**  
**Relationship of Rhinosporidiosis with occupation**

S.No	Occupation	No. of cases
1	Agriculturist	252
2	Student	60
3	Labour	36
4	Washerman	16
5	Grain dealer	24
6	Railway employee	08
7	Gardener	04
	<b>Total</b>	<b>400</b>

Out of 400 cases, maximum number of cases were agriculturists 252 cases (63%), followed by Students 60 cases (25%), labourer 36(9%) washerman 16 (4%), grain dealer 24, Railway employee 08 (2%), gardener 4 (1%) cases. **[Table-6]**

**Table No. 7**  
**HISTOPATHOLOGICAL CHANGES OBSERVED IN RHINOPO-RISDIOSIS**

S.No.	Microscopic Features	No.	%
1	Squamous metaplasia	312	78
2	Papillomatous hyperplasia	288	72
3	Trans-epithelial migration	192	48
4	Crescent shape empty sporangia.	238	59.5
5	Sporangiospores released into tissue	240	60.0
6	Granulomatous response	98	24.5
7	Giant cell granuloma	126	31.5
8	Microabscess formation	68	17.01
9	Globular eosinophilic mucoid material	318	79.5
10	Lymphocyte and plasma cell response	400	100
11	Eosinophilic response	28	7
12	Necrosis	160	40
13	Fibrosis	200	50

Out of 400 cases, 312 (78%) showed squamous metaplasia, 288 (72%) papillomatous hyperplasia, 192 (48%) trans epithelial migration, 238 (59.5) crescent shape empty sporangia, 240 (60%) sporangiospores released into tissue, 98 (24.5%) epitheloid granulomatous response, 126 (31.05%) Giant cell granuloma, 68 (17.0%) microabscess formation, 318 (79.5%) globular eosinophilic mucoid material, 400 (100%) lymphocytes and plasma cells, 28 (7%) eosinophilic response, 34 (8.5%) histiocytes, 160 (40%) necrosis and in 200 (50%) cases fibrosis were observed. **[Table-7]**

**DISCUSSION**

Rhinosporidiosis is a chronic granulomatous disease. The main site of lesion in man are nose, nasopharynx, conjunctiva, and lacrimal sac, Other mucous membrane are not exempt, rarely the organism may be widely disseminated in the body.

Observation in our present study indicate that Rhinosporidiosis is quite common in Raipur, Durg, Bilaspur and Dhamtari Districts of Chhattisgarh state. A total of 400 histologically confirmed cases were noted during the period from 1994 May 2005. Out of these 365 (91.25%) cases had nasal involvement:

In a period of one-year study it was observed that a total of 100 cases of Rhinosporidiosis have been recorded including 91.5% cases with nasal involvement. Gupta et al (1971) recorded 75 cases of Rhino -sporidiosis every year. [11]

In the present study, maximum number of cases 172 (43%) were seen in the age group of 21-30 years. However cases were also common in the second decade of life. Similar high incidences in the second and third decade have been observed by many studies also. 42 cases (10.50%) were seen in the age group of 0-10 years. Similar low incidence has been observed in the age group by Satyanarayan, Agrawal S et al and Sengupta, De, Roy.[12, 13, 14] A slightly higher percentage than our was noted by Allen and Dave (31.6%).[15]

As regards the sex incidence males were more commonly affected than females with a male female ratio of 3:1. Such male preponderance was also observed by other authors. In most of the cases the male female ratio was similar to the present Series.

A higher ratio was seen by Purandare and Deoras (99:1). [16]

In the present series nasal involvement was seen in 365 out of 400 cases studied (91.25%). Similar high percentage of nasal involvement has been seen in the study by Allen and Dave (90%), Purandare and Deoras (97%). [10, 16]

A high incidence of rhinosporidiosis has been noted in paddy cultivators Karunaratne, has emphasised that rhinosporidiosis has no relation to the paddy crops as such but to the soil with which cultivators are brought into contact. The paddy cultivators are exposed not only to the dust emanating from the soil but also to the muddy water of the field and irrigation water which contain particles of soil in suspension. It is a common practice for these people to use water in an irrigation channel for bathing, washing etc. [17]

Our observation is similar. Majority of the patients were from rural area and gave history of taking bath in ponds in which domestic animals were also bathed.

By Karunaratne (1964) and present series out of 400 cases, 312 (78%) showed squamous metaplasia, 288 (72%) papillomatous hyperplasia, 192 (48%) trans epithelial migration, 238 (59.5) crescent shape empty sporangia, 240 (60%) sporangiospores released into tissue, 98 (24.5%) epitheloid granulomatous response, 126 (31.05%) Giant cell granuloma, 68 (17.0%) microabscess formation, 318 (79.5%) globular eosinophilic mucoid material, 400 (100%) lymphocytes and plasma cells, 28 (7%) eosinophilic response, 160 (40%) necrosis and in 200 (50%) cases fibrosis were observed. [17]

The inflammatory response to the parasites was also studied. Section showed the presence of inflammatory cell like polymorphs, lymphocytes, plasma cells foreign body giant cells and occasionally eosinophils.

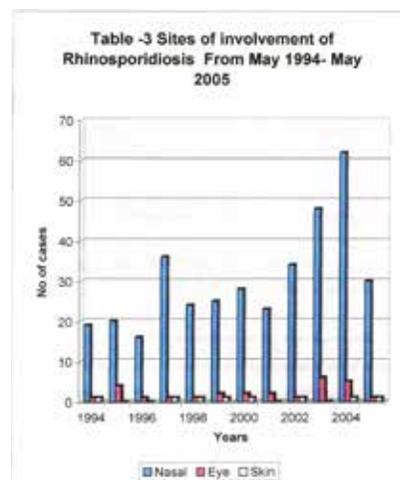
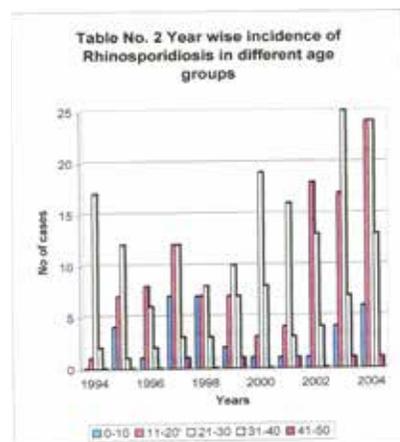
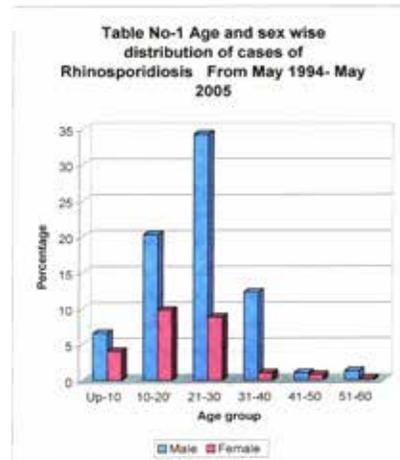
**CONCLUSION**

A higher incidence of rhinosporidiosis was seen in the Hindus and rarely in the other community. This might be due to the fact that Chhattisgarh region is predominantly populated by Hindu community. The incidence was found to be maximum

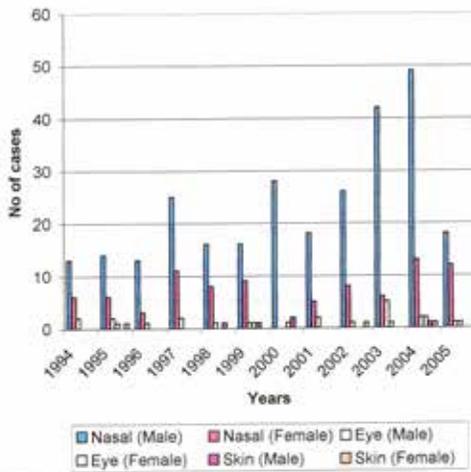
in agriculturist. Majority of the patients gave history of habit of taking bath in local muddy ponds. These ponds were also contaminated by domestic animals with when the human are likely to come in contact. Rhinosporidiosis is endemic in Raipur and other nearby districts of Chhattisgarh. There is a strong association with agriculture workers and those taking bath in stagnant muddy water. Further work needs to be done to prove the association with animals and with regards to its transmission.

**Acknowledgement**

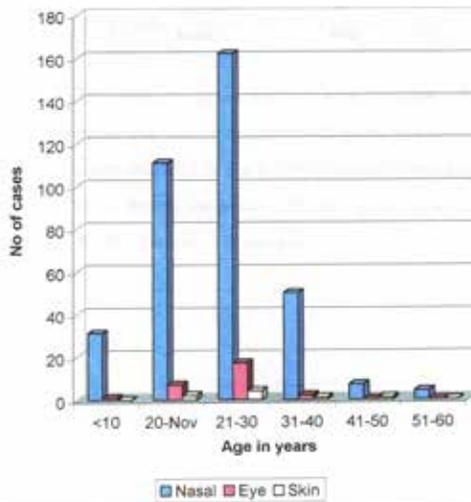
The authors are thankful to all the faculty and technical staff of department of Pathology, Pt. J. N. M. medical college, Raipur (C.G.) India, for their cooperation and support during the entire study period.



**Table-4 The relationship between site of Rhinosporidiosis and sex of patients from May 1994- May 2005**



**Table-5 Age wise distribution of rhinosporidiosis at various sites**



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