

# Rhinosporidiosis—An Epidemiological Study

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## ABSTRACT

**Introduction:** Rhinosporidiosis is a very common and hazardous problem of the South-east Asian region, which involves not only nose but also some other body areas. Though it's a very old disease, its post-operative recurrence is high and public awareness for eradication or control of the disease is not yet sufficient.

**Aim:** To assess the epidemiological data, clinical presentations, and recurrences of Rhinosporidiosis so that physicians can be guided to diagnose and treat the patients, and health education can be given to peoples of endemic areas to reduce the prevalence and spread of the disease.

**Materials and Methods:** It is an observational study done in the ENT Department of Chittagong Medical College, Chittagong, from March 2018 to February 2020. The sign-symptoms of the disease, rate of recurrence and outcomes of surgery, recurrence rate, etc. were analyzed.

**Results:** A very strong correlation was found between the disease and bathing at canals or ponds. Young Male gender was found significantly related to the disease. Almost all the patients came from low or middle socioeconomic society. Epistaxis with chronic nasal obstruction or nasal mass was found as the commonest clinical presentation.

**Conclusion:** Rhinosporidiosis is highly associated with rural residence, young male adults, and low socioeconomic status of the patients. The post-operative recurrence rate is high. Adequate surgical excision with wide base cauterization can reduce the recurrence rate. Social awareness programs and health education programs among the people of the endemic zone can reduce the incidence of the disease.

**Keywords:** Endemic zone, Epistaxis, Rhinosporidiosis, Rhinosporidiumseeberi, Recurrence.

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## INTRODUCTION

Rhinosporidiosis is a chronic granulomatous disease that commonly affects the nasal mucosa and ocular conjunctiva. Inoculation occurs through contact with water containing the aquatic protozoan *Rhinosporidiumseeberi*.<sup>[1]</sup> It occurs mostly in the young age group, but the older age group's involvement is noted. Males are affected more. It occurs along with the coastal areas of tropical countries like India, Srilanka, Bangladesh, Africa, and South America.<sup>[2]</sup> Most of the patients are farmers. Usually, nose contains vascular mulberry like polypoidal masses which may bleed on touch, are friable, and commonly attached to the septum or turbinates.<sup>[3]</sup> Sometimes mass may track backward into the Naso or Oropharynx. Nasolacrimal duct systems are involved too. Trachea or Genitals may be occasionally affected. By blood spread, it may reach to liver, spleen, or skin.<sup>[4]</sup> Exact mode of spread is unknown. But the spread is likely via dust mixed with dung of the cattle or contact with contaminated water while bathing.<sup>[5]</sup> Trauma is a pre-disposing condition—medicines don't help. Surgical excision with a diathermy knife and cauterization of the base is performed and found as an effective treatment.<sup>[6]</sup> But because of bleeding and tendency to spread, recurrences are quite common. Endoscopic surgery helps to identify the pedicles and thus reduces the chances of recurrence. The endoscopic examination also helps to identify the sites of recurrences.

This present study is designed to document the epidemiological and clinical profiles of the Rhinosporidiosis patients.

## MATERIALS AND METHODS

This Observational study was conducted from 1<sup>st</sup> March 2018 to 28<sup>th</sup> February 2020 at ENT Department. of Chittagong Medical college hospital with support from Ophthalmology, Pathology, and Microbiology depts. During the study period, all cases that were diagnosed as rhinosporidiosis were confirmed by the histopathological report. The excised soft tissue masses were sent for Histopathological examination using hematoxylin and eosin staining.

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Patients were thoroughly examined, medical documents were checked, and noted, new investigations have done where possible and needed. A diagnosis was made based on a detailed history, clinical examination and investigations including X-ray Nose and Paranasal Sinuses, CT Paranasal Sinuses, Diagnostic nasal endoscopy, and histopathological examination. Patients interviews were documented in a pre-designed datasheet and questionnaire.

We followed up all the Patients regularly at an interval of 2-week, 1-month, 3-month, 6-month, and after 1-year of surgery. We have done Diagnostic Nasal endoscopy on all the followup patients.

## RESULTS

The study was done with a sample size of 50 cases of Rhinosporidiosis. This Observational study was done at the ENT department of Chittagong Medical College, Chittagong, from March 2018 to February 2020.

In our study, the maximum patients affected were young adults with the age range of 11-20 years. The total number of patients in this age group was 14 out of 50, which was 28% of total patients. Patients in extremes of age were found very less. We found only two patients in 1-10 age group and again, two patients in > 60 age group. We found that the disease is Male predominant. Total 39 (78%) patients were male.[Table 1]

It is very significant in the study that we found only 4 patients who reside in the urban area. All other reported patients came from rural or suburban areas.[Table 2]

There is a significant relationship between the bathing pattern and the spread of the disease. All the patients had a bathing history at rural ponds, rivers, or canals. Only 2 patients didn't give any history of bathing in outdoor natural water sources.[Table 3]

Patient's socioeconomic status is highly significant with the Rhinosporidiosis as all the patients came from low or middle-income families.[Table 4]

**Table 1:** Age and Sex distribution

Age group	Male	Female	Total
1-10	02	00	02
11-20	11	03	14
21-30	09	02	11
31-40	06	03	09
41-50	07	02	09
51-60	03	01	04
>60	02	00	02
Total	39	11	50

**Table 2:** Residence of the patients

Residence	Number
Rural	37
Suburban	09
Urban	04

**Table 4:** Socioeconomic Status

Socioeconomic Status	Number
Low	27
Middle	22
High	01

**Table 6:** Clinical features

Presenting features	Number
Nasal Mass	33
Epistaxis	44
Nasal Obstruction	31
Nasal Discharge	39
Change of voice	01
Mass in the Eye	03
Watering of Eye	02
Stridor	01
SupraGlottic Mass	02
Oral Lesion	03
Tracheal Mass	01
Dysphagia	02
Headache	02
Haemoptysis	03

We found that those who are involved in outdoor works like farmers, fishermen etc. were involved most. Within 5 housewives 2 were involved in outdoor activities with their husbands .within 17 students, we found that 9 were also involved in outdoor peddy fields or farming with their families.[Table 5]

In our study, a total of 44 patients ( 88% ) came with epistaxis. Some patients complained about nasal masses .we diagnosed nasal masses in other patients who came with the feature of nasal obstruction, discharge or epistaxis. Total 33 patients (66%) presented with nasal mass. Three patients came with hemoptysis, in whom 2 were supraglottis lesions, and the rest one was involved with a mass in the Trachea. The patient with tracheal mass came with the complaint of Stridor too. One patient came with soft palate involvement, and two patients came with buccal mass. Three patients came with involvement at the lacrimal duct system. within33 patients (66%) who came with True nasal involvement, a total of 25 patients (75.75%) came with unilateral nasal involvement. Rest ( 8 in number) came with bilateral nasal problems. [Table 6]

In our study, we found one patient who was operated seven times before. Recurrence is high as we got 24 patients with recurrence, which is about 48% of total patients. The rest 26 patients ( 52% ) were operated 1<sup>st</sup> time. Recurrent 24 cases found that six patients ( 25% ) came with recurrence at multiple sites. Significantly, all the Recurrent patients gave the history of bathing at ponds or canals.[Table 8-11]

**Table 3:** Bathing history of the patients

Bathing history	Number
Ponds	28
Rivers	06
Canals	12
House bathroom	02

**Table 5:** Profession of the patients

Occupation	Number
Farmer	11
Fishermen	12
Laborer	04
Student	17
Housewife	05
Others	01

**Table 7:** Site of Distribution

Site	Number
Lateral wall of the nose	15
Floor of the Nose	09
Septum of the Nose	09
Nasopharynx	02
Lacrimal apparatus	03
Trachea	01
Larynx	02
Soft palate	01
Buccal mucosa	02
Multiple sites	06

**Table 8:** Laterality

Laterality	Number
Unilateral	25
Bilateral	08

**Table 9:** Recurrence

Number of Surgery	No. of Patients
1 <sup>st</sup> time Surgery	26
Previously operated Once	13
Previously operated twice	05
Previously operated thrice	05
Previously operated 7times	01

**Table 11:** Bathing history of Recurrent cases

Bathing history	Number of patients
Ponds	20
Canals	04
Total number - 24	

## DISCUSSIONS

This is a chronic granulomatous disease that commonly affects the nasal mucosa and ocular conjunctiva.<sup>[7]</sup> Seeber first described it in Argentina in 1900<sup>[8]</sup> it is endemic in south-East Asia, South America, and Africa. Men are affected more than female with a male to female ratio of 4:1. Intranasal polyps occur with infection of the sinonasal region.<sup>[9]</sup> Cutaneous & disseminated forms of the disease also occur. Inoculation occurs through contact with water containing the aquatic protozoan *Rhinosporidiumseeberi*. Formerly thought to be a fungus, *Rhinosporidium* is now attributed to a novel class of waterborne protozoan parasites called *Mesomycetozoa*.<sup>[10]</sup> But still debatable.

The disease progress with a local replication *R. seeberi* and associated hyperplastic growth of host tissue. Toriyama *et al* (1995) said the organism is present in the cowdung of animals like cows, buffalo, dogs etc.<sup>[11]</sup> if the people take a bath in the pond or river infected with the organism, they can get this infection. The sites of involvement are Nose & nasopharynx (70%), conjunctiva and lacrimal apparatus (15%) and mouth, upper airway, skin, genitals and rectum (15%).<sup>[12]</sup>

Diagnosis is clinical or with pathological analysis of the excised lesion because of no culture method exist.<sup>[13]</sup> Yet it is not possible to culture the organism or transfers the disease to experimental animals. Biopsy material reveals Sporangia like structure which is round or oval in shape, are filled with spore type material bursting through its wall.<sup>[14]</sup>

There is no medical treatment. The lesions must be excised as that's the sole form of treatment. Surgical excision with a diathermy knife and cauterization of the base is performed & found as an effective treatment.<sup>[15]</sup> But because of bleeding and tendency to spread, recurrences are quite common. Endoscopic surgery helps to identify the pedicles and thus reduces the chances of recurrence. The endoscopic examination also helps to identify the sites of recurrences.<sup>[16]</sup>

In our study, we found that maximum patients were in 11-20 and 21-30 age groups. And maximum patients came from poor or middle socioeconomic conditions. In our observation, young people of middle or poor families are active personnel as they are involved in outdoor activities for income and got contaminated.

Males are more prone to develop the disease. From detailed history, we got to know that most of them are farmers & fishermen. Many of them had cattles in their houses. Almost all of them have given the history of bathing at Ponds, canals, rivers, etc. So, it is our observation that males are used to taking care of their cattle, used to wash those cattles in the ponds, canals and later those people take their bath there. This regular habits are contaminating other males too.

**Table 10:** Site of Recurrence

Site of Recurrence	Number of Patients
Single Site	18
Multiple Site	06

As there is no history or prove of person to person contamination, females were contaminated less. Usually, females stay at home, and a maximum of them had a habit to take a bath at tape water of their house, leading to a lower incidence of disease in them. We got only 5 housewives (10%) within 50 patients. 2 of them were involved with their husbands in outdoor activities like cattle raising, peddy fields, farming, etc.

The highest number of patients came with the history of epistaxis, which is 44 in number (88%). A vast majority of patients came with co-existing nasal mass & nasal obstruction. 03 patients came to us with hemoptysis. After a complete examination with Nasoendoscopy and FOL, we found that 2 of them were having Supraglottic Rhinosporidiosis mass. The rest one also presented to us with stridor. After a thorough examination and Negative endoscopy and FOL, we planned for Tracheostomy. Just after opening in the anterior wall of trachea, we got the Rhinosporidiosis mass at the site and removed that.

We found that total of 33 patients came with nasal mass. On which, we found maximum mass originates from the lateral nasal wall, which 15 in number. The rests originated from floor or septum of nose. Total of 6 patients came with multiple sites of origin. Majority of the patients presented with unilateral nasal masses. Only 8 patients presented with bilateral nasal masses.

We found that the recurrence rate is very high. We got 24 patients with recurrence, which is about 48% of total patients. The rest 26 patients ( 52% ) were operated 1<sup>st</sup> time. We found one patient who was operated 7 times before. Within Recurrent 24 cases, we found that 6 patients ( 25% ) came with recurrence at multiple sites.

It is alarming that we have taken a detailed history of the recurrent cases & found that all of the patients had the bathing history at ponds or canals.

It is obvious that, precautions like avoidance of bathing at the stagnant waters like pond or canals can reduce infection & spread of the disease. This avoidance is very much necessary to reduce recurrence too. Washing of cattle in the ponds & using the water of those ponds or same source of water for household activities should be discouraged. Government and NGOs should come forward to educate the peoples of endemic zone about Sanitation, General health, and hygiene. Govt should take steps to ensure piped water supply to the endemic rural areas. Washing or bathing in the Canals, Ponds or rivers should be avoided.

## CONCLUSION

This study reports the infection affects the Younger Male population like farmers, fishermen or students of Rural or suburban areas. Nasal cavity involvement was found in most of the patients with the complaint of epistaxis and nasal mass. Excision with wide base cauterization was found the curative treatment though a large number of patients came with recurrence. All the recurrent cases were found with the history of bathing at ponds or canals. Community awareness and government initiatives can reduce the prevalence or spread of the disease.

## ETHICAL APPROVAL

The Institutional Ethics Committee approved the study.

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