PREVALENCE OF RHINOSPORIDIOSIS OF THE EYE AND ITS ADNEXA IN NEPAL

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Abstract. This study describes the clinical features, diagnosis, and treatment of rhinosporidiosis of the eye and its adnexa in a series of 76 cases in Nepal and six originating in India. The disease caused by the fungus Rhinosporidium seeberi was seen most frequently in young children between eight and 10 years of age. Males were infected more than females (2.5:1). The conjunctiva was the most common site of infection in 76 (92.68%) of the cases. The lacrimal sac was affected only in six (7.32%) cases. Simple total excision of the conjunctival polyps gave highly satisfactory results in cases of conjunctival sac infections. Except for one patient, there were no recurrences in the 76 cases. Meticulous excision of polyps provided a satisfactory result in the treatment of six cases with lacrimal sac infection. Recurrence was noted in one of these six cases followed up to two and a half years after surgery. The conditions diagnosed clinically were confirmed by histopathology. This review of 82 cases is the first such report of rhinosporidiosis from Nepal.

Rhinosporidiosis is a chronic and localized infection of the mucus membranes caused by the fungus Rhinosporidium seeberi. The fungus forms round and thick-walled sporangia in the submucosa of the affected site, varying from 10 to 200 mm in size, which are visible as white dots in the mucosa. The mature sporangium is filled with numerous spores, each of which on release develops into a separate sporangium.

Rhinosporidium seeberi can cause infections of the nose, throat, ear, and even the genitalia in both sexes. However, ocular rhinosporidiosis, the infection affecting the eye and its adnexa, is the most common manifestation. Ocular rhinosporidiosis is worldwide in distribution but relatively more common in India and Sri Lanka. However, this condition has not been reported from Nepal. We document and report for the first time the prevalence of oculosporidiosis in this country. This paper reviews the clinical manifestations, diagnosis, epidemiology, and treatment of rhinosporidiosis of eye and its adnexa in a series of 82 cases in Nepal.

CASES, MATERIALS, AND METHODS

A total of 82 cases of ocular rhinosporidiosis treated at the Sagarmatha Chaudhary Eye Hospital in Lahan, Nepal and the B. P. Koirala Institute of Health Sciences in Dharan, Nepal during a period of four years were included in the study. Included were 42 cases confirmed by histologic examination of hematoxylin and eosin–stained sections of biopsy samples of polyps. Histopathologic analysis was not performed in 40 cases. These cases were diagnosed only by clinical features. The clinical features, diagnosis, epidemiology (geographical distribution, age, sex, prevalence), and treatment of those cases were studied and analyzed.

Permission to conduct this study was obtained from the Head of Institutions at the Sagarmatha Chaudhary Eye Hospital and the Rector of the B. P. Koirala Institute of Health Sciences.

RESULTS

Rhinosporidiosis of eye and its adnexa were unilocular in all 82 patients. Both right and left eyes were almost equally affected. Of the 82 cases, 76 (92.68%) had R. seeberi infection of the conjunctiva and six (7.32%) had infection of the lacrimal sac (Figure 1).

Rhinosporidiosis of the conjunctiva. Seventy-six cases had Rhinosporidium infection of the conjunctiva (Figure 2). These patients presented with complaints of polypoidal growth of the conjunctiva protruding through the palpebral aperture. Ninety-five percent of the patients had a history of taking a bath in pond water. However, these patients however did not have a history of any other rhinologic problems.

Patients came for treatment when they themselves or their relatives noticed a fleshy growth protruding through the palpebral aperture. The conjunctival lesions were characterized by either polypoidal or flattened growth depending upon sites of the lesion. Those arising from the fornices and from bulbar conjunctiva were flattened due to lid pressure against the eye ball, whereas those arising near the lid margins and protruding through the palpebral apertures were polypoidal. The polyps were soft and pink and showed numerous gray–white spots on their surfaces. These spots, which looked like minute white fish eggs, were the mature spores. These were pathognomonic of the condition. Other polyps that were protruding through the palpebral aperture showed gray-brown pigmentation on their surfaces. All were very vascular and they bled even on touch. When these polyps were excised, the bleeding from their sites of pedicular attachment was relatively severe.

Of the 76 conjunctival polyps, 59 (77.6%) were attached to the palpebral conjunctiva (36 to the upper lid and 23 to the lower lid), seven (9.2%) to the fornices (two to the upper fornix and five to the lower fornix), six (7.9%) to the bulbar conjunctiva (two to the superior, one to the nasal, and three to the temporal), two (2.67%) to the plica semilunaris, and one each to the caruncle and marginal strip. These were attached to the conjunctiva with a thin stalk that did not extend 5 mm in length. The size of polypi varied from three to 40 mm in length. All were painless. In all cases, the rest of the conjunctiva was normal.

Infection of the lacrimal sac by Rhinosporidium seeberi. Six patients had an infection of the lacrimal sac. These cases presented with complaints of purulent discharge and occasional bleeding from the nose and eye. None of them complained of pain or gave a history of any other ocular prob-
lems such as conjunctival infections. The patients also gave a history of taking baths in pond water.

All six cases presented with swelling of the surface area around the lacrimal sac and the adjoining lower eye lid. Although appearing as simple dacryocystitis on cursory examination, these lesions showed certain peculiarities. These swellings were soft and fluctuating to touch. On applying pressure over the area of swelling, there was regurgitation of fluid from the puncti and also from the nose, indicating a patent nasolacrimal drainage system. The regurgitated fluid was characteristic. It was neither purulent nor mucoid, but was slimy and sprinkled with fine, white, granular particles.

On firm pressure, a soft mass could be felt inside the lacrimal sac. Firm digital pressure also caused bleeding from the nose and the puncti in all six cases. On opening the sac, pink vascularized growths with finger-like extension was seen in all the patients. Typical white spots on the surface gave the growth an appearance resembling that of bunches of fish eggs. The growth was limited to the lacrimal sac in three cases, and the growth had spread to the surrounding tissues in the other three cases. There was severe bleeding on surgical excision of the polyps.

**Histopathology.** Excision biopsy samples of polyps were obtained from only 42 cases. All these cases were confirmed as rhinosporidiosis by histopathology (Figure 3). Excised polyps on microscopic examinations showed fibrocellular tissue, covered by proliferated stratified epithelium. These contained innumerable sporangia of all sizes in the subepithelial layer. The cysts were lined by epithelium derived from the conjunctiva. Some of the sporangia were found to be empty while others contained spores in large numbers that could be seen pouring into the surrounding granulation tissues. Some of the cysts were organized, surrounded by giant cells and mononuclear cells.

**Epidemiology.** *Geographic distribution.* Seventy-four (90.24%) patients were from the Saptari, Siraha, and Dhanusha districts of Nepal (Table 1). One patient was from the Mahottari district and one was from the Morang district. The other six cases came from regions of India bordering Nepal.

**Age and sex distribution.** The condition was more common in males than in females (Table 2). The ratio of males to females was 2.5:1. In females, the condition occurred most commonly in the first decade of life, in which it was more common in children between six and 10 years of age. The youngest female patient was 1.5 years old and the oldest was 21 years old. In males, the condition occurred in all the age groups except in those 30–50 years old. The youngest male patient was also 1.5 years old and the oldest was 62 years old.

**Treatment.** Conjunctival polyps in all the cases of *R. seeberi* infection of the conjunctiva were excised using a topical surface anesthesia (4% xylocaine drops). The polyps were
FIGURE 3. Histologic section of a mature sporangium of *Rhinosporidium seeberi* containing numerous endospores (hematoxylin and eosin stained, magnification × 1,000).

Table 1: Geographic distribution of ocular rhinosporidiosis in Nepal (76 cases) and India (6 cases)

<table>
<thead>
<tr>
<th>Area</th>
<th>No. (%) of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saptari District</td>
<td>38 (46.34)</td>
</tr>
<tr>
<td>Siraha District</td>
<td>26 (31.70)</td>
</tr>
<tr>
<td>Dhanusha District</td>
<td>10 (12.20)</td>
</tr>
<tr>
<td>Mahottari District</td>
<td>1 (1.22)</td>
</tr>
<tr>
<td>Morang District</td>
<td>1 (1.22)</td>
</tr>
<tr>
<td>India</td>
<td>6 (7.32)</td>
</tr>
<tr>
<td>Total</td>
<td>82 (100.00)</td>
</tr>
</tbody>
</table>

Table 2: Age and sex distribution of ocular rhinosporidiosis

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5</td>
<td>10 (12.19)</td>
<td>6 (7.31)</td>
<td>16 (19.51)</td>
</tr>
<tr>
<td>6–10</td>
<td>30 (36.58)</td>
<td>11 (13.41)</td>
<td>41 (50.00)</td>
</tr>
<tr>
<td>11–20</td>
<td>13 (15.85)</td>
<td>5 (6.09)</td>
<td>18 (21.95)</td>
</tr>
<tr>
<td>21–30</td>
<td>3 (3.65)</td>
<td>1 (1.21)</td>
<td>4 (4.88)</td>
</tr>
<tr>
<td>31–60</td>
<td>2 (2.43)</td>
<td>0 (0)</td>
<td>2 (2.44)</td>
</tr>
<tr>
<td>61–70</td>
<td>1 (1.21)</td>
<td>0 (0)</td>
<td>1 (1.22)</td>
</tr>
<tr>
<td>Total</td>
<td>59 (71.95)</td>
<td>23 (28.05)</td>
<td>82 (100.00)</td>
</tr>
</tbody>
</table>

This study documents and reports for the first time the incidence of ocular rhinosporidiosis in this region of Nepal. In this study, the infection was found to be common in the southeastern part of this country. More than 90% of cases in this study were from three adjoining districts of Saptari, Siraha, and Dhanusa.

Ocular rhinosporidiosis is usually suspected in children presenting with conjunctival polyps and chronic dacryocystitis. In the present study, the infection was seen most frequently (51%) in children between three and 10 years of age, unlike the higher prevalence in those 15–39 years of age reported from India and Sri Lanka.1,4 Males were infected more than females (2.5:1) in this study, which is consistent with similar observations reported in other studies.1,4,6

Rhinosporidiosis is an example of a water-borne disease,7 and the fungus is suspected to be present in stagnant water of ponds, rivers, etc. In this study, 95% of the patients provided a history of taking baths in local ponds.

The conjunctiva are the commonest sites of infection but the lacrimal duct, lid, and sclera may also be affected by ocular rhinosporidiosis.8 In this study, the majority of the
infections were confined to the conjunctiva and only six cases were in the lacrimal sac. No other sites in the eye were involved.

Surgical removal of the lesion is the treatment of choice.\textsuperscript{4,6} In this study, simple total excision of the conjunctival polyps gave highly satisfactory results. Of 76 patients, 75 had no recurrences. Only one, a five-year old girl, had a recurrence of the polyps at the same site in palpebral conjunctiva after two years. This was probably due to incomplete removal of polypi in the first excision. She had no recurrence after the second excision. Cauterization with 2% silver nitrate solution or 2% titrated antimony solutions, as recommended in earlier studies,\textsuperscript{1,4,9} appears to be not necessary. Excision of lacrimal sac polyps has been reported to be unsatisfactory by Kuriakose.\textsuperscript{4} It is recognized that surgical removal of polyps is frequently difficult due to occurrence of severe bleeding at sites of the excised polyps. Nevertheless, in this study, keeping the excised area dry in combination with meticulous excision of polyps provided satisfactory results. All six cases were followed-up regularly for a period varying from five months to 2.5 years after surgery. In only one case did a recurrence occur after one month. The results of this study do not agree with observations of earlier studies,\textsuperscript{4,6} which indicated that a recurrence is inevitable. The washing of the exposed surfaces of polyps with 2% silver nitrate solution and treatment with systemic penicillin, as recommended by other investigators,\textsuperscript{1,4} appears to be unnecessary.

In this study, 42 cases of rhinosporidiosis were confirmed by the histopathology and 40 cases were diagnosed only by clinical features. Since facilities for histopathologic analysis in peripheral hospitals are not always available, it is suggested that histopathologic examination of polyps be carried out only on doubtful cases, in which the clinical diagnosis of rhinosporidiosis appears to be difficult.

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