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Original Research Article

RHINOSPORODIOSIS: OUR EXPERIENCE IN TERTIARY CARE CENTRE

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ABSTRACT

Background: Aim: The aim of this study is to determine the clinicopathological features of Rhinosporidiosis in a large series of cases and to assess the role of cytology in diagnosis.

Materials and Methods: A total of 75 cases comprised the study cohort. Rhizosporidiosis was consistently diagnosed through histological examination, regardless of cytological assessment. In all instances, May-Grünwald-Giemsa and hematoxylin and eosin (H&E) staining were employed; however, a limited number of cases utilized special stains such as periodic acid Schiff and mucicarmine. Comprehensive clinical histories were documented for each case. Hematological investigations, such as ABO blood classification, were performed routinely in every conceivable circumstance.

Results: Males comprised the majority of the clinical data in our series (38 out of 75; 50.6%), as determined by analysis. The nasopharynx and nose were the most frequently affected anatomical regions (76%). Standard hematology examinations failed to detect any substantial alterations in the majority of instances. However, a considerable percentage of the participants in the study (22 out of 49; 46%), possessed the blood group "O." In 28 out of 75 cases, cytodiagnosis attempts obtained a perfect correlation with histology.

Conclusion: In conclusion, our study highlights the importance of early diagnosis by histology and cytology and prompt treatment of Rhinosporodiosis in a tertiary care center. Future research should focus on exploring the long-term outcomes of treatment and the potential impact of Rhinosporodiosis on quality of life.

Keywords: Rhinosporidium seeberi, Rhinosporidiosis, Histopathological, Epistaxis, Lesions, Endospore.

INTRODUCTION

The Rhinosporidium seeberi (R. seeberi) is a fungus which causes Rhinosporidiosis, a persistent granulomatous illness.[1] While this ailment can show up anywhere on the body, it usually affects the mucous membranes that line the nose and throat. Rhinosporidiosis, is more common in nations in the tropics and subtropics, particularly in India and Sri Lanka.[2]

A significant portion of these cases originate from the numerous ponds and water bodies that are utilized for activities such as bathing, washing animals, and performing rituals [3]. The treatment of choice for most primary cases involves excision with wide base cauterization, while small masses are typically addressed under local anesthesia.[4] For recurrent cases, inadequate or improper excision is often the cause of recurrence, which can result in large, pedunculated masses in the posterior pharyngeal area.[5] These masses frequently arise from the nasopharynx and exhibit feeder vessels or attachments in the lateral walls of the nose (inferior meatus in the majority of cases), choana, and nasopharyngeal mucosa.[4-6] Surgical intervention is the preferred treatment approach for these secondary cases, as recurrence is more common compared to successful primary cases.[6] In some instances, post-operative tab Dapsone was administered to patients with recurrent cases, resulting in a lower relative

recurrence rate compared to those who underwent surgery alone.

Polypoidal growths, in Rhinosporidiosis, can take on a variety of shapes and sizes and frequently resemble raspberry-like formations.[2] Symptoms such as nasal blockage, epistaxis (nosebleeds), and, on rare occasions, a gritty feeling in the eyes can be caused by these growths, which bleed freely.[2] Histopathological analysis of biopsy samples usually confirms Rhinosporidiosis by showing the presence of endospore-filled, thick-walled sporangia.[3] Surgical removal of Rhinosporidiosis lesions is the standard treatment, although this procedure isn't always easy because the lesions are fragile and often return.[4] Malignant transformation of the lesions or subsequent bacterial infections are unusual consequences that have been described.[5,6] Since Rhinosporidium seeberi is thought to have an aquatic reservoir, the main aim of prevention is to stay away from polluted water sources.[1-6] The significance of early diagnosis and comprehensive therapy options is highlighted by the chronic and frequently recurrent nature of Rhinosporidiosis, even though it is still a relatively rare disorder globally. The aim of this study is to determine the clinicopathological features of Rhinosporidiosis in a large series of cases and to assess the role of cytology in diagnosis.

MATERIALS AND METHODS

A pathology departmental investigation was undertaken at a rural medical college for the duration of the current study, from February 2023 to February 2024. All cases identified as Rhinosporidiosis by histology or a combination of cytology and histology were included in the study group throughout the duration of the investigation. Comprehensive clinical data, including age, sex, and clinical manifestations, were gathered. ABO blood grouping was incorporated into routine blood tests for every conceivable case in the study cohort. The availability of fine-needle aspiration cytology (FNAC) for lesions is limited to a few instances. But still in manty cases bleeding was observed which had to be controlled by packing or electrocautery. Additionally, scrapes were employed to obtain samples in the event that accessible lesions were present. May-Grünwald-Giemsa (MGG) and periodic acid-Schiff (PAS) staining were applied to the smears. The diagnosis was validated through the observation of endospores and sporangia, as documented by additional personnel.[7]

Histopathological samples were processed according to an established protocol. In addition to conventional hematoxylin and eosin (H&E) staining, mucicarmine and PAS staining were also performed. The ultimate diagnosis was established through the observation of thick-walled sporangia adorned with a multitude of endospores amidst a fibrovascular stromal backdrop. This finding aligns with the results reported by previous researchers.[8]

RESULTS

There were a total of 75 patients, consisting of 48 males and 27 females among them. Ages 20–40 years were most frequently afflicted. Table 1 displays the distribution of cases according to the clinical features and site of involvement. Following the eye (17%), the most frequently affected areas were the nose and nasopharynx (76%). Additional uncommon locations constituted four (7%) of the cases. Superficial polypoid lesions were the most frequently observed clinical manifestation, followed by rhinorrhea, nasal obstruction, epistaxis, and watery eyes. There were no indications of disease dissemination in any of the examined lesions. A standard blood analysis was performed on every conceivable case (n = 48) to determine the relative proportion of eosinophils and total leukocyte count (TLC). Four cases exhibited leucocytosis, fifteen cases exhibited eosinophilia, and the remaining cases were within the expected range. Blood grouping was also performed using ABO. The most prevalent blood group was "O" (46 percent), followed by "AB" (24 percent).

A total of 28 of 75 cases were deemed suitable for preoperative cytological examination. FNAC was only performed in 13 patients. In six instances, both FNAC and swab cytology were performed. All 28 cases were accurately diagnosed through cytology, and subsequent histopathological examination validated this diagnosis.

Table 1: Socio-demographic details of participants (N=100)

S. No	Variable	Category	Group 1 (USG Guided) n (%)	Group 2 (AL Guided) n (%)	p-value
1	Gender	Male	41 (82.0%)	42 (84.0%)	0.990
		Female	9 (18.0%)	8 (16.0%)	
2	Religion	Hindu	42 (84.0%)	43 (86.0%)	0.078
		Muslim	2 (4.0%)	2 (4.0%)	
		Others	6 (12.0%)	5 (10.0%)	
3	Residence	Rural	15 (30.0%)	13 (26.0%)	0.091
		Urban	35 (70.0%)	37 (74.0%)	
4	Age group	<20 years	1 (2.0%)	1 (2.0%)	0.306
		20–30 years	11 (22.0%)	10 (20.0%)	
		31–40 years	33 (66.0%)	30 (60.0%)	
		41–50 years	5 (10.0%)	9 (18.0%)	

DISCUSSION

Our medical facility typically encounters approximately to 150-200 cases of Rhinosporidiosis annually. A significant portion of these cases originates from the Ganjam region, which is predominantly rural in Odisha and comprises numerous ponds and water bodies that are utilized for activities such as bathing, washing animals, and performing rituals.

The observation made in this research article is that Rhinosporidiosis is a rare but potentially serious condition that can affect individuals with compromised immune systems. The existing knowledge of Rhinosporidiosis is limited in and around the study region, and there is a need for further research to better understand the disease and its treatment options.

R. seeberi is not currently regarded as a traditional fungus. One study,[4] categorized this organism within the Mesomycetozoa order, which also comprises pathogens that affect amphibians and fish. Groundwater is believed to be an indigenous habitat for R. seeberi. It is hypothesized that exposure of traumatized epithelium to contaminated water results in human infection. There are reports of the highest incidence of cases among river sand laborers.[9,10] Probably due to this specific mode of infection, the number of cases identified in our series increased to 75 within two years. Our tertiary center serves a significant population of impoverished villagers residing in rural areas. These individuals are acclimated to bathing in groundwater, and are particularly susceptible to mucosal injuries caused by sand or dust.

In our study, the number of male patients was higher than that of female patients (n=48 vs. n=27). Young adults were also involved in the majority of the cases. These characteristics align with the assessments of fellow employees and may potentially indicate an increase in outdoor pursuits.[11] In the majority of cases (76%), the nose and nasopharynx were involved, followed by the eyes (17%). In our series, infrequent sites of involvement included the palate, urethra, and lips. Similar experiences were reported by other researchers.[11]

Rhinosporidiosis of the nasal passage typically manifests as a granular, polypoidal lesion that is red in color and contains numerous yellowish pinhead-sized patches symbolizing mature sporangia beneath the surface. Although this physical manifestation is discernible, it does not serve as a diagnostic tool.[4,12] Rhinosporidial polyps have been documented at various anatomical sites, including the conjunctiva, urethra, and epidermis. Nasopharyngeal lesions are frequently multilobed and less vascular. In these cases, nasal obstruction is a prominent symptom. rhinorrhea and epistaxis are frequent symptoms associated with nasal and pharyngeal infections, respectively.[11,13] Irritation of the conjunctiva, conjunctival drainage, photophobia, and pruritus are the most conspicuous symptoms of ocular Rhinosporidiosis.[10,14] Our experiences are comparable. Anomalies identified in our study were warty growths on the pharynx, lips, urethra, anosmia, and nasal infections with abscess formation were among the symptoms.

In our series, routine hematological examinations failed to detect any noteworthy abnormalities. In most instances, normal TLC was observed. TLC showed increase in eosinophil count. Additional employees have also documented comparable experiences.[4,12-14] As previously reported by researchers, an ABO blood group study revealed that 46% of the cases belonged to blood group O, with group AB following closely behind at 24%.[15]

The characteristic polypoid morphology exhibited by Rhinosporidial lesions frequently aids in an accurate preoperative diagnosis. However, atypical presentations may lead to confusion when compared with papillomas or soft tissue tumors. Thus, aspiration cytology may prove beneficial.[15] Additionally, materials may be obtained by scraping lesions that are only superficially visible. The diagnosis is definitively established through the observation of endospores measuring 5-10 µm and sporangium ranging from 50-1000 □m in the cytological smears.[7,14]

Seventeen cases were initially assessed using cytology, which involved either aspiration alone or a combination of aspiration and scrape cytology. Every instance involved an accurate diagnosis of Rhinosporidiosis, which was subsequently validated by histopathology. Endospores are frequently difficult to distinguish from epithelial cells at the respiratory site, especially the nasopharynx. A study[14] describes residual mucoid sporangial material surrounding the endospores as a "comet" form; this can lead to confusion when combined with the epithelial cells' residual cytoplasm and large nuclei. PAS staining is particularly advantageous in this configuration because of the positive staining of endospores relative to the negative staining of epithelial cells.[15]

The definitive diagnosis of Rhinosporidiosis is contingent on biopsied or resected tissue identification of the pathogen at various stages.[15] Multiple sporangia in diverse phases of development are visible in histopathological sections and are surrounded by a thin chitinous wall.[16]

Endospores and sporangia with thick walls exhibit positive staining responses to a range of special stains, including Grocott's stain, PAS, mucicarmine (which was used in our research), and Gomori's methenamine-silve.[8,15,17] Mucicarmine staining is especially useful for distinguishing Coccidioides immitis from other organisms because its sporangia and spores do not stain positively. Cytopathological and histopathological assessments may lead to confusion between occult mycotic lesions and Rhinosporidiosis because of the similar mature phases characterized by substantial thick-walled

spherical formations that harbor endospores. H&E staining can also be used to differentiate between the two species, as the intra-sporangial endospores of R. seeberi are significantly larger and more numerous than those of C. immitis.[15]

Histopathology may be incapable of diagnosing Rhinosporidiosis. Inappropriate selection of portions of polyps containing minimal or no Rhinosporidial tissue, while other portions contain Rhinosporidial bodies, absence of a well-developed bilamellar thick wall of sporangia, presence of only fragments of the outer wall devoid of endospores, and absence of typical Rhinosporidial bodies due to potential immune reactions are all factors that contribute to false-negative diagnoses.[17]

Most Rhinosporidial lesion treatments involve surgery. Complete excision of the lesion via electrocautery is the recommended course of treatment. Recurrence may occur because of endospore leakage into the adjacent mucosa during removal.[15] Dapsone is the only medication with anti-Rhinosporidal properties; however, its application is limited to adjuvant therapy.[18]

CONCLUSION

Our study underscores the importance of prompt diagnosis and treatment of rhinosporodiosis using histology and cytology in a tertiary care setting. Future research should explore the long-term effects of this treatment and its potential impact on an individual's quality of life.

Conflict of interest: No conflict of interest exists among the present study authors.

REFERENCES

1. Chandran M, Mehta R, Nagarkar NM, Bhargava A, Mohapatra E, Pati SK. Rhinosporidiosis-Epidemiological, Clinicoradiological, Immunological Profile. Iranian Journal of Otorhinolaryngology. 2023 Sep;35(130):255.
2. Srinivasan A, Vallandaramam P, Sivaramakrishnan M. Rigid Bronchoscopic Management of Tracheobronchial Rhinosporidiosis Report of 5 Cases and Systematic Review of Literature. Journal of Bronchology and Interventional Pulmonology. 2024 Jan 1;31(1):98-104.
3. Sykes JE. Rhinosporidiosis. InGreene's Infectious Diseases of the Dog and Cat 2021 Jan 1 (pp. 1135-1138). WB Saunders.
4. Swain SK. Human Rhinosporidiosis: still an elusive disease. Int J Otorhinolaryngol Head Neck Surg. 2020 Aug 25;6:174-7.
5. Varghese L, Kurien R, Susheel S, Cherian LM, Rebekah G, Rupa V. Rhinosporidiosis—Factors predicting disease recurrence. Mycoses. 2021 Dec;64(12):1471-9.
6. Gupta RK, Singh BP, Singh BR. Rhinosporidiosis in Central India: a cross-sectional study from a tertiary care hospital in Chhattisgarh. Tropical Parasitology. 2020 Jul 1;10(2):120-3.
7. Santosh BS, Kumar AH, Singh R, Jose J, Shivamrthy DM, Daniel D. A rare presentation of Rhinosporidiosis on buccal mucosa− a case report. Journal of Oral Medicine and Oral Surgery. 2022;28(1):5.
8. Pradhan P, Samal S. Rhinosporidiosis of the lacrimal sac masquerading as chronic dacryocystitis: a rare presentation. Autopsy and Case Reports. 2021 Jan 20;11:e2020214.
9. Giri AK, Padhan S, Galhotra A. Epidemiology of Rhinosporidiosis. InRhinosporidiosis 2022 Mar 12 (pp. 7-16). Singapore: Springer Singapore.
10. ADHIKARI A, DUTTA J, DAS S, BARUA N, CHAKRABORTI C, CHAKRABORTI PB. Ocular Rhinosporidiosis and Recurrence Postsurgery: A Case Series. Journal of Clinical & Diagnostic Research. 2022 Jan 1;16(1).
11. Sen S, Agrawal W, Das S, Nayak PS. Disseminated cutaneous Rhinosporidiosis: Revisited. Indian Journal of Dermatology. 2020 May 1;65(3):204-7.
12. Nagarkar NM, Mehta R, editors. Rhinosporidiosis. Springer Nature; 2022 Mar 11.
13. Nayak S, Pandey S. Unusual Presentations of Disseminated Cutaneous Rhinosporidiosis Masquerading as Tumour Like Lesions of Skin: A Clinicopathological Study. National Journal of Laboratory Medicine. 2021.
14. Ulzen-Appiah K, Imbeah EG, Brookman SB, Akakpo PK. A Rare Case Of Conjunctival Rhinosporidiosis Mimicking A Neoplasm In Ghana. Postgraduate Medical Journal of Ghana. 2022 Dec 29;11(2):127-31.
15. Arseculeratne SN. Recent advances in Rhinosporidiosis and Rhinosporidium seeberi. Indian journal of medical microbiology. 2002 Jul 1;20(3):119-31.
16. Weller CV, Riker AD. Rhinosporidium seeberi: Pathological histology and report of the third case from the United States. The American Journal of Pathology. 1930 Nov;6(6):721.
17. Singh VK, Bhattacharya R, Jaiprakash P, Shivamurthy A. Clinicopathological features of extranasal Rhinosporidiosis: Pitfalls and differential diagnosis. Journal of Datta Meghe Institute of Medical Sciences University. 2021 Apr 1;16(2):261-5.
18. Arias AF, Romero SD, Garcés CG. Case report: Rhinosporidiosis literature review. The American Journal of Tropical Medicine and Hygiene. 2021 Feb;104(2):708.