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ORIGINAL RESEARCH

A clinical study on the safety and efficacy of treatment of nasal Rhinosporidiosis between conventional excision of mass with base cautery as compared to cautery excision of mass and application of hydrogen peroxide inside the nasal cavity

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ABSTRACT

Aims: To compare recurrence rates if 2 methods of Rhinosporidiosis excision in early lesions of the nasal cavity. **Materials and methods:** Over the period of 1 year, 30 patients who presented with rhinosporidial masses in the nasal cavity were selected. The patients were then randomly divided into 2 groups. One group got the conventional treatment of excision of the mass follower by cautery of the base of the lesion, while in the second group, the lesion was first completely cauterised, and then removed from the base. After removal from the base, the second group additionally had 3% hydrogen peroxide applied to the base of the mass and in the nasal cavity near the regions where the lesion had been present. **Results:** Of the patients in the first group who underwent the conventional treatment, 2 returned with recurrence after a period of 7-8 months, despite strict advice regarding lifestyle modification. The patients did not have any history of pond bathing after their first surgery. None of the patient in the second group had any recurrence. The difference between the 2 groups had no statistical significance in terms of their recurrence. The *t*-value was 1.4676, while the *p*-value was 0.076679. The result was not significant at $p < 0.05$. **Conclusion:** Our observation shows that there may be marginally improved outcomes in patient who undergo cautery of the rhinosporidial mass followed by excision and application of topical hydrogen peroxide, when compared to the conventional technique of excision followed by base cautery. This may be due to either spore inactivation or due to lesser spillage since the entire lesion is being cauterised. Further studies, as outlined in our limitations, should be done to establish the same.

Keywords: Rhinosporidiosis; Excision; Cautery; Hydrogen peroxide

INTRODUCTION

Rhinosporidiosis is a chronic granulomatous disease caused by *Rhinosporidiumseeberi*which has a confusing historical taxonomy spanning fungi, parasite and bacteria eventually classified as an Aquatic Eukaryote in 1900 by Seeberi in Argentina. Although the disease has been reportedworldwide, it is mainly endemic in Tropical and Subtropical countries. Most of the cases come from India, Sri Lanka and Pakistan though cases have been reported

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from Africa (Kenya, Tanzania, Rwanda, Burkina Faso, Chad and Egypt), South America (Argentina, Brazil), North America, Europe and Canada. No case is reported from Australia. Recurrence is a common problem in Rhinosporidiosis. In this study we tried to find the effectiveness of a new technique to prevent the most common problem in Rhinosporidiosisi.e recurrence. The aim of this work was to compare the efficacy and safety of a new technique where we are cauterizing the whole of Rhinosporidial mass followed by removal of mass by cauterization of the attachment and local application of hydrogen peroxide with conventional management i.e. removal of the mass by cauterization of the attachment.

METHODS

Over the period of 1 year, 30 patients who presented with rhinosporidial masses in the nasal cavity were selected. All the patients underwent a CT scan of the nose and paranasal sinuses to be certain that the lesion was confined only to the nasal cavity and not in the paranasal sinuses. The patients were then randomly divided into 2 groups. One group got the conventional treatment of excision of the mass follower by cautery of the base of the lesion, while in the second group, the lesion was fir completely cauterised, and then removed from the base. After removal from the base, the second group additionally had 3% hydrogen peroxide applied to the base of the mass and in the nasal cavity near the regions where the lesion had been present. All the cases were done under general anaesthesia with a throat pack and an additional nasopharyngeal pack placed near the choana to prevent trickling down, aspiration or swallowing of the peroxide.

RESULTS

Of the patients in the first group who underwent the conventional treatment, 2 returned with recurrence after a period of 7-8 months, despite strict advice regarding lifestyle modification. The patients did not have any history of pond bathing after their first surgery. None of the patient in the second group had any recurrence.

The difference between the 2 groups had no statistical significance in terms of their recurrence. The *t*-value was 1.4676, while the *p*-value was 0.076679. The result was not significant at $p < 0.05$.

DISCUSSION

Rhinosporidiosis was first described in Argentina over a 100 years ago. It is a chronic pathology, associated with recurrences and dissemination from the initial foci of infection. It has been reported in around 70 countries, with the highest being in Sri Lanka and India. [1]

It is endemic in India, with the highest number of cases being reported from Kerala, Tamil Nadu, along with a high incidence in the rural western parts of West Bengal. [2]

Initially it had been regarded as a sporozoan, followed by a protozoan, then as a phycomycete. Then molecular analysis of the ribosomal DNA by Herr et al, caused the organism to be segregated into a new clade named Mesomycetozoa, which includes fish and amphibian pathogens in the DRIP clade. Hence it is not a classic fungus, but the first known human pathogen from the DRIP clade, a novel clade of aquatic protistan parasites.

Although it is an infective condition, no transmission has ever been documented between members of the same family, or animal to human. Hence it is more apt to call it an infective condition, rather than infectious. Most of the cases are of sporadic nature.

The presumed mode of infection is through traumatised epithelium, most commonly in the nasal region. The traditional mode of treatment remains total excision of the lesion, with cauterisation of the base. [1,3]

Recurrences are commonly seen, at rates between 10-70%, with the cause being attributed to incomplete removal due to excessive bleeding or autoinoculation by iatrogenic trauma. Hence the surrounding tissue should be minimally handled.

Dapsone has been used by authors to prevent recurrences, with 100mg being given once or twice daily for 6 months, and has shown to cause increased degeneration of the organism within 6 months of initiation of treatment, and reduce recurrence. On the flip side, it may cause derangements in liver function tests, while also the issue of patient compliance and repeated follow ups may tend to get cumbersome for the patient, especially if they hail from a rural background. [2,4]

Hydrogen Peroxide has also been shown to have biocide properties, with low degrees of evidence showing that it has been shown to protect from COVID-19 when used as a mouth rinse (1%) solution and as nasal drops (0.5%) solution, when applied for one minute. [5,6]

Concerns about the deleterious effects of hydrogen peroxide on mucosa have been previously studied. On rat mucosa, peroxide caused tissue injury only when the concentration reached 30%, which healed within 1 week. [7]

Moreover, 3% hydrogen peroxide on injured and operated mucosa has been used commonly without any adverse reaction in ENT practice, in cases such as tonsillectomy, as haemostatic agent to prevent bleeding from the tonsillar bed and fossa. Hence the injury caused when 3% peroxide is applied on raw mucosa is next to nil. [8-10]

Arseculeratne et al had tested the effects of a group of biocides [3-6% hydrogen peroxide, 2% aqueous glutaraldehyde, 2.5% chloroxylenol, 2% chlorhexidine, 2% chlorhexidine gluconate 1.5% + cetrimide 15% w/v - 4% isopropyl alcohol, 0.5% cetyl trimethylammonium bromide (Cetrimide), 1% sodium ethylmercurithiosalicylate (merthiolate, thimerosal), 70% ethanol, 1% iodine in 70% ethanol, 1% formalin

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and 10% formalin, povidone-iodine (10%, available iodine 1%) diluted in PBS and 1% silver nitrate in distilled water] on Rhinosporidium in vitro. The viability of the endospores had been checked using 2 dyes: Evan blue was used to check the staining of the endospores cytoplasm and electron dense body as a function of its morphological integrity, while MTT (3-[4, 5-dimethylthiazol-2yl]-2, 5-diphenyl tetrazolium bromide) was used to check the metabolic activity of the spores as the reduction of MTT is dependent of enzymatic activity. After treating the Endospores to 3-6% Peroxide for 36 hours in vitro, the Evan Blue dye showed take up in the cytoplasm and electron dense bodies of the endospores, while neither had any take up with MTT. Hence the endospores effectively had no metabolic activity. [11]

As the spores cannot be cultured, this above study becomes all the more important, as serial testing of the endospores with dye take up forms the only other definitive evidence of the presence or absence of viable spores, along with histopathological examination of the infected mucosa, and formed the basis for our study.

CONCLUSION

Our observation shows that there may be marginally improved outcomes in patient who undergo cautery of the rhinosporidial mass followed by excision and application of topical hydrogen peroxide, when compared to the conventional technique of excision followed by base cautery. This may be due to either spore inactivation or due to lesser spillage since the entire lesion is being cauterised. Further studies, as outlined in our limitations, should be done to establish the same.

Limitations

1. This study does not provide any conclusive evidence for that hydrogen peroxide does fully protect against recurrence in Rhinosporidiosis. This is only a clinical observation
2. Conclusive evidence can be seen either by serial histopathological examination of the affected mucosa, or by dye uptake in the rhinosporidium spores.
3. The study should be repeated with higher sample size over a longer duration of time, in conjunction with either the department of microbiology or pathology with serial testing to definitive evidence of nil recurrence.

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