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Medical therapy of rhinosporidiosis with dapsone

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Abstract
Clinical, histopathological and ultrastructural studies in three cases of rhinosporidiosis show complete remission of infection within one year of therapy with dapsone. Light and electron microscope studies confirmed arrest of the maturation of the spores and accentuated granulomatous response with fibrosis following dapsone therapy.

Key words: Rhinosporidiosis; Dapsone; Electron microscopy

Introduction

Rhinosporidiosis, endemic in India and Sri Lanka, is treated with surgical excision and recurs frequently necessitating repeated excisions (Kameswaran, 1975). Impressed with the similarities in tissue response between rhinosporidiosis and leprosy, the failure to culture *in vitro* both *Mycobacterium leprae* and *Rhinosporidium seeberi* and the fungicidal effects of diaminodiphenyl-sulphone (dapsone), we have used dapsone as a medical therapy for rhinosporidiosis. We report here the clinical course and sequential histological changes in three patients with rhinosporidiosis treated with dapsone for one year.

Materials and methods

Biopsies were taken at the time of presentation. The patients were given dapsone, 100 mg once daily orally, for a period of one year. They were reviewed at intervals of six weeks, 18 weeks and 36 weeks, at which points biopsies were repeated.

For light microscopy, the biopsies were fixed in 10 per cent formalin, and processed routinely. For electron microscopy, additional pieces were fixed in 3 per cent glutaraldehyde, post-fixed in osmium tetroxide, stained with lead citrate and uranyl acetate, processed, and examined with a Philips EM 201C electron microscope.

Results

Clinical details of the three patients studied are given in Table I. A reduction in size of the lesion could be seen after six weeks of therapy. Progressive reduction continued up to 36 weeks of therapy and by one year the lesions were no longer visible (Table I).

Histopathology

Light microscopy of the initial biopsies showed many proliferating organisms with the mature ones liberating spores into the surrounding tissue. Interstitial tissue showed acute inflammatory response in all cases (Figure 1a) with a granulomatous reaction in Case 1.

Electron microscopy showed the varying stages of development of the organism from trophocyte to mature sporangia with many sporoblasts (Figure 1b). The tissue response to therapy is given in Table II.

After six weeks of therapy no definite change could be made out in the organism though there was reduction in the acute inflammatory response. After 18 weeks, many organisms showed degenerative changes and there was a prominent granulomatous response in the tissue (Figure 2a). Viewed under the electron microscope the sporangia showed lack of mature sporulating forms (Figure 2b).

After 36 weeks the organisms appeared much smaller in size and less in number when viewed under the light microscope. Most organisms appeared empty with collapsed or hyalinized walls being engulfed by macrophages. Electron microscopy showed that the totally empty sporangia with collapsed walls were phagocytosed by macrophages.

Discussion

In rhinosporidiosis, after dapsone therapy, the changes observed suggest maturation arrest of the sporangia with an acceleration of the degenerative changes. The non-dividing degenerating sporangia are removed by an accentuated granulomatous response seen by light and electron microscopy. Dapsone acts on the lepra bacillus too by inhibiting growth (Bowman and Raud, 1980) rather than by a bactericidal action.

Sequential light and electron microscopical changes in rhinosporidiosis after dapsone therapy are described for the first time. This study also shows that medical therapy

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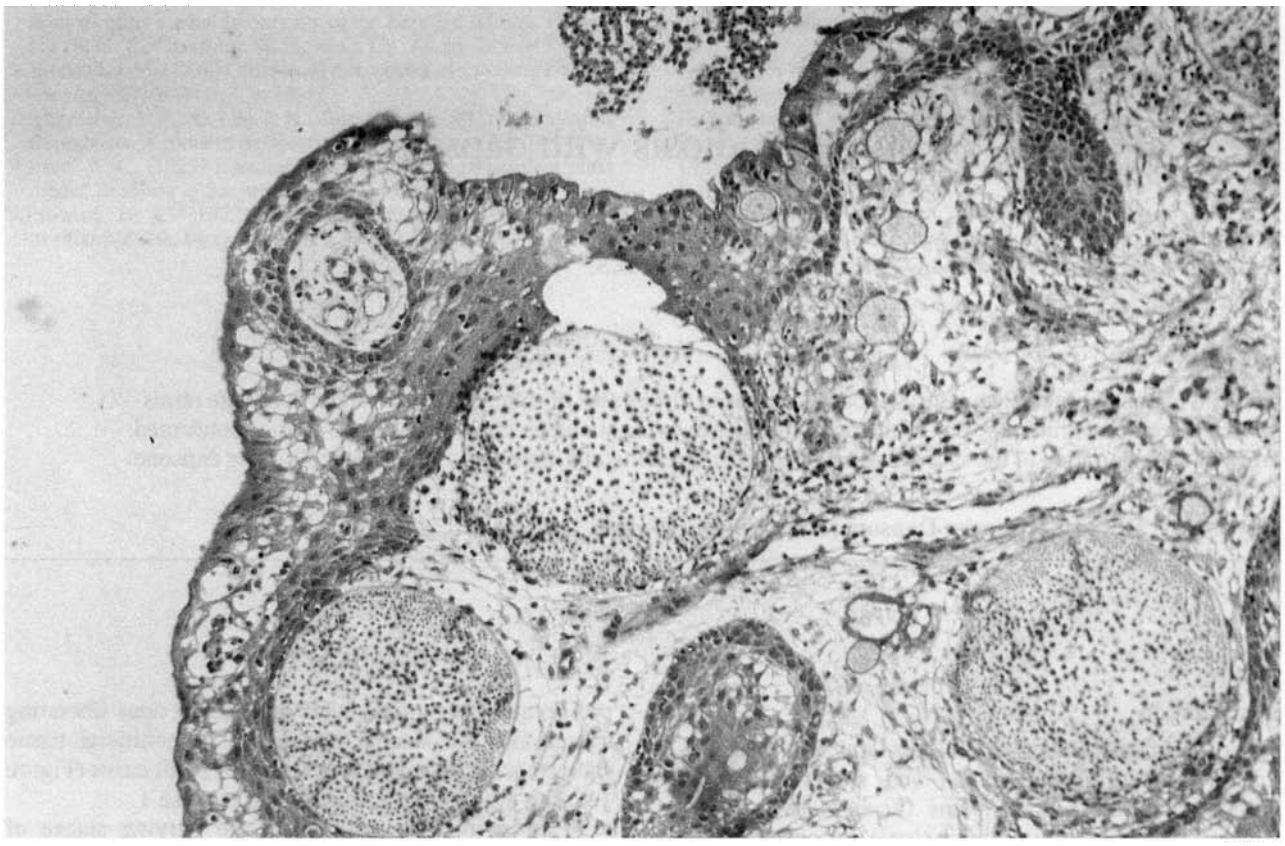

FIG. 1a

Photomicrograph from initial biopsy showing organisms of varying sizes and maturation. The fully mature forms have many spores inside. (H&E; ×170).

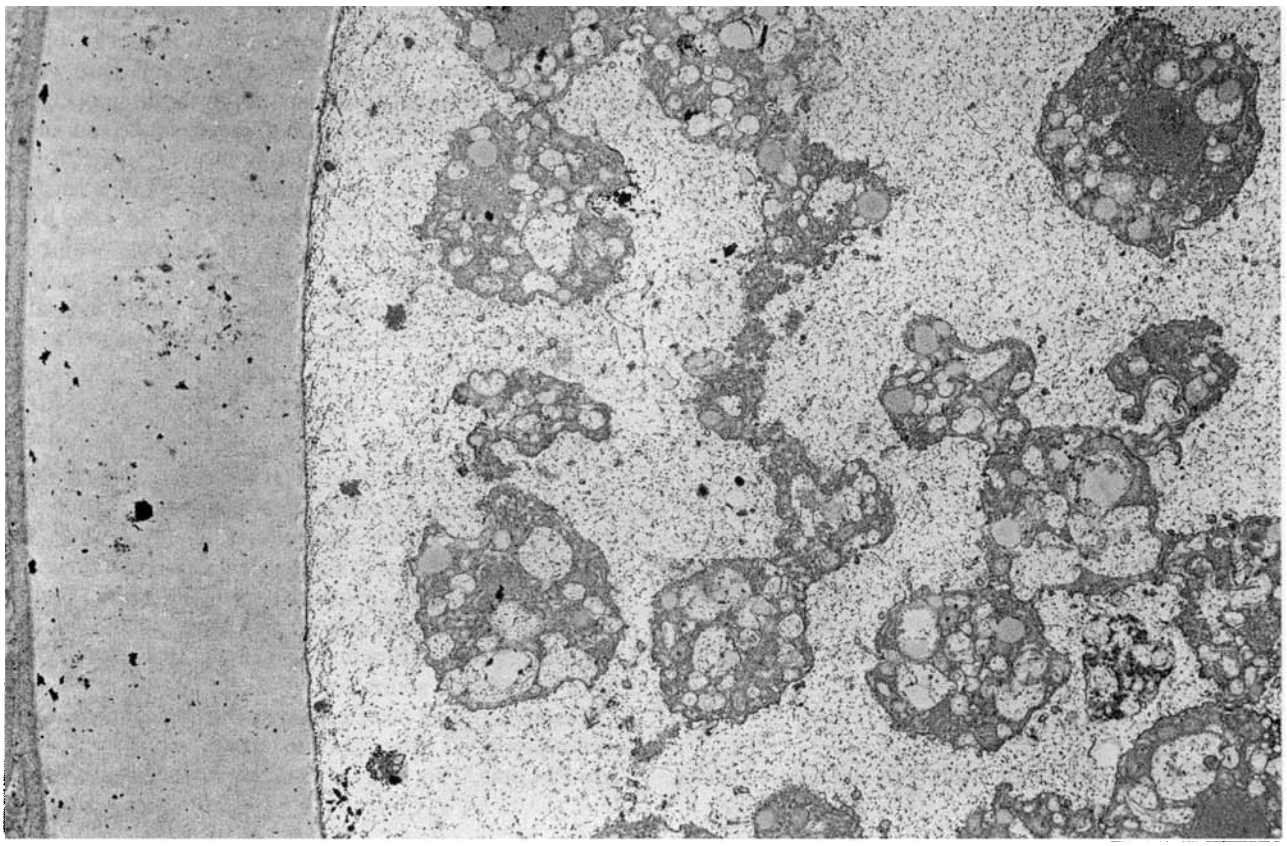

FIG. 1b

Electronmicrograph of a mature sporangium showing the sporoblasts. (×5600).

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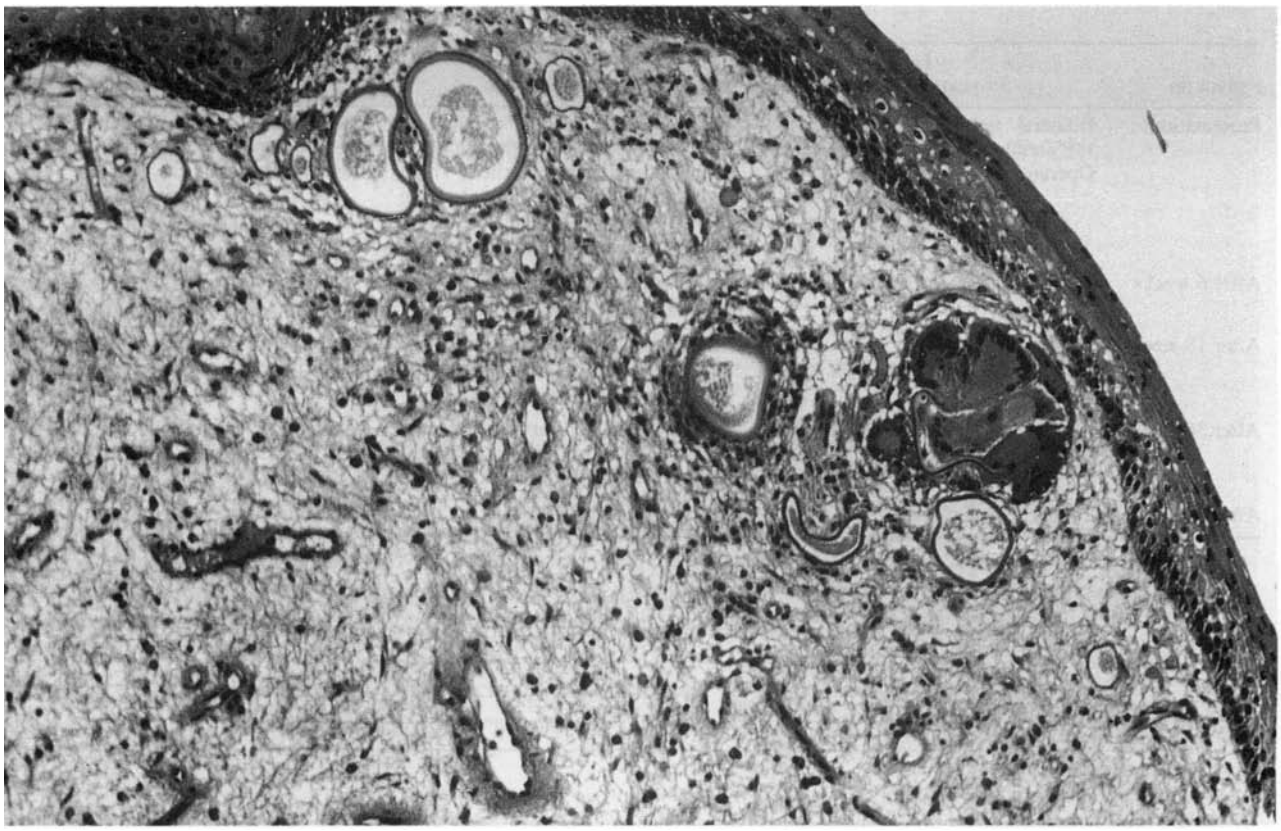

FIG. 2a

Photomicrograph after treatment (18 weeks) showing prominent granulomatous reaction adjacent to degenerated sporangia. (H&E; ×170).

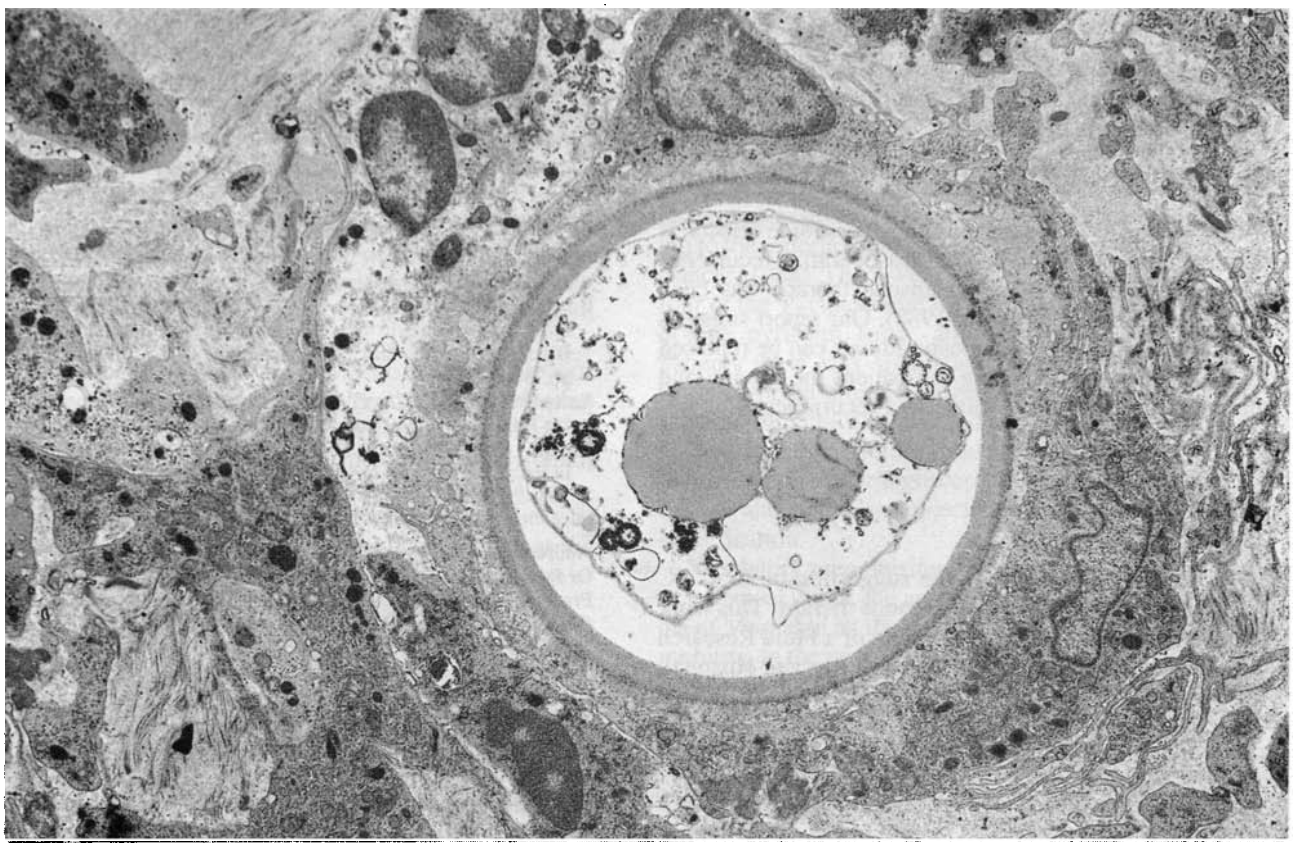

FIG. 2b

Electron micrograph from a granulomatous area showing degenerated sporangium with lack of cytoplasmic material and sporoblasts, engulfed by a macrophage. (×9600).

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TABLE I

Patient no.	1 35-years-old/male	2 28-years-old/male	3 27-years-old/female
Presentation	Bilateral nasal, choanal, lacrymal sac, conjuctival subcutaneous on face Operated upon 13 times	Both eyelids, angle of mouth, anterior chest wall and thigh. (Nasal lesions operated upon earlier.) Thigh and anterior chest wall (single large lesion with multiple small satellite lesions)	Floor of nose and nasal cavity right side, extending to nasopharynx and hanging into oropharynx
After 6 weeks	All lesions reduced by one third	Satellite lesions disappeared. Other lesions smaller	Lesion no longer visible orally. Nasal and nasopharyngeal lesion looking pale
After 18 weeks	Minimal lesions in nose. Skin, conjunctival and lacrymal sac lesions markedly reduced	Chest and skin lesions markedly reduced	Nasal lesion reduced. Nasopharyngeal lesions disappeared
After 36 weeks	Minimal lesions in nose, rest have disappeared	All lesions have disappeared except on left eyelid which was excised due to secondary infection	Minimal lesions in the floor of right nose
After 1 year	Totally free of disease	Totally free of disease	Totally free of disease

TABLE II

CHANGES OBSERVED BY LIGHT AND ELECTRON MICROSCOPY

	Case 1 Biopsies			Case 2 Biopsies			Case 3 Biopsies		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Light microscopy									
Viable sporangia	++	+	–	+++	+	–	++	–	–
Degenerate sporangia	–	++	–	+	++	++	+	++	++
Acute inflammatory response	++	+	–	+	–	–	++	+	–
Chronic inflammatory response	+	++	+	+	++	++	+	++	+
Granulomatous response	+	++	–	++	+	+	–	–	+
Electron microscopy									
Cytoplasmic material	++	+	–	++	++	+	++	++	+
Sporoblasts	++	–	–	++	+	–	+	–	–
Empty sporangia	–	++	+	–	++	++	+	++	++
Collapsed sporangia	+	++	+	–	++	++	–	++	++
Macrophages with collapsed sporangia	–	++	+	++	++	++	–	–	+

with this drug alone, which has no adverse side effects, is curative. Recently reduction in post-operative recurrence rates in rhinosporidiosis on dapsone therapy has been reported (Nair, 1979; Bhanu, 1980). Our report suggests that surgical excision in rhinosporidiosis can be replaced by dapsone therapy, sparing the patient the trauma and morbidity of surgery and anxiety of recurrence.

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