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The occurrence of leprosy in an eight-member family—a case report

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Summary A family of 6 children aged between 11 years and 11 months and their parents affected with leprosy is reported. The mother and 5 children had multibacillary leprosy and one child had paucibacillary leprosy. The father, though apparently clinically normal, showed acid-fast bacilli in the skin. This family illustrates that the incubation period of leprosy can be shorter than 1 year and the possibility that this may be related, in some cases, to intra-uterine transmission is discussed.

Leprosy is known to occur in more than one member of a family, but it is unusual to see all 6 children and both parents affected by leprosy at the same time. This paper describes the clinical, bacteriological and histopathological findings in such a family.

Case reports

1 *AL card no. SJO 7346, a female child born in 1974*, hailing from Ambo, Shoa Region, was brought to ALERT hospital on 21 August 1981 with multiple shiny nodules all over the face, ears, limbs and buttocks of 2 years' duration. The lesions increased 4 months before admission. The trunk was free of lesions.

There was no thickening of nerves or anaesthesia. A diagnosis of lepromatous leprosy of the histoid type was made. Skin smears revealed a Bacteriological Index (BI) of 4·8 and a Morphological Index (MI) of 7·8. The child was admitted and a course of rifampicin 300 mg daily for 3 weeks and dapsone (DDS) 100 mg in his neighbourhood. His present wife, who is the mother of all the children in this report, was his third. He had had children by his first and second marriages, but no medical details were available. The child described above was the third child of the third wife and he was asked to bring the others for examination, daily was given.

2 *The father accompanying the child* was examined and found to have no clinical evidence of leprosy. He was unaware of any other cases of leprosy in the family or

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together with the wife. On a subsequent attendance, he himself was re-examined and again found to be free of clinical signs, but to have a positive smear for acid-fast bacilli (AFB) at one site, namely the forehead, where the BI was 2+; it was negative at other routine sites. This positive finding was checked carefully and confirmed, and in view of the circumstances, he was treated with DDS 100 mg daily.

3 *BL card no. SJO 7475, a 10-year-old female child*, the second child of the family, had multiple erythematous and oedematous papules and plaques on the face, limbs and buttock of 3 months' duration. There was no nerve thickening or anaesthesia. A diagnosis of borderline lepromatous leprosy in reaction was made. Smears showed BI 2·5 (maximum 4) and MI 2. A skin biopsy showed that the epidermis was spongiotic, with oedema of the dermis. Below the epidermis there was a narrow free zone without any infiltrate. Below that there was a diffuse infiltrate of histiocytes, together with a few epithelioid cells and lymphocytes. AFB 3+. Conclusion: BL leprosy in reaction. The lepromin test was negative. The child was treated with rifampicin 600 mg daily for 3 weeks and DDS 100 mg daily. She was also given chloroqine for 2 weeks. The erythema and oedema subsided.

4 *DL card no. SJO 7474, a boy aged 3 years*, the fifth child of the family, was also brought on 17 February 1982 with multiple papules and plaques on the face and limbs and hypopigmented macules on the trunk of three months' duration. The lesions were fewer than in case no. 3. A diagnosis of BL leprosy was made and smear examination showed BI 2 (maximum 3). Skin biopsy showed that in the upper dermis there was a band-like infiltrate of macrophages and lymphocytes. AFB 3 to 4+. Conclusion: BL leprosy. Lepromin test was negative. The child was given rifampicin 300 mg daily for 3 weeks and DDS 50 mg daily.

5 *CL, 43-year-old female, the mother of the children, card no. SJO 7476*, had a few ill-defined hypopigmented macules on the arms, thigh and left leg. The BI was 3 (maximum 4). Biopsy showed multiple small collections of macrophages and few lymphocytes in the upper dermis. AFB 5+. Lepromin test was negative. BL leprosy was diagnosed. She was also given rifampicin 600 mg daily and DDS 100 mg daily.

6 *JL card no. SJO 7482, the youngest child in the family*, an 11-month-old boy. There were 7 small, slightly raised lesions varying from 5 to 10 mm in size on the trunk, thigh and ankle. Smears were taken from 3 of these lesions and the average BI was 3+. A biopsy of one of the lesions showed an infiltrate in the upper and mid-dermis composed of histiocytes, macrophages holding AFB, many lymphocytes and few epithelioid cells. AFB 3 to 4+, including solids. Conclusion: BL leprosy. Lepromin test was negative. The child was given rifampicin 150 mg daily for 3 weeks and DDS 25 mg daily. Considerable care was taken to assess and record this child's age as accurately as possible. Our enquiries, and the physical size and appearance, strongly suggested an age of 11 months.

7 *TML card no. SJO 7509, an 11-year-old boy*, the eldest child of the family, had

several hypopigmented macules distributed asymmetrically on the limbs and buttock. Smears showed BI 4+ and MI 3+. Biopsy revealed an infiltrate of histiocytes with a few epithelioid cells, and lymphocytes. AFB 4+. Conclusion: BL leprosy. Lepromin test was negative. The child was given rifampicin 600 mg daily for 3 weeks and DDS 100 mg daily.

8 *AL card no. SJO 7510, a 7-year-old boy*, the fourth child in the family, was also examined. He had multiple, small hypopigmented, slightly raised, oval well-defined lesions on the trunk, buttock and limbs distributed asymmetrically. Smears were negative. Biopsy revealed multiple localized collections of epithelioid cells with numerous Langhans giant cells and lymphocytes. No AFB. Conclusion: BT leprosy. Lepromin test was positive (induration 8 mm). This child was also given rifampicin 300 mg daily for 3 weeks and DDS 50 mg daily.

Discussion

In this family the mother and all the 6 children have leprosy. Out of these, only one child has paucibacillary leprosy and all the others have multibacillary leprosy. The father, though apparently clinically normal, has BI 2+ at one site. Thus all the children and probably both parents are affected with leprosy. The oldest child was 11 years and the youngest was 11 months when the disease was detected. In this family it is difficult to say who got the infection first, but the mother might have been the source of infection as her lesions were vague and difficult to detect and the skin smears were positive. Since the age difference between the children is small, they are closely associated in the family environment and the infection might have spread easily from one to the other. However, it is very unusual to find all children in one family affected with the disease. It is well known to leprologists that the leprosy bacillus does not produce the disease in all human beings with whom it comes in contact. A variety of factors have been identified to explain this supposed variation in susceptibility. These include diet, climate and incidence of other infections and other factors described as innate, inborn, constitutional, familial or hereditary.[1,2] Heredity may play an important role in the aetiopathogenesis of leprosy. Available data on the genetic factors in leprosy are still conflicting and inconclusive.[3] De Vries *et al.*[4] showed that siblings with the same type of leprosy show a significant excess of identical HLA haplotypes. Genetic studies of this family will be reported separately.

It is noteworthy that most of the cases in this family were detected by 'active' clinical examination; neither the patients nor the parents having complained about the disease. The asymptomatic hypopigmented macules were obviously not considered as an indication of leprosy (or any other disease)—a matter of particular concern, since such cases may of course be a great source of infection in the community.

In view of the finding of a positive slit skin smear at one site in the father, together with the extremely heavy family involvement, it was considered wise to

regard his as a case of leprosy and to treat with DDS. Although normal clinically, one must bear in mind the possibility that leprosy bacilli can enter the skin without producing any visible sign of the disease. Ghosh[6] reported 12 contacts showing histological changes in the dermis, including nerves containing AFB, but without any visible signs of leprosy. It is not sure whether the father is in the incubation period of the disease, or whether his immunity, aided by chemotherapy, will cope with the challenge. He remains under close clinical observation.

Almost certainly, the most interesting case in this family was the child who was 11 months old on diagnosis. Although the average incubation period is accepted as being from 2 to 5 years, it may vary from 3 months to 40 years.[7] There are very few documented cases of leprosy under the age of 1 year except those reported by Chakrabarthi[8] but the whole subject is of great current interest in view of the possibility that leprosy may, in some instances, be transmitted by the placental route. Melsom *et al.*[9] have described immunological findings which point to intra-uterine infection in leprosy, and more recently Duncan *et al.*[10] have reported the clinical and immunological findings in 4 babies of mothers with lepromatous leprosy, 2 of whom developed leprosy in infancy. Lesions were first observed at the age of 12 and 17 months respectively.

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