

## **Multibacillary leprosy in an 18-month-old child: a case report**

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*Summary* A case of multibacillary leprosy, proven on slit-skin smears and skin biopsy, is reported in a child aged 18 months in Ethiopia. The father and 2 other children were not available for examination, but the mother was a registered case of mid-borderline (BB) leprosy of 5 years' duration. The clinical, bacteriological and histopathological findings are described and discussed in relation to the accepted incubation period of leprosy and the possibility of intra-uterine infection.

### **Introduction**

In practice, leprosy cases in children below 2 years of age are exceedingly rare.<sup>1</sup> Lepromatous cases are uncommon before puberty, the great majority of cases in children being indeterminate or tuberculoid.<sup>1</sup> The incubation period of leprosy is on average from 2 to 5 years, but in lepromatous (multibacillary) leprosy, there is the possibility of a somewhat longer incubation period.

When lepromatous leprosy is diagnosed with certainty in a child under 2 years of age, as in the case we now report, there is obviously clear evidence for an incubation period shorter than that usually accepted. It is important to report such cases and to consider the possibilities of infection at birth, after birth or even *in utero*.

### **Case report**

*A male Ethiopian child* aged 18 months was presented by his mother for skin lesions which she had noticed for 2 months. The lesions started on the back and spread to other parts of the body. The mother had herself attended the clinic for a skin condition which was diagnosed as borderline leprosy (BB). The duration of



**Figure 1**



**Figure 2**

her disease was 5 years and she denied having received anti-leprosy treatment in the past. The father of the child and 2 other children in the family were not available for examination but were reported to be free from leprosy. There was no history of leprosy in the family.

Apart from the presence of the skin lesions, the child looked quite healthy. He was well nourished, of normal weight and was quite cheerful before he was subjected to the many investigations. He was not anaemic and the liver and spleen were not enlarged. There was no lymphadenopathy. There were many skin lesions present (Figures 1 and 2) consisting of small plaques (raised flat lesions) of variable sizes, mostly under 2 cm in length and looking erythematous, smooth and shiny. They were mostly distributed over the face, forehead, cheeks, upper arms and legs. Apart from a lesion on the left ear, the ears were not infiltrated and

the oral and nasal cavities were free from lesions. There was no madarosis and the eyes were normal. The hands and feet were moist and were free of any ulcers. No thickened nerves could be detected.

#### INVESTIGATIONS

The bacteriological index (BI) showed 2+, 2+, 2+ 1+ and 2+ at right ear, right eyebrow, left ear, left buttock and right thigh. Repeat examination showed 3+, 3+, 3+ and 3+ in smears taken from the most prominent lesions. The morphological index (MI) gave a figure of up to 6 in all 4 smears.

A skin biopsy showed a differing histological infiltrate in the upper, mid and lower zones. The upper zones had a picture resembling BL leprosy on the Ridley–Jopling classification, whilst the lower infiltrate had epithelioid cell foci, surrounded by lymphocytes and with some Langhans giant cells. Bacilli were easily found and the bacteriological index of the granuloma ranged from 2 to 4, with most bacilli-fragmented. The overall picture mainly suggested a downgrading process from BT to BL.

*Lepromin test:* positive 3 mm (Mitsuda).

*Mouse foot-pad inoculations.* A punch biopsy was performed from the lesion on the back, found earlier to yield larger numbers of *Mycobacterium leprae* with a proportion of solid forms (BI 3 and MI 6% at this site). The specimen was homogenized and the *M. leprae* recovered ( $5.2 \times 10^6$  AFB) and counted.<sup>13</sup> The organisms were diluted so as to provide an inoculum of  $5 \times 10^3$  *M. leprae* per foot-pad and 26 locally bred Swiss albino mice were inoculated each in both hind foot-pads. One group of 8 mice served as untreated controls, whereas other groups of 6 mice were fed on a diet into which had been incorporated dapsone in a concentration of 0.0001, 0.001 and 0.01 g per 100 g diet. Harvests of *M. leprae* were performed from both hind foot-pads of 1–2 control mice beginning 6 months after inoculations. At 10 months evidence of multiplication (an average yield of  $7 \times 10^5$  *M. leprae* per foot-pad) was observed in the control mice. On the other hand, the yield of *M. leprae* in any of the harvested 5 mice administered dapsone in a concentration of 0.0001 g per 100 g diet appeared to be fewer than  $1.3 \times 10^4$  organisms. The patient's *M. leprae* were therefore considered to be fully susceptible to dapsone.

The mother was seen for the first time when she brought her child for examination. She gave a history of skin lesions that had been present for 5 years. She also complained of burning sensation all over the body, numbness in the hands and ulcers on the feet. After delivery of the child, the lesions became red and swollen. The swelling disappeared after about 3–3½ months. She had never

received anti-leprosy treatment up to the time when she came to us. On examination, she was found to have many hypopigmented macular skin lesions, mostly on her back. There was no loss of sensation in the lesions on light cotton-wool touch. Both ulnar nerves were thickened. There was partial madarosis. BI=1 (2+, 1+, 0, 1+, 1+ 2+). It is possible, that her leprosy had upgraded after delivery.

## Discussion

No age is exempt from leprosy<sup>2</sup> but, in practice, leprosy cases in children below 2 years of age are exceedingly rare.<sup>1, 3</sup> Two cases of borderline-tuberculoid (BT) leprosy discovered in children aged 18 months have been reported.<sup>4</sup> In surveys,<sup>5</sup> leprosy in the age group 0–1 was found, but in the age group 1–4, 8 cases in Nigeria (Katsina), 2 cases in Cameroon and 1 case in Thailand (Khon Kaen) were found. Lepromatous cases are uncommon before puberty and the great majority of cases in children are indeterminate or tuberculoid<sup>1</sup> Bechelli *et al.*<sup>5</sup> did not find any lepromatous leprosy among the age group 0–4 and no smear-positive case was found in the 4235 pre-school children examined in Bombay.<sup>6</sup> It is stated<sup>7</sup> that for a child born to a woman who has had an active relapse (of leprosy) during pregnancy there is a risk of clinical leprosy in early childhood. This is likely to be of indeterminate type and self-healing, particularly in the very young child and probably occurs more frequently than realized hitherto.

The consensus of opinion is that in most cases the incubation period is about 2–5 years.<sup>8</sup> Immunological investigations have revealed that most of the people exposed to leprosy will show responses suggestive of subclinical infection<sup>9–10</sup> and this can be found within a few weeks of exposure. Intra-uterine infection is not yet proven but immunological studies suggest that this probably takes place.<sup>11–12</sup>

When multibacillary leprosy is, therefore, diagnosed in an 18-month-old child 2 possibilities come to mind; the incubation period was shorter than generally believed to be in multibacillary leprosy or this was the result of an intra-uterine infection.

This case should alert health workers to examine infants of leprosy mothers and to do skin smears in all children with suspicious skin lesions.

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