

JUVENILE LEPROSY

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It is usual to classify leprosy into neural and cutaneous types according to whether the signs are chiefly connected with the nerves or with the skin, these being the two sites in which the disease is most evident. Cases in which the nerves alone are infected are rare, but cases in which the skin alone is affected are even rarer, if they ever exist at all. The terms "neural" and "cutaneous" leprosy must therefore be understood as only comparative terms indicating that the preponderance of clinical signs are connected with the one or other organ.

Leprosy infection is of exceedingly low toxicity; so that a patient may have a very high degree of infection and yet show practically no toxic signs. He may appear strong and healthy and do a strenuous day's work without undue fatigue. The general and local signs of lepra fever, which are so distressing to the patient, are of an allergic rather than a toxic nature. Apart from lepra fever, the ordinary signs and symptoms of leprosy are due chiefly to the local response of cells to bacilli in their neighborhood.

The degree of local cell response varies with the resistance of the body to the infection. If the resistance is low, and the cellular reaction therefore comparatively slight, a state resembling symbiosis is established between *Mycobacterium leprae* and body tissues. The multiplication of cells in response to the bacilli in their neighborhood is diminished, and bacilli remain in the intracellular spaces instead of being ingested by the cells. Those that are ingested multiply inside the cells instead of being phagocytosed and destroyed. The tolerance of the cells for the organisms is even more marked in the nerves than the skin, so that there may be a mild cellular response in the skin while there is practically none in the nerves. Thus in typical cases of skin leprosy, in which there are widespread lepromatous changes in the skin, the corresponding nerves may appear clinically normal but sections may show large masses of bacilli lying

between the nerve fibers with little or no cellular response to their presence.

This total or partial symbiotic effect may be brought about or contributed to by one or more of three factors: (a) the age of the patient, juveniles being particularly tolerant or nonresistant to the infection; (b) debility, from whatever cause; and (c) high concentration of leprosy bacilli in the body. The object of this paper is to describe a type of leprosy which I have termed "juvenile leprosy" and which is due in large measure to the first of these factors, viz., the tolerance of the tissues of the body for *My. leprae* during the first few years of life.

A young child is brought in contact with a highly infectious case of leprosy. On account of his tender age, resistance to the bacillus is low, and infection is therefore able to spread throughout the body undeterred by phagocytic action of the cells and without causing any very marked clinical signs or symptoms. If the child is debilitated general infection will take place all the more readily. In the case of a normal child, as he grows older his resistance to the bacillus tends to increase, but when in early childhood widespread infection has taken place the third factor prevents this increase and resistance accordingly remains low.

Juvenile leprosy is therefore caused by an extensive infection during the bacillus-tolerant early years of life. This extensive infection maintains the low resistance when adult age is reached (see the third tolerance-producing factor).

As might be expected from the above description, the clinical signs of juvenile leprosy are absent, slight or intermittent. The thickening of nerves, anesthesia and other neural symptoms are absent, or at least so slight that they cannot be made out with any certainty. Ill-defined macules are found with keratosis, hypopigmentation (showing best in dark skins) and erythema (showing best in fair skins). The margin is level with and fades away into the surrounding skin. These macules may increase in size, but as they spread at the margin they tend to become more and more ill-defined. They may appear and disappear from time to time. On section a mild degree of cellular increase is found, especially around the sub-papillary plexus; a few bacilli may or may not be found, especially

in that layer of the skin. Considerable experience of these cases is necessary in making a diagnosis, especially if the bacteriological examination is negative, and a history of contact with an infectious case is of great importance. Chiyuto (1) has shown that these indefinite macules of juvenile leprosy often develop into definite leprous lesions of the skin type later on in life, and there is good reason to believe that juvenile leprosy frequently passes undetected until the grosser type supervenes, and that in endemic countries it occurs far more commonly than is supposed.

Juvenile leprosy may appear at a very early age. I have seen a child of 3 months with many macules of this type. After puberty it is uncommon, the infection either clearing up or developing into the frank cutaneous type. The determining factor as to which of these developments will occur is partly the degree of infection, but chiefly the general health of the child.

From the name one might suppose that juvenile leprosy is found commonly in young children. In my experience in India this is far from being the case. The more resistant type is probably equally or even more common, and being more conspicuous it is certainly far more frequently diagnosed. Juvenile leprosy is more commonly seen in homes for the children of leprous parents, and in such institutions it is generally the most common type.

The recognition of juvenile leprosy is of extreme importance. There is good reason to believe that in an endemic area the majority of cases which in future life become infectious, and in turn transmit the disease to the next generation, belong initially to this class. My experience in Northern India shows that the great majority of those infected in adult life either recover or remain as uninfected cases.

The main problem in the control of leprosy is to prevent the infection of young children. In any community where this can be accomplished the disease is likely to become a negligible one within a single generation. The child with juvenile leprosy is a latent source of danger, and the insidiousness of the onset and progress of this type makes it difficult to tell when such a child begins to become a danger to the community. The leprolin test is, in my experience, of great value in diagnosing such cases. Negative tests have not

infrequently led to careful re-examination of such children, with the result that numerous lepra bacilli have been found in the skin or nasal mucosa, although clinical signs were negative or only sufficient on careful inspection to excite suspicion.

As I have indicated above, the prognosis in juvenile leprosy, while it is influenced by the degree of infection, is still more dependent on the general health of the child. Likewise, while hydrocarpus injections in moderate doses are of use, by far the most important consideration in the treatment is the steady maintenance of a high degree of general health.

REFERENCE

- (1) CHIYUTO, Sulpicio.—Early leprotic changes in children and their bearing on the transmission and evolution of the disease. *Mo. Bull. Bu. Health, Manila* 13 (1933) 5-48.