

The Early Diagnosis of Leprosy.

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A STATEMENT in an article entitled "The Curability of Leprosy," by Prof. Marchoux, appearing in the July number of *LEPROSY REVIEW*, has prompted the writing of this paper. After referring to a case of leprosy in which the disease showed apparent spontaneous cure, he says: "Observations of this kind would doubtless become very common if we possessed signs for discovering leprosy in the early stages as easy to demonstrate as those by which we can demonstrate incipient tuberculosis. We should have still more astonishing surprises if we possessed for leprosy a reagent of a sensitivity as great as that of tuberculosis. Without doubt, we should in leprosy areas obtain proportions, if not of 98 per cent., as for Koch's bacillus (for the latter is carried by very subtle means), yet certainly of unsuspected size." So far, all attempts to produce such a test have proved of little use, although many such tests have been put forward. One of the latest, the reaction of Botelho, is described in the *Bulletin de la Societe de Path. Exot.* By means of it, 78 per cent. of nerve, 70 per cent. of skin, and 66 per cent. of mixed cases were found positive.

But if a serological test is to be of any value in the diagnosis of leprosy, it should surely be positive in every case in which the diagnosis can be definitely proved either bacteriologically or clinically. We have tried out this test in Calcutta in early bacteriologically negative but clinically positive cases, and have found it of no practical value in making an early diagnosis.

This goes to show that we must depend for early diagnosis of leprosy on clinical rather than on serological examinations. It should be of interest to Prof. Marchoux and other European workers to know the high proportion of cases only clinically positive as compared with those bacteriologically positive in a highly endemic country like India. Two examples out of many available may be given. At the clinic of the Calcutta School of Tropical Medicine there attended during last year 929 leprosy patients. In only 372 or 39 per cent. was it possible on careful examination to find acid-fast bacilli; in the remaining 557 cases the diagnosis was entirely dependent on clinical evidence, and yet in not a single one of these cases was there any doubt as to the actual presence of leprosy, the symptoms being considered quite definite. Of these 557 cases, 146 had acroteric lesions, showing anæsthesia, deformity and other trophic lesions of the hands and feet. But the remaining 411 were early cases without trophic lesions.

Another still more striking example was the result of the examination of coolie labour in Calcutta. 16,889 cases were examined, and out of these 159 or 0·94 per cent. were found to have definite symptoms of leprosy. The incidence was probably higher as several examinees absented themselves, probably from fear of losing their work if they were found to have leprosy. Out of these cases, thirty-nine were bacteriologically positive, six showed acroteric lesions (A2 type), and 114 or 72 per cent. were early cases diagnosed on clinical evidence only. In some places in northern Bengal the incidence of leprosy has been found to be as high as 6 per cent.

All this goes to confirm the contention of Prof. Marchoux that, as in the case of tuberculosis, the incidence of leprosy infection is far higher than is generally supposed. The frequency with which cases of the A1 type are found among the contacts of highly infectious cases of the B2 and B3 type would lead one to believe that over and above those showing actual clinical signs there are many who are infected, but in whom the resistance is sufficient to prevent the development of the disease to an extent which can be diagnosed either clinically or bacteriologically.

Moreover, in Calcutta, we have abundant evidence that even the slightest infection may persist for many years with scarcely any advance. As an example may be mentioned a patient who had had two circular, anæsthetic patches on his thigh for twenty-two years. On examination he was found to have anæsthesia of the lobe of an ear and a very markedly thickened great auricular nerve. It is not unlikely that in many cases the infection may persist internally for an equally long period without the patient having, as he had in this case, unmistakable clinical evidence of the disease.

We have then two factors, the widespread infection of contacts and the long persistence of infections which are so slight that they cannot be diagnosed or can be recognised only after very careful examination. These two factors provide the presence of the seed ; the important determining factor is the resistance of the body. Any prophylactic or therapeutic measures which are taken to cope with leprosy must aim at :

- (i) Examining for signs of leprosy, especially in contacts with infectious cases.
- (ii) Distinguishing between infectious and non-infectious cases, and taking all possible means to prevent the former from spreading infection.
- (iii) Providing advice and treatment to early cases with a view to preventing them from developing into infectious cases.

Since much depends upon the early clinical and bacteriological diagnosis of leprosy, the common early signs and symptoms may be mentioned here : Leprosy most commonly first appears in the form of one or more patches or macules, annular or circinate in shape. In the dark skins depigmentation is one of the first signs which brings the patient for examination. One or more depigmented patches may appear anywhere on the surface of the skin. The depigmentation is not complete, but the patch is of a lighter colour than the surrounding skin. In lighter skins depigmentation is more difficult to distinguish, but this is made up for by the more easily distinguished erythema. Erythema and raising of the skin surface generally accompany each other, and may either affect the whole patch or, more commonly, only the margin. In early slow-spreading patches the epithelium is generally raised at the margin in the form of reddish papules which coalesce. As the patch spreads a few papules may often be noticed, like scouts, outside the advancing margin. In other cases the raised margin may be absent or difficult to distinguish.

Parakeratosis is another marked feature of early patches. The skin surface becomes coarse and shiny in appearance. Along with this there is anhydrosis, and the hairs first become coarse, and then break off at the mouths of the hair-follicles, leaving a black bulbous head marking the position of the follicle, inside which the hair is curled up.

There is almost always some disturbance of sensation. In the more chronic cases there is epicritic anæsthesia, the patient failing when blind-folded to respond to the touch of a feather on the patch. In more acute cases epicritic sensation is not lost, but deep analgesia is present, pricking with a pin being felt much less on the patch than on the surrounding healthy skin. In the former, acid-fast bacilli cannot be found, but they can be found as a rule in the latter.

The thickened nerve branches supplying the affected skin can often be felt running under the skin before they pierce the deep fascia. Such nerve thickening is characteristic of leprosy, and is useful in confirming the diagnosis in otherwise doubtful cases. When the sensory nerve branches at once pierce the deep fascia on leaving the skin they cannot be felt, but deep percussion on the patch or at a spot immediately proximal to it will often elicit a tingling sensation due to the thickening and consequent tenderness of the nerve.

In other chronic cases there is no definite patch at all, the disease apparently first showing itself as an infection of some nerve trunk, most commonly the ulnar. Following this there is anæsthesia of the most distal parts of the skin supplied by the affected nerve, and frequently in the case of the ulnar there is flexion of the small finger due to the cutting off of the trophic supply to the small muscles of that finger and their consequent wasting and contracture.

The above-mentioned signs are generally sufficient to make a definite clinical diagnosis of leprosy, but there are some patients who come to our clinic with signs which are suspicious, but are not sufficient to make a clear diagnosis. In these cases it is our custom to correct any accompanying disease which would lower the resistance of the patient, such as malaria, pyorrhœa, dietary defects, etc., and to tell the patient to return after three months. In some of these cases the suspicious signs disappear, while in others the signs increase to a point at which a definite diagnosis of leprosy can be made.

The extreme importance of making an early clinical diagnosis may be judged by the fact that almost 100 per cent. of cures may be expected in early cases if they are thoroughly

treated. By *cure* is meant the disappearance of all active signs of the disease. By *permanent* is meant *continuation over a period of years*. It is impossible to say that all the leprosy germs have been eradicated from the body, but then it is equally impossible to say that leprosy germs are absent from the body of anyone who has been in close contact with an infectious case of leprosy, even though no recognisable signs of leprosy have ever appeared. By *active signs* are meant :

- (a) Positive bacteriological findings in skin, mucosa or lymph nodes.
- (b) Appearance of fresh lesions.
- (c) Erythema or raised margin in original patches.
- (d) Keratosis, anhydrosis or depilation in original patches.
- (e) Increase or decrease of the size of a lesion either visibly or as judged by the extent of abnormal sensory signs.
- (f) Thickening or tenderness of nerves.

It must, however, be made clear that leprosy, however limited the extent of the lesions, will often leave certain permanent signs in the form of diminished sensation, anhydrosis, depilation and colour change. But when these have been reduced to a minimum, and no further change is found over a period of, say, six months, I consider that, generally speaking, one is justified in considering as permanent such visual and sensory signs as remain. They do not indicate the presence of infection, but of irreparable destruction of nerve fibres, hair follicles and sweat glands.

A patient in the most advanced stage of leprosy, with most of the skin of his body thickened with the disease and containing in any cubic centimeter of its area billions of Hansen's bacilli, can still remain in apparently good health, and daily carry on work implying an immense amount of physical exertion. This goes far to indicate that the toxicity of leprosy is very low as compared with tuberculosis, and it is therefore not surprising that a reliable test, which would correspond with the tuberculin test in tuberculosis is not available.

Clinically, however, early leprosy can be diagnosed with much more ease and certainty than can tuberculosis of a corresponding stage of advancement. It has been through the overlooking of early clinical signs that the frequency of leprosy in endemic areas has not been recognised, and that the method here advocated of dealing with leprosy by treating such early cases has so long been neglected.