

## PREVENTION OF LEPROSY

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### Summary

Leprosy evolves over a long period and after the time of contact it takes long time before pathological changes become evident. Prevention may be achieved by increasing the level of detection and controlling the risk factors.

In this paper, the methods of prevention of leprosy are described. Primary prevention, or prophylaxis is of prime importance and this can be achieved by reducing an individual's susceptibility as well as by reducing his/her exposure to susceptible individuals. The former needs general health promotion, immunoprophylaxis and chemoprophylaxis. The latter is achieved by isolation and early detection of cases. A critical review of merits and demerits of these measures is presented.

Secondary prevention is through early detection of cases and their prompt treatment. Tertiary prevention, is the prevention of deformities, and rehabilitation of these who are already disabled.

The problems of leprosy are more serious than those due to other diseases. It cannot be judged just on the basis of its prevalence rate alone, even though it is not that low in this part of the country (5 to 10/1000). The long duration of disease before it comes to the notice of health authorities, the long span of treatment necessary especially in lepromatous cases, frequent and persistent deformities and a normal span of life in most cases especially in non lepromatous give the disease a special position which calls for special care.

The disease evolves over a long time and during the course of the disease the pathological changes may become permanent i.e. deformities may appear.

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The aim of prevention as in any other disease is to push back the level of detection and control the risk factors and precipitating factors of the disease.

Literally prevention means 'not permitting the development of disease before it occurs'. In common and current usage, we, however, extend the term to include measures which slow the progress of disease.

There are three levels at which prevention can be carried out.

#### Primary prevention

This can be achieved by the following means :

- A. Reducing susceptibility.
- B. Reducing exposure of susceptible individuals.

A. Reducing the susceptibility: This can be discussed under the following :

1. General health promotion.
2. Immunoprophylaxis.
3. Chemoprophylaxis.

- I. Uganda trial (1960-1971).
- II. New Guinea (1962).
- III. Burma (W.H.O., 1964).

### 1. General health promotion :

Bechelli<sup>1</sup> studied many biologic, socio-economic and environmental factors and concluded that none of these alone can explain the spread of leprosy in different regions of the world. Furthermore, factors like low income, overcrowding, poor housing, malnutrition, low standard of hygiene and ignorance are so closely intermingled with each other that these cannot be dissociated one from another. Nutritional status of a community has an effect on the disease rate in the area. Some recent studies have proved a notifiable effect of protein-calorie malnutrition on immune responses<sup>2</sup>. After giving due consideration to all aspects, Bechelli<sup>1</sup> observed that socio-economic conditions and cultural factors are a common denominator in all areas where leprosy is endemic. The rise in standard of living and education at all levels of the population would lead to natural decrease of the disease in an endemic area. The attainment of these ideal conditions may take a long time probably several decades, even with the fast progress which is being made to uplift the masses.

### 2. Immunoprophylaxis

Unfortunately no specific vaccine has yet been prepared against leprosy. This has been due to difficulty in growing the leprosy bacillus on artificial media.

It was thought that B.C.G. vaccination may be of value in protecting against leprosy. This was presumed because of wide range of common antigens shared by the two mycobacteria<sup>3</sup>. Three controlled B.C.G. trials have been undertaken.

The first trial was conducted on children under 16 years of age who were contacts and relatives of predominantly tuberculoid cases. B. C. G. vaccination reduced the incidence of leprosy substantially and it gave equal protection to all children irrespective of their ages. It thus seems probable that some incubating leprosy infection among older children will be aborted. Protection of 80% against the early forms was recorded.

The New Guinea trial was on a limited population of 5000 persons of all ages with high prevalence of tuberculoid type (60/1000) of leprosy.

The Burma trial was to determine the protection conferred by B. C. G. on the general child population 0-14 years in hyperendemic area with a higher proportion of lepromatous leprosy than in the Uganda trial. B.C.G. vaccination has had no significant effect over a period of about 6 years. The results, however, showed indication that B.C.G. vaccination might be useful in children 0-14 years old and still better in new borns.

As tuberculosis is also a big problem in our country, it may be that B. C. G. vaccination to all new born children can give protection against tuberculosis. Protection against leprosy if at all it occurs would be a by-product at no extra cost. We, however, cannot depend on this for effective control.

### 3. Chemoprophylaxis

Three important studies have been done on this subject. The first one was a double blind chemoprophylaxis trial at Chengelpet (India). The subjects studied were children under 15 years of age who were contacts of

bacteriologically positive index case. Prophylactic dosage was almost equal to conventional treatment dose. An estimated reduction of 52.5% was attributed to chemoprophylaxis. The duration of treatment was upto 3 years after the index case became negative. The second trial was conducted in the Phillippines where the subjects studied were under 10 years of age living in a sanatorium. An estimated reduction of 44.1% was attributed to chemoprophylaxis. The third namely, the Hind Kusht Nivaran Sangh trial sponsored by I.C.M.R. was conducted in 54 villages in 1962<sup>4</sup>. Population covered was below 25 years of age. Reports on this study show that dapsona prophylaxis confers an estimated 50% protection. A further study on chemoprophylaxis with DADDS (Acedapsona) has also been found to yield satisfactory results<sup>5</sup>. It seems reasonable to suggest that chemoprophylaxis should be advocated whenever possible at least to young contacts of index cases.

#### **Reducing exposure of susceptible individuals**

These are specific protection measures which include ;

##### **I. Detection of cases**

Cases of leprosy are detected either by different survey groups or when patients report to the physicians specifically with symptoms pertaining to leprosy or with related complaints.

(a) **Surveys :** School surveys are useful in highly endemic areas. Mass survey is an important method of case detection. In non hyperendemic areas it has limited value. In such areas the most effective and practical method is contact tracing not limited to household contacts.

(b) **Role of general practitioner :** Role of general practitioners in leprosy prevention is of paramount importance.

It is important that both community as well as doctors should recognise early signs and symptoms of the disease. The general practitioner should be able to diagnose the disease during general physical examination. Refresher courses for general practitioners would be of great help in giving them confidence to diagnose cases of early leprosy.

##### **II. Isolation**

In earlier years isolation was recommended. Theoretically it is the most ideal method of reducing the exposure of susceptible individuals. Sato and Nishimura<sup>6</sup> state that leprosy patient should be segregated. In Japan it has been a practice to admit at least those cases which are bacteriologically positive. Worthwong<sup>7</sup> studied 68 children born in the families where one of the parents had leprosy, but already on treatment with sulphone. Ten-year follow-up showed that none of these children developed leprosy even though most of them were sleeping with the affected parent. They hypothesized that compulsory segregation of lepomatous patients is unwarranted.

In India isolation is impractical, since neither the Government nor any agency has the resource to take care of all the leprosy patients in the country. Instead, night segregation has been recommended where during day time the patient remained at work but during night slept in isolation. Night segregation was hoped to reduce the risk of infection especially to healthy family contacts. Besides, if a father, patient could continue to earn for his family and if a mother, she could continue to have some ties with her children.

Even home isolation which is recommended by some can be psychologically damaging and should be discouraged.

##### **Secondary prevention**

The second and perhaps the main means by which leprosy is being tackled

now is by early detection of cases and prompt treatment. This would ensure rapid cure of disease in many cases, reduction of infectiousness in already bacilliferous patients and prevention of deformities.

Early detection can be a most tricky problem in leprosy. Lack of detection is often attributed to ignorance as well as social and cultural backwardness of patient. We believe that our physicians are equally responsible. There is gross lack in teaching of leprosy to our students and paramedical staff. It is therefore, not surprising that early leprosy is missed by doctors even when patients approach them. Attacking the scourge of leprosy is the responsibility of our community, as well as our physicians. In this connection it is necessary to stress that D. D. S. should be made freely available in our country. Patients should not be forced to go to government clinics and be harassed by creating scarcity in market.

### Tertiary prevention

This consists of prevention of deformities and rehabilitation of patients in whom the disease has left residual damage. Physiotherapy, occupational therapy and reconstructive surgery are useful adjuncts in rehabilitating the patient physically and socially. The aim should be to make the patient fit to do some work and also to reduce deformities so that with the existing taboos, he may be sent back to the society.

Tertiary prevention is relatively less important in our country. At this stage we should lay more emphasis on primary and secondary prevention, so that the quantum of disease becomes less. With our limited resources

measures to combat tertiary prevention may have to be postponed.

As regards the levels of prevention Meade<sup>8</sup> recommends that leprosy 'control' must become increasingly concerned with primary prevention. Secondary prevention should naturally continue, as a service but is unlikely to contribute much towards the ultimate eradication of leprosy. At the present time in India it is mostly the secondary prevention which is being tried but it must eventually yield pride of place to primary prevention through the methods enumerated above and the effectiveness of those still unknown general principles which we are sure will become evident as a result of studies going on in various centres.

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