LEPROSY—
Its Therapy and Prevention

By **K. Ramanujam***

PERHAPS the most notable advance in the field of leprosy since the discovery of Mycobacterium Leprae by Hansen in 1873 is the introduction of "sulphone" in the therapy of the disease in 1946. A time there was, in the distant past, when nothing could be offered to patients by way of treatment. For long leprosy was recognised as an infectious disease and the stress was laid on the isolation of cases. Several practices in dealing with the situation were reported to have come to pass. The quickest treatment on record, according to some Chinese, was the "firing squad and quick-lime grave." Another treatment was the "Royal touch." From this stage of strict isolation of the sufferer and studied neglect and cruelty sometimes practised on them, the first ever treatment to be introduced in leprosy was hydnocarpus oil and its derivatives. A Burmese Prince has been credited with the discovery of the value of Hydnocarpus oil in leprosy. This oil and its derivatives certainly had their pride of place in the management of leprosy in the past. But the very prolonged and painful nature of the treatment and the tendency for the disease to relapse were some of its drawbacks.

From the empiricism of hydnocarpus oil and its derivative the treatment of leprosy passed through interesting phases such as the use of Diphtheria Toxoid, aniline dyes etc. then on to Sulphone and its derivatives, and still later to newer drugs.

THE DRUG : Diamino Diphenyl Sulphone, DDS or 'Sulphone' has come to be accepted as the ideal anti-leprosy drug at the present time since it is easily available, easily administrable, effective in a reasonable period of time, non-toxic and CHEAP. The drug was synthesised as far back as 1908 proved to be too toxic in man. In order to bring down the toxicity of DDS, several derivatives were prepared and it was in the year 1941, a derivative of drug, PROMIN, was first used in human leprosy with gratifying results. It was later discovered that this and other derivative of DDS exerted their beneficial effects in leprosy by their being disgraded to the parent sulphone in the human. Hence interest was once again directed towards DDS and therapeutic trials with the drug were started in 1947.

Since the introduction of DDS in the treatment of leprosy several new drugs such as Thiambutosine, anti-tuberculosis drugs, long-acting sulphonamides, antithyoid substances etc. were tried in the therapy of the disease. DDS continues to hold sway as the drug of choice in leprosy. Its low cost, easy applicability and infrequency of the emergence of sulphone resistance when given in conventional doses are its special feature. Its slow bacteriostatic action and the consequent necessity to administer it over periods of time and its inability to clear the body of the effete bacilli are some of its draw backs. Although the drug, over a period of years, is able to bring about a complete disintegration of the lepra bacilli in the skin and even their disappearance in infectious cases of leprosy, it has been found that even after these have been achieved, lepra bacilli continue to lurk in internal organs, bone marrow etc. This emphasises the need for long term treatment in leprosy.

THE TREATMENT PROPER : DDS can be given orally or parenterally. But in a situation where the number of sufferers is large and living in remote rural areas, the route of choice for the administration of the drug is oral. Although the drug could be given daily, twice a week or even once a week, twice a week regimen is recommended. The dose of the drug varies according to the type of the disease. The maximum dose recommended is 10 mg. of DDS/Kg. body weight/ week, but in actual practice the dose of DDS has been arbitrarily fixed as 400-600 mg./week for the adult and 100, 200 and 300 mg./ week for children belonging to the age groups upto 4 years, 5-9 years and 10-14 years respectively. Unlike other bacterial disease where the appropriate drug is given initially in the maximum dose and later reduced, in leprosy the essence of sulphone therapy lies in its slow induction—starting with a small dose, increasing gradually by small doses reaching the maximum dose in 4-6 months. Regarding the duration of treatment, the drug has to be given in the maximum dose till all activity of the disease ceases ; and in order to prevent the occurence of 'Relapse', continuation of treatment for varying periods of time after attainment of inactivity is recommended. In the infectious cases, it is wise to continue the treatment for at least 10 years after attainment of 'inactivity', if not for life time.

The beneficial effects of treatment become apparent in about 3 to 6 months after its commencement in the lepromatous (infectious) cases. The breaking down of lepra bacilli and their gradual clearance from the skin and mucous membrane take as long as 3 to 5 years or even more. In the non-infectious cases, the results are not so striking though these cases take time to be rendered 'inactive'. Although DDS confers much benefit in cases of leprosy, it cannot set right the deformities that had already developed nor can it bring back quickly the colour to be hypopigmented patches. The paralytic deformities sustained by the patient have to be appropriately treated with physiotherapeutic exercises and if necessary, by reconstructive surgery.

The complications of DDS therapy are generally few, if the drug is given under controlled conditions. Anaemia, onset of 'Reactive states', neuritis etc. may occur sulphone therapy. Exceptionally, sulphone hepatitis, psy-

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chosis or Dermatitis has been encountered.

Occurrence of 'sulphone resistance' is rather infrequent, if one administers DDS in the conventional dose. Irregular treatment and inadequate dosage are contributory factors for the occurence of sulphone resistance. Development of sulphone resistance creates a serious situation since the therapeutic management of these cases becomes a problem. Although the vast majority of cases respond favourably to sulphone therapy, there is a small fraction of these who become 'sulphone sensitive' and their therapeutic management also become a matter of serious, concern.

OTHER DRUGS : While DDS continues to be the sheet anchor in the treatment of leprosy, the question of using other drugs in leprosy may arise under two conditions : (i) when the patient has become sulphone sensitive or intolerant and (ii) when the case become sulphone resistant. The drugs, recent entrants to the field of therapy of leprosy, have been found to be useful in the management of these conditions. They are Clofazimine and Rifampicin.

Clofazimine, available as capsules of 100 mgs. each is a versatile drug. It has been credited with antimycobacterial activity, anti-inflammatory properties and effectiveness in sulphone resistant cases. It is by no means recommended for the routine treatment of uncomplicated leprosy, because of the availability of the cheap, safe and effective DDS. Its main use is in the management of sulphone-sensitive and sulphone resistant cases. Its high cost, the pigmentation it produces in the skin and the dry scaly skin that develops after its prolonged use are some of its disadvantages.

Rifampicine, the only drug with a bactericidal effect on lepra bacilli has been found to exert rapid beneficial effects in infectious leprosy and also in sulphone resistant case. Its limited availability and prohibitive cost are positive deterrants from its use. It has a place in the management of sulphone resistant case.

Yet another new drug recently introduced in the treatment of leprosy is DADDS (diaceyl diaminodiphenyl sulphone) or ACEDAPSONE. It is a repository preparation administered intramuscularly in a dose of 225 mg. for the adult once in 75 days. Short term trials with this drugs have yielded satisfactory results. However, the feasibility of successfully carrying out the therapy on schedule in rural areas, the possible emergence of sulphone resistance and occurence of relapse merit serious consideration.

Prevention of Leprosy

Although isolation of infectious cases is by and large the most effective method of controlling the spread of an infectious disease in a community, putting this into operation in the prevention of leprosy is something that is impracticable. In countries where compu sory segregation of active/infectious cases of leprosy has been in force for several decades, leprosy has not been eradicated so far. This is because one cannot legislate away leprosy. Compulsory segregation of cases leads to concealment of the disease, thereby losing the benefits of modern treatment. In the present time, selective isolation of cases, as and when necessary and possible, is recommended in addition to treatment of all active cases of leprosy. The sufferers from leprosy, especially infectious cases, should as far as possible, avoid coming in contact with the community at large, especially children. Home isolation, as and when possible, still has a place in the prevention of spread of leprosy.

In the absence of an effective vaccine for the protection of the community against leprosy infection, other methods of prevention have been thought of. One such is Chemoprophylaxis, that is administration of DDS orally to contacts of cases of leprosy. Such a study (carried out by the Central Leprosy Teaching and Research Institute in Chingleput District, Tamil Nadu) in child contacts of infectious cases of leprosy has yielded satisfactory results. It has been found to bring about a reduction of 53% of the disease in children exposed to infection. However, one has yet to determine how long the prophylaxis should be given, the optimum dose of DDS, and the frequency of administration of the drug by mouth.

Another method of prevention of leprosy first attempted as far back as 1939, is immunoprophylaxis viz. the administration of BCG vaccination to contacts of leprosy cases. The more recent controlled field trials with BCG in Africa, Burma and new Guinea, have yielded divergent results. Hence it is 'considered premature to recommend BCG vaccination for the protection of leprosy' at present. □

"The population has a right to health and medical care, and will not for long tolerate a lack of facilities for themselves while disproportionate funds are allocated to the favoured few. The only way of delivering comprehensive medical care to the masses is by means of a chain of all-purpose dispensaries, manned by polycompetent medical auxiliaries trained and provisioned and supervised. Investigation and surveys conducted by successive teams for purposes of indicating diseases and not accompanied or followed by treatment leave the average villager bewildered and disappointed. And if treatment is provided for one disease which may not be serious or fatal or widespread, he becomes frankly puzzled. Leprosy, on these grounds, should be regarded as one of the many conditons and diseases to which human flesh is heir, and treated accordingly at an all-purpose clinic.

"If existing knowledge about leprosy were conscientiously and persistently applied, the disease could be controlled in our generation and eradicated in the next."

Dr. Stanley G. Browne, Director, Leprosy Study Centre, London. (From MEMORANDUM ON LEPROSY CONTROL)