Note on the Treatment of Leprosy by Intradermal Infiltration.

E. MUIR.

(*Reprinted from "Leprosy in India," July*, 1932.)

OF all the methods of administering hydnocarpus oil and its preparations the intradermal is in our experience the most effective. The purpose of this method is to infiltrate the lesions themselves which are principally in the corium of the skin. Sometimes lesions are found in the subcutaneous tissue, in which cases deeper injections should be given.

In some ways the esters are more convenient for infiltration than the oil as they are less viscous and therefore pass more easily through the intercellular spaces without disrupting the tissues. Pure hydnocarpus oil on the other hand with 4% creosote added, if heated to the highest temperature tolerated (*i.e.*, about 45° C.), looses its viscosity and can be infiltrated intradermally with ease. It is important that the oil used should be prepared from ripe, fresh seeds, and should be extracted from the seeds by pressure in the cold. It should be stored in a cool place and in air-tight containers. In India the great advantage of the oil is its cheapness, an important consideration when large numbers of poor patients have to be treated. When bought in bulk it can be had for 14 annas a pound. As to the comparative efficacy of the oil and esters when given intradermally, it is difficult as yet to make a definite statement. Certainly the oil does not appear to be any less effective than the esters in clearing up local lesions. We find that the oil when first injected is slightly more irritating than the esters, but that

the irritation passes away more rapidly than when the latter is used.

Sodium hydnocarpate (or the proprietary preparation "Alepol") can be given in a 1, 2, or 3 per cent. solution intradermally; but, whatever its comparative general therapeutic power may be when given intravenously, intramuscularly, or subcutaneously, we find that its local effectiveness in clearing up lesions is inferior to that of the esters and oil. This is probably due to its being quickly absorbed into the general circulation, whereas the esters and oil are taken up by the local cells and there continue to exert a beneficial effect in the infiltrated area for several weeks or months. Almost all skin areas showing either visible lesions or deep analgesia are suitable for intradermal infiltration. Areas, however, should not be infiltrated in which deep analgesia is due to blocking or destruction of the nerves supplying the part, and not to local invasion of the skin by M. lepræ; such a condition is commonly found in the distal parts of the extremities. On the other hand infiltration of the skin covering a thickened, superficial nerve trunk, such as the ulnar, is sometimes found to cause marked improvement, the thickening and tenderness clearing up with relief of the signs and symptoms in the parts supplied by the nerve.

Technique.

A 2 c.c. or 5 c.c. syringe with closely fitting needle is used. The quantity to be injected is drawn up or poured into the syringe. If oil is used its temperature must be at least 45° C. as mentioned above. An area of suitable skin is selected, marked off with a grease pencil and sterilised with spirit of iodine. Infiltration is made through a number of punctures from 6 to 10 mm. apart. At each puncture about half a minim is injected which raises a wheal about 10 mm. in size. If the skin is thick, instead of a wheal rising the skin markings stand out in greater relief than those of the surrounding skin. If a large area of skin surface has to be covered the punctures may be spaced more widely apart. In making the injections the needle should be sloped to an acute angle with the skin surface and should not enter the skin more than 2 or 3 mm. If the appearance of a wheal or more evident skin markings is not produced it is a sign that the needle has been inserted too deeply. Where, however, the lesion is deeper than the skin, *i.e.*, in the subcutaneous tissue, or where thick nodules are found, deeper injections should be given. For every

cubic centimetre of the drug injected some 32 punctures are necessary. Some patients will tolerate a larger amount injected at each point, but, at least to begin with, the above rule should be observed in every case.

The dose will vary according to the tolerance of the patient from 0·5 to 5 c.c. given once or twice a week. In patients with good general health and firm muscles, and who are taking a fair amount of daily exercise, the larger doses are tolerated; but it is well to begin with the lower doses and gradually work up to the higher ones. The larger the dosage the quicker the progress, provided it is not above the patient's tolerance. On the other hand injections which are either larger or more frequent than the patient can stand tend to lower the general resistance and may lead to an exacerbation of the disease. It is often necessary to wait for weeks or months before beginning injections if the patient is in poor health or shows signs of "lepra reaction." Likewise, special treatment may have to be intermitted for similar reasons. Meanwhile, every effort should be made to improve the patient's general health. The sedimentation test is invaluable in estimating the tolerance of the patient and in regulating the frequency and amount of injections.

Choosing Sites for Infiltration.

When infection is widespread over the body it is often well to begin with the back of the trunk as it is less sensitive and the process of injection cannot be seen by the patient. The face and other more sensitive regions are reserved for later when the patient has become more accustomed to the treatment. The physician should keep a note of the dates of treatment and of the parts infiltrated on each date, so that he may proceed systematically and gradually cover all the areas affected. It must be remembered that microscopic examination will often show the skin to be markedly affected in parts where there is no outward appearance of a lesion. Therefore, if deep analgesia is present, one should not necessarily consider the absence of a visible lesion as a contraindication for infiltration. In patients with marked nodules, especially if these be hard and fibrous, it is sometimes well to begin by infiltrating these nodules, the more diffuse lesions being treated later. An ordinary hypodermic needle is inserted till the point reaches the middle of the nodule and 2 to 4 drops of the oil or esters are slowly injected. The nodules will swell up at first and later shrink either with or without liquefaction and discharge of the contents.

Reinfiltration.

Lesions should as a rule not be infiltrated a second time till after a month has elapsed. In cases with widespread lesions it may take six months before the whole body is covered. It should be remembered that the oil and esters remain in the cells of the skin for a considerable period, and that progressive improvement goes on in the parts once infiltrated. If there are few lesions it may be possible to cover them all at one or two sittings. In such cases intramuscular injections into the gluteal region or subcutaneous injections may be given on the days that skin lesions are not available ; or, if the patient's resistance is high (especially towards the end of treatment) he may be injected at two or four weekly intervals.

General Considerations.

If skilfully carried out, intradermal infiltration does not cause excessive pain and we seldom find patients objecting to it. Analgesia, though not complete, is sufficient in most cases at the beginning of treatment to make the injections bearable. Reinfiltrations are often more painful but seldom beyond the tolerance of any but the most sensitive patients. If, however, a lesion is reinjected before the induration caused by the previous infiltration is absorbed, much pain results and even ulceration may occur. Other causes of pain and ulceration are : injection of too large a dose at any one point ; injecting too superficially into the epithelium ; injection of irritating and impure oil or esters ; injection of oil which is too viscous due to its not being sufficiently heated.