COMMENT. SENSORY TESTING OF THE HANDS IN LEPROSY

Editor,

We would like to respond to the interesting letter of colleagues Saunderson *et al.* in the September 1997 issue of *Leprosy Review*, **68**, 252. Both our groups clearly have the same goal of preventing permanent nerve damage in persons affected by leprosy. For this, we believe that we need a robust test that will detect neural impairment reliably and as early as possible, and that can be used under field conditions. This is a tall order for any test.

Like Saunderson and colleagues, we believe that graded monofilaments are currently the tools most suited to the task. We introduced sensory testing using monofilaments in our project in early 1992. This filament was only used in Green Pastures Hospital, not in the field programme. Since our normative study in 1993, we have been advocating the use of only two screening filaments for the field, 200 mg for the hand and 2 g for the foot.[1]

In contrast to Saunderson *et al.*, and given that neural impairment is not always reversible, we feel that we should give treatment as early as possible, even if this means treating some patients who may not really have needed treatment. The low incidence of side-effects of the current steroid regimens, in our opinion, justifies such an approach.[2] In terms of diagnostic test design, we demand a test of high sensitivity, accepting loss of specificity and treatment of false positives. Two questions therefore arise: Is this assumption of a better prognosis with early detection valid, and is sensation loss detected with a thinner filament—'mild sensory impairment', the same as early sensory impairment?

Saunderson and colleagues show that among 12 out of 15 patients with mild sensory impairment, who were available for follow-up after 6 years, only one person had developed secondary impairment. While this may be considered a 'good long-term result', no conclusions can be drawn for such a small sample. In addition, one could ask how much *disability* the other eleven persons experienced because of their sensory impairment?[3] We have shown that beyond a monofilament level of 2 g, functional sensibility of hand is likely to be affected.[4] In a further study, we found that sensory impairment at this level is a major disabling factor in activities of daily living among persons affected by leprosy (van Braker *et al.*, submitted).

Saunderson *et al.* conclude from their study that, had a more sensitive test been used, through the use of a different diagnostic cutoff, a large number of patients would have been treated for neuritis, 'many of whom may not really need it'. At present we have to accept this difference of opinion, since to our knowledge there is no unequivocal scientific evidence for either point of view. One of the studies in the TRIPOD trials, which are due to start early 1998, is designed to answer this question. The TRIPOD trials are randomised, double-blind studies looking at various questions in the treatment and prevention of nerve damage in leprosy, to be conducted multi centre in Bangladesh and Nepal.

The purpose and strategy of testing

The purpose of our test is the most important factor in the choice of filaments to use. If it is a screening test, a single filament at the chosen cutoff can be used. One filament for the hand and one for the foot is sufficient. The choice has to be made as to whether to screen for normal sensation or for the presence of protective sensation. In either case, an appropriate monofilament threshold should be chosen. According to available evidence, the threshold of (residual) protective sensation is 2 g for the hand,[5,6] and 10 g for the foot.[7–9] From this point of view, screening with a 10-g filament seems reasonable for the foot, but not for the hand. Last year we completed a large normative study ($n = 697$), aimed at determining age-specific normal values for monofilament testing. Except in young children and among the elderly, the previously found values of 200 mg for the hand and 2 g for the foot were still upheld. These filaments were felt by 95% of the (mostly rural) healthy volunteers tested. (Anderson *et al.*, in preparation). It is interesting that the normal thresholds found in Nepal very closely match those found in India.[10] Choosing a filament giving a pressure many times the normal threshold, or the threshold of protective

sensation (such as the 10-g filament used by Saunderson and colleagues) increases the specificity of the test, at the cost of sensitivity.

If the purpose of testing is monitoring of nerve function in a patient who we are testing for sensory impairment, a test using several 'levels' of graded filaments is preferable. This allows assessment of whether the patient is improving or, sometimes, deteriorating further. If only one filament is used, changes are hidden once the patient can no longer feel that particular threshold.

Practical considerations

One cannot always easily get the monofilaments one would like to use. We have no stock of 1-g filaments and have therefore not used these routinely. Having a filament of ~100 g would also be desirable, to replace the 300 g filament, which has less than ideal buckling properties. It would be a great advantage if someone could make monofilaments available cheaply and in bulk. Perhaps ILEP could help in this?

The thinner filaments are more likely to become permanently bent. However, in our experience, the 200-mg filament can be used, provided the handle is constructed so that it can serve as a protective cover for the filament when not in use. In our field programme we use handles made of cheap ballpen shafts.

The choice of filaments may also be dependent on the skill, workload and motivation of the staff. In our experience, specialist leprosy staff of almost any level can learn to use the pocket monofilament set reliably. In the integrated field programme, where leprosy work is done by multipurpose health workers, nerve function assessment still leaves much to be desired. This is probably due to a combination of general patient work load, lack of motivation and low priority given to leprosy work. It is unlikely that this has anything to do with the thickness of the filaments used. Most can use the two-filament threshold test acceptably well, when they leave our Comprehensive Leprosy Training course.

In conclusion, it is acceptable to differ between projects in the diagnostic threshold chosen, because of local requirements. The sensitivity and specificity of the diagnosis 'sensory impairment' does not only depend on the choice of filament. It is the combination of factors that needs careful consideration in the light of the purpose of the test. Let us continue to work on this together, to save as many people as possible from permanent nerve damage.

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