

GRADING IMPAIRMENT IN LEPROSY

Editor,

With interest we read the article 'Grading impairment in leprosy' by Van Brakel *et al.* in *Leprosy Review* **70**, no. 2. It would be an advantage for the management of leprosy control programmes if there was a simple accurate indicator to measure changes in impairment. This indicator could help to monitor how well a programme is able to prevent impairments. Reporting on Prevention-Of-Impairment-and-Disability (POID) activities would encourage the health workers to take this part of the work seriously.

In leprosy, the major impairments are caused by nerve damage: loss of sensation, loss of muscle power in hands, feet and eyes. Secondary impairments (e.g. wounds) can develop in addition to these primary impairments. These impairments can be measured and scored. The presently used WHO impairment grading system has the advantage that it is relatively simple. Eyes, hands and feet are examined for impairment caused by nerve damage. Disability grade 0 means no anaesthesia and no visible impairments or damage, disability grade 1 means that there is anaesthesia but no visible deformities or damage and grade 2 means that visible deformities or damage is present. The WHO impairment score is the maximum score found in any eye, hand or foot (range 0–2).

This WHO impairment grading system has serious limitations. The basic problem is that this grading system combines in one figure three basically different impairments. This does not justice to the three different components.

1. The impairment grade is not a good measurement for the severity of the impairment. Visible deformities are graded to be more severe than invisible ones. However, a person with loss of sensation in both hands and feet (grade 1) is more at risk of becoming severely disabled than a person with only paralysis of one small finger (grade 2). Grade 2 shows a different impairment than grade 1 (or a combination of impairments).
2. There is a wide range of severity of impairment in each category, e.g. disability grade 2 can mean paralysis of a little finger or loss of all fingers.
3. Voluntary muscle testing and sensation testing used for impairment grading are not always easy to score. In many patients, nerve damage causing the impairments is not complete. These slight changes in sensation and muscle power are often difficult to interpret, especially for general health workers with limited experience. The impairment may change over time with increasing and decreasing immune response.
4. The impairment grade can alter by small changes in impairment. On the other hand, large changes in impairment do not always alter the impairment grade. Improvement from grade 2 to 1 and *vice versa* may only be a wound appearing or healing. On the other hand, the disability in a hand may have improved very much without this showing in the disability grade (e.g. due to permanent loss of a finger).
5. The grading system depends on the accuracy of the sensation testing and the voluntary muscle

Table 1. Changes in impairments in 40 patients who started leprosy treatment at Abu Rof in 1997

Impairment	Improved	Same	Worse
Sensation	5	31	4
Muscle power	4	33	3
Secondary impairments	–	39	1

testing of the health workers. In addition, other factors may influence the accuracy of a test, e.g. noise in a clinic may distract the patient during the test. Changes in disability grade may reflect changes in accuracy more than changes in actual impairment.

- Not all programmes use the same grading system. Weak muscles are graded in some programmes as grade 0, whereas this constitutes an impairment. Other programmes consider weak muscles to be grade 1. The WHO grading system used to consider lagophthalmos as grade 1 but changed this to grade 2. Some programmes may still use the old system.

The 'WHO sum impairment score' is used in some programmes. In this grading system, the disability grades of hands, feet and eyes are added up together. Thus the impairment sum score of a patient ranges between 0 and 12. The advantage of this grading system is that it gives a better idea of the extent of the impairment. The disadvantage is that it is slightly more complicated than the WHO grading system. It still has all the problems of combining different impairments in one figure. As it has a larger range, the idea is that this grading system could monitor the changes in impairments better.

Van Brakel *et al.* demonstrate that impairment sum score (adding up the Eyes, Hands and Feet disability scores) changes more in patients than the maximum impairment score, which is used at the moment. The question is whether these changes measure a real change in impairment.

At the Abu Rof leprosy clinic in Omdurman Province, Khartoum State, Sudan, we looked at the changes in impairment of the patients who started treatment in 1997. We scored sensation, muscle power and secondary impairments separately and calculated the WHO impairment score and the WHO impairment sum score. Out of 68 patients who started treatment, 40 patients completed the treatment, from whom we could get all the necessary data. Like Van Brakel *et al.*, we noticed that the changes in disability grade were larger when the WHO impairment sum score was used, compared to the WHO maximum impairment score (changes in four patients instead of two). The total score did not detect the changes in impairment in five patients, whereas it gave an improvement in impairment score for one

Table 2. Changes in impairment in 40 patients who started leprosy treatment at Abu Rof in 1997 compared to changes in the WHO (maximum) impairment score

Impairment	WHO impairment maximum score			Total
	Improved	Same	Worse	
Improved	1	3		4
Changed (+ and –)		2		2
Same		30		30
Worse		3	1	4
Total	1	38	1	40

*Improved is improvement in one of the three impairment scores without deterioration in another

Table 3. Changes in impairment in 40 patients who started leprosy treatment at Abu Rof in 1997 compared to changes in the WHO impairment sum score

Impairment	WHO impairment sum score			Total
	Improved	Same	Worse	
Improved	2	2		4
Changed (+ and -)	1	1		2
Same		30		30
Worse		3	1	4
Total	3	36	1	40

patient who had worsening of sensation and improvement of muscle power (Tables 1–3). These results show the complications of adding up three different types of impairment into one score.

We doubt whether WHO impairment score is a good instrument to measure Prevention of Impairment and Disability because:

- the impairment score does not reflect the severity of the impairment.
- it does not detect changes in impairment well.
- changes in the score may not reflect changes in actual impairment.

The WHO impairment sum score has no real advantages here. It does give a better idea of the severity of the impairments of the patient than the WHO maximum score and it is more sensitive to changes in impairment, but still has all the limitations attached to the WHO impairment score. In the sum score, it is even more unclear what a certain score actually means in terms of impairment. Instead of being more accurate, this score may multiply the confusion by six, while giving a false sense of accuracy.

It is important to include indicators for Prevention of Impairment and Disabilities in the reporting of leprosy control programmes. Specialized programmes may continue to measure the change in the different impairments separately to evaluate the quality of POID activities. This will not be possible for integrated programmes. Here instead of an outcome indicator, output indicators could be used (e.g. what percentage of patients have wounds at the beginning of the treatment and what percentage at the end, what percentage of patients was diagnosed to have a severe reaction and what percentage of these completed the reaction treatment).

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Reference

¹ Van Brakel WH, Reed NK, Reed DS. Grading impairment in leprosy. *Lepr Rev*, **70**, 180–188. Table 1. Changes in impairments in 40 patients who started leprosy treatment at Abu Rof in 1997.