Lepr Rev (2000) **71**, 270–272

COMMENTARY

A PROSPECTIVE COHORT STUDY COMES OF AGE

The current issue of *Leprosy Review* contains a record seven papers from the same study group which together present the findings of the ALERT MDT Field Evaluation Study (AMFES), ripe fruit harvested 12 years after its planting in 1988. In the published literature, there are only three longitudinal, prospective cohort studies which report the outcome of leprosy patients treated with MDT. They are: Schreuder's cohort from Thailand,[1–3] the Bangladesh Acute Nerve Damage Study (BANDS),[4–7] and AMFES from Ethiopia. Each study reports on a different study population: AMFES from Africa, and the other two from ethnically distinct Asian countries. AMFES and the Thailand study are of similar size (AMFES 650, and Thailand 640 patients) while BANDS is rather larger with a cohort of 2,664. The BANDS papers present findings after 2 years of follow-up; the Thailand publications after 8 years; but the AMFES corpus published with this commentary reports findings 11 years from the time of first recruitment. This, combined with the breadth of the published material, gives the AMFES series a unique position in this trinity of cohort studies.

Four earlier papers have been published using the AMFES cohort. In 1994 De Rijk *et al.* wrote about the study organisation and methodology, giving preliminary reports after 5 years on MDT completion and the occurrence of reactions and neuritis on just 286 patients.[8,9] As an offshoot, De Rijk and Byass used the same group to compare 10 g and 1 g monofilaments for the sensory testing of hands, concluding that the 1 g filament was a more sensitive tool;[10] and Meima *et al.* used a larger group (592 patients) in their study, which found that age and delay in presentation were associated with the presence of impairments in new leprosy patients.[11]

The first paper sets out the methodology and objectives of the study. The objectives were to determine the incidence of relapse, reactions and nerve dysfunction amongst the cohort patients: the subsequent papers show how far this has been achieved. A single line from this paper is a poignant reminder of the very human element involved in leprosy: *'There were far fewer pregnancies in the AMFES women after the diagnosis of leprosy'*.

The second paper provides us with the real meat of the study by detailing the pattern of leprosy-related neuritis in the cohort. At a single sitting, the incidence, risk factors and outcome of neuritis are presented. There is much important material here that needs careful consideration. The finding that over 80% of all nerve damage had occurred before diagnosis emphasises the priority of public health education in control programmes. Recovery from acute neuritis using prednisolone treatment was excellent at 88%, a figure higher than that reported from other studies, including BANDS. A significant proportion of the recovery occurred *late* – well after a year – underlining the importance of 'the long view'. Interestingly, spontaneous recovery of nerve damage was found in up to a third of nerves,

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confirming a similar finding from Bangladesh.[7] Chronic and recurrent neuritis were identified as very important risk factors for poor outcome. Surprisingly, multibacillary leprosy was *not* identified as a significant risk factor for the development of neuritis. This probably reflects the classification system in use at the time which assigned all smear-negative BT patients as paucibacillary; the current WHO system would have assigned patients with six or more skin patches to the MB group. The AMFES PB group was thus 'more multibacillary' than comparable PB cohorts.

The subject of relapse after fixed-duration MDT is very topical, and it is reassuring that there were *no* relapses diagnosed in the AMFES cohort, even amongst the 57 cases with an average bacteriological index (BI) of ≥ 4. This is an interesting counter-balance to some papers telling an opposite story.[12,13] However, the number of high-BI patients who have had follow-up for more than 5 years (20) is small compared with 260 in the Indian study reported by Girdhar.[13] It is important that the small AMFES group are followed up – and this is planned for a further 5 years. A further interesting point is that, as has been stated, the AMFES PB leprosy group included a number of multi-lesional (smear negative) BT patients who would have received MB-MDT today. There was no relapse amongst them either, despite only receiving PB-MDT.

Related to the relapse topic is a further paper reporting the pattern on decline in the BI after MDT. The study group found that a delay of less than 3 years to presentation and more severe impairment at start of MDT were both significantly associated with a faster drop in the BI – why this should be so, is not clear! The occurrence of reversal reactions did not increase the speed of clearance of bacilli.

The incidence and risk of reversal reactions in the skin are the subject of another paper. Not surprisingly, borderline leprosy emerges as the major risk factor while the initiation of MDT was also (importantly) found to be an important risk factor for up to 12 months after the start of treatment. HIV infection, pregnancy and lactation at the time of diagnosis and female gender (independent of pregnancy and lactation) were all also found to be more weakly associated with a greater risk of reversal reaction. A similar study on the incidence and risk factors for ENL reactions found that co-infection with HIV was strongly associated, not surprisingly, that LL leprosy and a BI of 6. However, the numbers were small: only 16/300 MB patients (5%) developed ENL.

Finally, the effect of HIV status on the clinical picture of leprosy was examined. The total number of HIV-positive individuals was small, 22 amongst 581 patients tested (4%). Not surprisingly, there was an excess of deaths among the HIV-positive group (27%) compared with the HIV-negative group (6%). There was a higher risk of developing ENL, and a weaker association with reversal reactions; but no association with developing MB rather than PB disease, or with the development of impairment.

It should be clear to the reader what a wealth of important material has resulted from this long-term study. Prospective studies have a very important place in enhancing our understanding of the interaction between *Homo sapiens* and *Mycobacterium leprae.*

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