Point of view / Point de vue

Evaluation and determinants of outcome of tuberculosis treatment

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The most important determinant of the outcome of treatment of tuberculosis (TB) patients is the access that they have to reliable diagnosis and treatment services organized within a national tuberculosis programme (NTP) as part of DOTS, the name of the WHO-recommended TB control strategy. Accurate evaluation of treatment outcomes requires inclusion of all patients diagnosed, including those not registered; part of routine NTP management should therefore involve regular cross-checks between laboratory diagnostic registers and NTP treatment registers. Finally, control services should take into consideration the type of TB, the presence of concomitant infection with human immunodeficiency virus (HIV), and patient characteristics.

In the preceding article, Glynn et al. (*1*) report the outcomes of treatment of tuberculosis (TB) patients in Karonga District, Malawi, between 1986 and 1994 and analyse the determinants of outcome (e.g. patient characteristics and type of TB). The most important determinant of the outcome of treatment of TB patients is access to reliable diagnosis and treatment services organized within a national tuberculosis programme (NTP) as part of DOTS, the name of the WHO-recommended TB control strategy (*2*).

The performance of the Malawi NTP is one of the best in sub-Saharan Africa (*3*) and the programme in Karonga District has benefited since the early 1980s from the substantial contribution of the Karonga Prevention Study (KPS) of leprosy and TB. In addition to the standard TB control activities of the NTP in Karonga District, the KPS has contributed enhanced case-finding and case-holding activities. Karonga District therefore represents a highly developed system for TB control activities, with benefits for TB patients in the district, who have access to excellent control services, and for epidemiologists, who have access to data on TB case finding and treatment outcomes for the analysis of the determinants of treatment outcomes.

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There are three types of implications arising from this article for TB control, as discussed below.

- First, well-organized TB control services in line with the DOTS strategy are necessary to ensure that TB patients have the best chance of successful disease detection and treatment outcome. Patients not registered by the Ministry of Health NTP had much higher mortality and default rates than did registered patients.

- Second, accurate evaluation of treatment outcomes depends on how the NTP measures these outcomes. Failure to include all patients diagnosed (i.e. ignoring those who are diagnosed but not registered) results in an over-optimistic evaluation of treatment outcomes. In Karonga, the inclusion of patients who were diagnosed but not registered gave a true case fatality rate of 16%, compared with a rate of 13% when only those patients who were registered were considered. The proportion of patients diagnosed but not registered was 8% of the total in a district with excellent TB control services. Since in urban areas of Malawi, 10–25% of sputum-smear-positive patients are diagnosed but not registered (A.D. Harries personal communication, 1997), the bias in underestimating the TB case fatality rate is likely to be much greater than in Karonga. Part of routine NTP management should be regular cross-checks between laboratory diagnostic registers and NTP treatment registers by district tuberculosis officers and during regular supervisory visits by regional tuberculosis officers. NTP staff should use the number of patients diagnosed rather than the

number registered for treatment as the denominator in compiling the statistics for treatment outcomes.

• Third, the organization of TB control services has to take into consideration the determinants of outcome relating to the type of TB, the presence of concomitant infection with human immunodeficiency virus (HIV), and patient characteristics. The outcome measure which provides the earliest indicator of NTP performance is the sputum smear conversion rate when a whole cohort of patients has completed the 2 months' initial phase of treatment. The initial degree of sputum smear positivity, and the patient's age, but not HIV or BCG status, influenced sputum smear conversion rates.

The increased risk of death in HIV-positive patients both during treatment and in the post-treatment period poses considerable challenges to NTPs, most importantly because one of the aims of TB control is to save lives, but also because a high case fatality rate is likely to have an adverse effect on NTP credibility. Earlier diagnosis in the course of the illness may result in lower TB case fatality. Possible measures to achieve earlier and more rapid diagnosis include better training of health care workers and health education aimed at increasing public awareness of how to recognize TB and obtain the appropriate response from health services.

Case fatality in the study by Glynn et al. was higher among patients diagnosed to be sputum-smear-negative or extrapulmonary TB cases than among those who were sputum-smear-positive. This arose largely because the diagnosis of smear-negative and extrapulmonary TB is not based on a gold standard test and so many of these patients have a disease other than TB, which often proves fatal. More rigorous application of the diagnostic criteria for smear-negative TB may reduce the proportion of patients misdiagnosed to have pulmonary TB. While this may decrease "TB" case fatality by removing nontuberculosis patients, those patients with potentially treatable conditions will still die unless clinicians make the right diagnosis. The involvement of NTPs in a broader approach to the clinical care of adults with respiratory symptoms is likely in future.

Innovative approaches are necessary for the management of HIV-related diseases other than TB, which are responsible, in part, for the excess case fatality among HIV-positive TB patients. Research is currently in progress to assess whether routine broad-spectrum antibiotic prophylaxis may decrease case fatality by reducing the risk of severe bacterial infections. None of the above measures is likely to have much impact on the observed trend in increased post-treatment case fatality resulting from the maturing HIV epidemic and the increased proportion of people living with HIV who have a more advanced stage of infection.

Résumé

Issue du traitement antituberculeux: évaluation et déterminants

Le déterminant le plus important de l'issue du traitement antituberculeux est l'accès à des services fiables de diagnostic et de traitement organisés par un programme national de lutte antituberculeuse (PLT) dans le cadre du DOTS, nom donné à la stratégie de lutte antituberculeuse recommandée par l'OMS. Pour obtenir une évaluation exacte des résultats du traitement il faut que tous les patients diagnostiqués soient inclus, y compris ceux qui n'ont pas été enregistrés; la gestion du PLT en routine doit donc comporter une vérification croisée systématique des registres de diagnostic du laboratoire et des registres de traitement du PLT. Enfin, les services de lutte doivent tenir compte du type de tuberculose, de la présence d'infections concomitantes associées au virus de l'immunodéficience humaine (VIH), et des caractéristiques du patient.

References

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3. *Global tuberculosis control: WHO report 1997.* Unpublished document WHO/TB/97.225 (available upon request from Global Tuberculosis Programme, World Health Organization, 1211 Geneva 27, Switzerland).