Still screening for pulmonary tuberculosis?

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The introduction of mass radiography was an important event for the detection of pulmonary tuberculosis after the Second World War, when the prevalence of disease was high and the accessibility of health services for the public was low. The detection rate was considerable and the method contributed to the antituberculosis programmes a great deal; the question of controlled design and follow-up of screening procedures was of no interest at that time.

Mass miniature radiography for pulmonary tuberculosis was still, in the 1970's, the largest screening procedure ever carried out on the initiative of the public health services. The WHO expert Committee on Tuberculosis [1] shook the system by recommending the phasing out of indiscriminate case finding by mobile mass radiography. By this time many countries were beginning to notice the lack of built evaluation and of calculations of the costs and benefits of the system; the time was gradually becoming ripe for the reassessment of the programmes.

The idea behind periodic screening for tuberculosis was to detect all the sources of infection at an early stage and thus to achieve a favourable epidemiological impact. Even before the advent of chemotherapy, it was known that the most “dangerous” patients are those with cavities and with enormous amounts of tubercle bacilli in their sputum, i.e., smear-positive cases. By contrast, patients positive by culture infect their contacts only slightly more than smear- and culture-negative patients. Consequently, it is not justified to classify smear-positive and culture-positive patients together in terms of epidemiology. This fact still remains valid in low prevalence countries.

Only in a few mass radiography surveys have the detected cases been grouped according to the bacteriological status; in most surveys all the “tuberculosis cases” discovered are listed together. In research conditions, however, the yield of smear-positive patients in mass radiography has not been more than about one-fourth [2]. In the Finnish programme evaluated in 1984 only 11 per cent of smear-positive cases and 18 per cent of all cases of tuberculosis were detected by selective mass screening (Liippo, unpublished). Certain countries also include not only cases discovered by screening but also those diagnosed at out-patient clinics. The number of patients put on chemotherapy without bacteriological verification varies between countries from two thirds to one tenth [3, 4]. Consequently, the concepts used vary so much that the comparison of the efficacy of different programmes is almost invalidated by all the bias factors.

Even without controlled trials it became evident with the improving tuberculosis situation that mass radiography is only viable on a selective basis in high risk groups. The computerized selective screening system was introduced in Norway very early [5]. In South West Finland a computer-based system was developed in the early 1970’s [6]. The computer prepared a list of persons screened at intervals of 1–4 years depending on their individual risk, comprising factors such as age, sex, diabetes, smoking, and fibrotic lesions. However, during recent years the detection rate has decreased and the costs per detected case are now almost the same as for a patient with coronary bypass surgery. Consequently, the programme has fulfilled its function and come to an end.

The Europe Region of the International Union Against Tuberculosis and Lung Disease conducted a survey in 1985–1986 on the use of mass radiography [7]. Only in three countries out of 13 was the system not under reconsideration or about to be discontinued. Of course every country must make its decision on the basis of the local epidemiological situation, which varies very much even in Europe [4]. It is clear, however, that selective and highly sophisticated mass radiography systems on a large scale for tuberculosis alone will soon disappear from Europe.

However, screening may still be beneficial in certain subgroups. In the SW Finnish system the detection rate among alcoholics has for years been about ten times that for the general population (Liippo, unpublished). In the previous issue Herer and his co-workers analyze a radiologically and clinically detected group of tuberculous patients (pages 3–6). More than a quarter in the radiologically detected group were smear-positive. Among the asymptomatic patients 20 per cent were smear-positive and another 20 per cent had cavities.

The usual reason cited for the disadvantage of mass X-ray has been that above 90 per cent of smear-positive patients have symptoms at the early phase of the disease, and are therefore mainly diagnosed between rather than at screenings [2]. The situation in certain subgroups of patients may be different, however, and screening in one way or another may have a role in

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the monitoring of groups such as alcoholics and vagrants; the HIV-infected should perhaps also be included. In the eradication of tuberculosis, the screening of small high-risk groups with high yield may be feasible, and then the concept of screening takes on a new meaning similar to when screening was originally introduced to identify disease in large populations.

A new screening system has recently also been presented by Chretien and his group [8]. The method has been shifted from tuberculosis to other pulmonary diseases such as lung cancer and obstructive lung disease. This large-scale multiphasic screening was performed in Paris yearly from 1981 onwards among about 37,000 people from the general population, aged 20–60 years. A self-administered questionnaire, chest X-ray, lung function examination and medical interview were all included. The final results are being awaited with great interest in order to assess the benefit. Indiscriminate screening has already gone, but selective screening still has a role to play and multiphasic screening is under evaluation.

References