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The Role of Medical Schools in Tuberculosis Control

Prof. Lalit M Nath and Dr Jai P Narain

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1. INTRODUCTION

Tuberculosis continues to remain a major public health problem, particularly in the South-East Asia Region. Of 8 million TB cases and 3 million deaths occurring every year worldwide, 40% are reported from this Region[1]. The situation may get further complicated because of the rapid spread of HIV and emergence of drug-resistant strains of tuberculosis.

It is estimated that about one-third of the world's population is infected by *Mycobacterium tuberculosis*. Deaths from tuberculosis comprise 25% of all avoidable deaths in the developing world. 75% of tuberculosis cases occur in the age group 20-49, which represents men and women in their most productive years. In 1993, tuberculosis was declared by WHO to be a global emergency. One of the main reasons for the increasing tuberculosis burden is the neglect of tuberculosis control programmes, resulting thereby in inadequate case detection and management and poor cure rates. This needs to be addressed urgently.

Tuberculosis is indeed curable and its control possible through a policy package called Directly Observed Treatment, Short-course or in short "DOTS" strategy. This represents an organizational framework for effective utilization of the existing tools for diagnosis (sputum smear microscopy) and treatment (short-course chemotherapy). DOTS has been characterized by the World Bank as one of the most cost-effective of all health interventions. It has been recommended that effective short-course chemotherapy for smear positive patients should form a part of the essential clinical services package available in primary health care.

In all Asian countries which have adopted this WHO advocated tuberculosis control policy, a trend towards improvement in the detection of infectious cases (smear positive) and towards achieving cure/success rates of between 80% and 90% of detected cases has been noted. However, the coverage with DOTS in the Region still remains very low. In 1998, only 10% of the population in the South-East Asia Region had access to the DOTS strategy, which increased in 1999 to 27%. Even then, in many countries, including India, the year 2000 targets of 70% case detection rates and 85% treatment success rates nationally have not been found achievable.

There is obviously a need to implement the DOTS strategy more widely if there is to be any chance of achieving the global targets set for 2005 any

[1] Global Tuberculosis Control, WHO Report 1999, WHO HQ, Geneva

time soon after that year. Effective TB control would not be possible without rapidly accelerating the pace of DOTS implementation.

2. ROLE OF MEDICAL SCHOOLS

In spite of the fact that the efficacy of short-course chemotherapy has been known for decades, tuberculosis is still not diagnosed and treated properly in many parts of the world. There are many reasons for this situation. In many instances, doctors are to blame for *poor diagnosis*, e.g. inappropriate use of radiology, inadequate use of sputum microscopy and for *poor treatment*, e.g. providing regimens that are neither standard nor generally accepted, using incorrect doses of anti-tuberculosis drugs and treating for an inadequate period, failing to monitor the patient during treatment, failing to inform the patient and relatives about tuberculosis, and failing to trace household contacts of smear positive pulmonary tuberculosis. This situation is obtained both in the private as well as in the public sector.

As a result, not only are resources wasted on misdiagnosed patients, but in those patients who have tuberculosis, the inadequate use of anti-tuberculosis drugs has led to the problem of increasing drug-resistance in many countries, and, worse yet, the emergence and rise of multi-drug resistant strains of M. TB. It is, therefore, essential to improve the knowledge of doctors about tuberculosis and to train them in the skills necessary for the proper diagnosis and treatment of tuberculosis in an individual patient and in the community. The DOTS strategy will not succeed unless doctors can be trained to manage tuberculosis properly. Obviously, the active participation of doctors in tuberculosis control will lead to a change in the attitude of other health care providers and their involvement will be more easily obtained.

Medical schools must adapt and use their potential to contribute proactively to shaping the future health system. By introducing changes in medical education, research and delivery of care for tuberculosis control, medical schools have the unique opportunity to demonstrate their social accountability.

3. PRODUCING DOCTORS OF THE FUTURE

The future doctor of excellence or one with "five-star" quality should possess the following five aptitudes[2,3], and take up his/her responsibilities as a:

- ***Care provider***, who considers the patient holistically as an individual and as part of a family and a community, and who provides high quality continuing care within a doctor-patient relationship based on mutual respect and trust.
- ***Decision-maker***, who chooses which technologies to apply in enhancing care in an ethical and cost-effective fashion.
- ***Communicator***, who is able to promote healthy lifestyles by effective explanation and advocacy appropriate to the cultural and economic context, thereby empowering individuals and groups to improve and protect their health.
- ***Community leader***, who having gained local respect and trust, can reconcile individual and community health requirements and initiate action on behalf of the community.
- ***Manager***, who can work efficiently and harmoniously with individuals and organizations inside and outside the health care system to meet the needs of patients and communities.

Such a "five-star" doctor not only serves the patients and the community but also gains their respect.

To fulfill these roles, the medical school should provide every medical graduate with the knowledge, skills and attitudes essential to the management of tuberculosis in the patient and in the community as a whole. The medical school should have an effective educational strategy to provide such ability. The results of the educational process should be adequately assessed and evaluated before the medical student is allowed to graduate as a doctor.

4. WHAT SPECIFIC AND ESSENTIAL KNOWLEDGE, SKILLS AND ATTITUDES MUST BE IMPARTED?

The doctor, before he leaves medical school, should:

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2 Doctors for Health: A WHO global strategy for changing medical education and medical practice for health for all. Document WHO/HRH/96.1

3 Boelen, C., Frontline doctors of tomorrow, 1994, World Health, 5 Sept-Oct, 4-5.

(1) know about the extent of tuberculosis burden globally and in the country as well as about the national tuberculosis control policies, strategies and the programme;

(2) know the fundamental scientific facts about tuberculosis;

- biological characteristics of *Mycobacterium tuberculosis* and its appearance on sputum smear microscopy, and morphological characteristics of colonies in culture.
- histopathological and immunological changes in *Mycobacterium tuberculosis* infection and disease.

(3) know how to manage tuberculosis, specifically to:

- diagnose pulmonary TB in adults (clinically, by chest X-ray and sputum smear examination under microscopy);
- diagnose common forms of extra-pulmonary tuberculosis and childhood tuberculosis;
- treat a tuberculosis patient until cured (through the use of anti-TB chemotherapy according to national policy and the treatment category; have knowledge of the common side effects of these drugs and their management; ensure directly observed treatment; and know the criteria of treatment success, failure and relapse.

(4) know about management of household contacts of patients with smear positive pulmonary tuberculosis and about BCG vaccination recommendations in accordance with the national tuberculosis control programme policy.

A list of essential knowledge, practical skills and attitudes essential for the translation of knowledge into practice are available with WHO and can be obtained by writing to the World Health Organization, South-East Asia Regional Office, World Health House, Indraprastha Estate, New Delhi 110 002, India.

5. EDUCATIONAL STRATEGY

Having defined the required knowledge, skills and attitudes necessary for the doctor of the future in tuberculosis control, it must be defined *how, when* and *where* that education should take place. Within the constraints of available resources, the arrangement of *how, when* and *where* should be determined

by the best possible learning process: students should be in the optimal conditions and circumstances to acquire all the competencies as efficiently as possible. In the case of tuberculosis, *how, when* and *where* are *interdependent.*

Three educational options can be chosen:

- Sequential

  This has been and is the most widely used form in various medical school in India, with basic scientific and biological aspects taught in the earlier part of the curriculum. Traditionally, clinical training has come later in the student's career, and public health training provided at a separate time, early, in the middle or late. Whilst sequential training is easiest for the teachers, it can leave the student with disjointed knowledge and skills unless substantial time is devoted towards the end of the training to pull together all the various elements in a revision course.

- Fully integrated

  In this option, modular training is provided in a fully integrated manner. The biomedical and scientific elements can be integrated with clinical and public health teaching either as part of a module devoted wholly to tuberculosis or as part of a module devoted to respiratory diseases in general. Although modular training is optimal for the student, considerable reorganization and institutional change in likely to be necessary to implement such training. The resources of the medical school may not permit fully integrated modular training and a compromise may be necessary.

- Semi-integrated

  Some medical schools in India such as the All India Institute of Medical Sciences, provide integrated modular training in the fundamental biomedical subjects early in the curriculum and follow this in later years with integrated clinical and public health modules for tuberculosis. This should be considered as a transitional compromise, the optimal eventual aim being fully integrated modular training.

With each option, different approaches can be considered, e.g. plenary lectures in the classroom/lecture theatre, lectures in smaller groups, problem-solving, singly or in groups, simulation or role-playing exercises, practical work, projects, reading of textbooks or specially prepared material, audiovisual techniques, etc. Whenever possible, the approaches which favour the active participation of learners should be preferred.

The sites of learning can and should vary. The precinct of the medical school is obviously a major site, but teaching about tuberculosis should also be provided within chest and/or general hospitals, usually but not exclusively at the bedside. Students should also experience and learn about tuberculosis at sites in the community agreed upon and/or managed by the medical school, e.g. rural and urban field practice area clinics and in primary care sites, and, if possible, also in the private sector with selected general practitioners.

6. ASSESSMENT

Appropriate assessment of the students is important for at least three reasons.

(1) It is essential to make sure that at the time of graduation (and at different phases of their learning) the medical students have achieved the objectives of the course, in this case related to the management of tuberculosis in all its manifestations including when associated with HIV/AIDS.

(2) Assessments will encourage students to work harder, motivating them.

(3) Assessments can guide the teachers and the students about which parts of the course have been successful and which parts need to be improved.

Traditionally, the assessment has been achieved by examination, which is mainly centered on the assessment of theoretical knowledge. Now, it is generally agreed that examination by multiple choice questions (MCQ) is better than by the more traditional essay-type questions. However, this does not lend itself to the assessment of the practical skills. Also, in view of the need to assess attitudes and the ability of young doctors to handle persons who are suffering from the intense trauma of being diagnosed as having a stigmatizing, but curable disease. As it is envisaged that different departments and disciplines in the medical faculty will be involved in teaching the wide

variety of essential elements identified, it is inevitable that a range of student assessment methods will have to be used. Conventional essays, MCQs and MEQs all have a role, but they alone will not suffice. For tests of skills and attitudes, a variety of appropriate assessment methods need to be selected from the number of other methods that are currently available. The selection of such methods need to be based on the cardinal principles of evaluation to ensure their validity, reliability and, of course equally importantly, on the feasibility.

The Objective Structured Clinical Examination (OSCE), and the Objective Structured Practical Examination (OSPE) have many features that will help teachers to determine students' competencies, skills (including communication skills), and attitudes. However, there may be practical difficulties such as the number of students and pressure of work in the hospital which may make clinical examination as a part of final examinations difficult in some situations. Also possible are assessment of managing patient problems in the practical settings, including assessment of training in the community which should form part of final evaluation.

Another method that has found favour is a constant day-to-day evaluation (with appropriate feedback) of students as they face real and contrived experiences during the course of their training. Such continuous assessment could be best used as a method of formative assessment to promote students to learn.

Finally, it is necessary to bear in mind that no assessment method is perfect. Each has some advantages and disadvantages. Therefore, it is always necessary for the teacher to use a variety of methods whenever feasible. Such selection should be based on the objectives of the course, economy of time and expense, reliability and validity of the instruments and the value as a learning tool for the students. Variety is inevitable in view of the diverse topics being tested and because it is envisaged that many different departments of the faculty will be involved. The overall objective of producing a doctor competent and confident to handle the diagnosis, therapy and overall management of the case, family and community will be the collective responsibility of the medical school and not of any one department. However, the brunt of the responsibility will lie with the departments of microbiology, medicine and other clinical specialities and community medicine.

7. MANAGING MEDICAL EDUCATION AND PRACTICE

7.1 Tuberculosis Task Force

To respond to the urgent need for students to be properly trained in tuberculosis, a "task force for tuberculosis" should be set up in each medical school to plan a proper curriculum and teaching strategy. The task force should aim to ensure that:

(1) Essential knowledge and skills are covered by all teachers in their respective fields of tuberculosis teaching/training.

(2) Evaluation covers essential knowledge, skills and attitudes.

(3) Progress is made towards the ideal of integrated modules, which move from integrated teaching (easier for the teacher) to integrated learning (more beneficial to the student).

(4) The content of the curriculum and the systems of evaluation are updated according to priorities in the National Tuberculosis Control Programme.

The composition of the task force should be a matter for local decision, but it should certainly contain a bacteriologist, histopathologist, chest physician, internal medicine, physician, radiologist, infectious disease physician, and public health physician or official as well as a representative of the medical students.

The task force should obtain consensus within itself on what change and improvements are required. It should then strive to obtain consensus within the medical school, notably the curriculum committee.

7.2 Developing Guidelines

In providing good undergraduate training and evaluation in tuberculosis, the medical school already contributes to practice guidelines but its contribution should not stop there. Together with the National Tuberculosis Programme Managers, it should work actively with medical professional associations (private and public sector) and with local and national and international organizations (e.g. WHO) to draw up and evaluate guidelines for good medical practice in tuberculosis. NGOs, medical charitable organizations, and pharmaceutical companies should be able to assist with or contribute to the costs of printing, distributing and evaluating practice guidelines. Research

activities conducted by medical schools should be consistent with the needs of the National Tuberculosis Programme.

7.3 Continuing Education

This is currently provided to a greater or lesser extent by medical schools (postgraduate seminars, courses and diplomas), the Government Health Departments (courses and certificates) and the medical professional associations. The task force should enlist the cooperation of medical practitioners in developing a programme of continuing medical education in tuberculosis in their district/province/country. It is crucial that, as a profession, doctors should be seen to be striving to keep up-to-date and to be well informed.

Medical schools and medical professional associations should, in conjunction with schools and associations in other countries in the Region, invite experts in tuberculosis to lecture in the medical school. International health organizations such as WHO can promote this process with some funding. Pharmaceutical companies should be mobilized also to provide support to continuing education initiatives. Teachers from medical schools should have the opportunity to attend national, regional and international meetings on tuberculosis and ultimately to have a chance to spend some time in renowned tuberculosis units outside their country to exchange and share experiences.