

Knowledge of tuberculosis and its management practices among medical interns in a resource-poor setting: implications for disease control in sub-Saharan Africa

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Abstract

Of 118 medical interns, none could correctly state the estimated number of new TB cases per year in Nigeria. 88.1% knew that droplet infection was the usual mode of TB transmission. Only 27.1 % could state correctly the definition of MDR-TB while none knew the definition of XDR-TB. 62.7% identified Zeihl Neelsen staining for acid fast bacilli as the best diagnostic procedure for pulmonary TB. Only 46.6% recognized that streptomycin should not be used in pregnancy while 22.9% would isolate a child from a mother with smear positive pulmonary TB to prevent transmission. The recommended 4-drug anti-TB regimen was prescribed by 56.8% in the initiation phase and the recommended 2-drug combination in the continuation phase by 62.7%. The study reveals gross inadequacies in TB knowledge and management practices among Nigerian medical interns. There is urgent need for whole sale reform of undergraduate medical education curriculum with focal emphasis on tuberculosis and other infectious and tropical diseases.

INTRODUCTION

Tuberculosis (TB) continues to be one of the most important global public health threats. ¹ About one-third of the global population is infected with *Mycobacterium tuberculosis* and at risk of developing the disease. ^{2,3} More than eight million people develop active TB annually with more than 90% of deaths occurring in the developing world. ^{4,5} Early detection and adequate treatment are critical measures for disease control. The World Health Organization (WHO) has published guidelines for TB control in low income countries. ^{6,7} But inadequate case detection and poor treatment continue to be some of the major factors for the increasing burden of TB globally. ^{8,9} Although some studies have documented inadequate TB knowledge and poor compliance with TB treatment guidelines among practicing physicians, ^{10,11,12,13} such data are lacking in Nigeria. The objective of the study was to assess and document the knowledge of TB and its management practices among medical interns, and their adherence to the National TB Control (NTC) guidelines in Nigeria.

MATERIALS AND METHODS

The survey was conducted among 118 medical interns between December 2004 and May 2007 at Federal Medical

Centre, Ido-Ekiti, Nigeria. This is a tertiary hospital and a referral centre in the southwestern Nigeria. These medical interns, employed at various times in the above hospital, graduated within the previous 12 months before participation in the study. The authors distributed pre-tested questionnaire which were completed under supervision without allowance for discussions or cheatings. The anonymity and confidentiality of the respondents were guaranteed. The questionnaire contained a set of multiple choice questions that assessed knowledge of TB, its methods of diagnosis and management practices. It also had two subjective questions on prescription writing skills for a new case of smear positive pulmonary TB (PTB). The data were entered and analysed using Epi Info 6.04.

RESULTS

Of the 118 interns surveyed, 90 (76.3%) and 28 (23.7%) had graduated from federal- and state-owned universities respectively. At the time of the study, 30 (25.4%), 30 (25.4%), 28 (23.7%) and 30 (25.4%) interns were rotating through the departments of internal medicine, paediatrics, surgery and obstetrics, and gynaecology respectively.

KNOWLEDGE ASSESSMENT

None of the interns could correctly state the estimated number of new cases of TB per year in Nigeria (about 80,000₁₄). Droplet infection was selected as the usual mode of transmission of PTB by 104 (88.1%). Overcrowding was chosen by the remaining 14 (11.9%). Only 32 (27.1%) interns could state correctly the definition of multidrug resistant TB (MDR-TB) (resistance to isoniazid (INH) and rifampicin (RIF) with or without resistance to other first-line drugs₁₅) while none of them was aware of the definition of extensively drug resistant TB (XDR-TB) (resistance to isoniazid and rifampicin in addition to any fluoroquinolone and at least one of the three second-line injectable drugs: capreomycin, kanamycin and amikacin_{16,17}).

TB TRAINING AND EXPOSURE DURING MEDICAL SCHOOL

During their medical training, 22 (18.6%) had seen more than 50 TB patients, 63 (53.4%) between 20 and 50 patients, while 33 (30.0%) less than 20 patients. Most of the interns (91.7%) attended at least two formal sessions on chest X-rays (CXR) interpretation. While 69 (58.5%) had attended formal sessions on Zeihl-Neelsen (ZN) staining for acid fast bacilli (AFB), only 35 (29.7%) had actually done the ZN staining. Only 24 (20.3%) interns had witnessed or performed tuberculin test during their training in medical school.

DIAGNOSIS AND FOLLOW UP OF PTB PATIENTS

ZN staining for AFB was identified as the best diagnostic procedure/technique for PTB by 74 (62.7%) interns. Polymerase chain reaction was considered the best procedure by 28 (23.7%) while 7 (5.9%) thought it was CXR. Fifty five (46.6%) thought that the best test for follow up assessment of patients with PTB was ZN staining for AFB; 28 (23.7%) CXR; 19 (16.1%) erythrocyte sedimentation rate (ESR); and 11 (9.3%) tuberculin test. The remaining eleven (9.3%) interns did not choose any option. Most (91.5%) of the interns claimed that they could diagnose and manage patients with PTB on their own.

MANAGEMENT OF TB IN PREGNANCY AND POST PARTUM

On how to manage a female patient on anti-TB drugs who become pregnant, 55 (46.6%) thought that anti-TB drugs should be continued but without the use of streptomycin (SM). Another 44 (40.7%) would continue anti-TB drugs but

without INH. Sixteen (13.6%) would have withdrawn all the anti-TB drugs while none of the interns would have terminated the pregnancy. Fifty six (47.5%) of the interns felt that after delivery, the baby should have exclusive breastfeeding while 50 (42.4%) thought that the baby should be bottle fed alone without breastfeeding. Twelve (10.2%) interns said they did not know what to do. On the question about an asymptomatic infant of a mother with active PTB, 65 (55.1%) would recommend INH prophylaxis, 27 (22.9%) would isolate the child from the mother, 12 (10.2%) would hospitalized the mother until sputum conversion and 5 (4.2%) would give a full course of anti-TB drugs to the infant. The remaining 6 (5.1%) interns did not choose any option.

PATTERNS OF PRESCRIPTION OF ANTI-TB DRUGS

When responded to the question which presented a hypothetical case of a 37-year old HIV-negative Nigerian with smear positive PTB, only 67 (56.8%) prescribed the recommended four-drug regimen in the initiation phase. Forty six (38.1%) prescribed six different regimens that were neither in the NTC nor the WHO guidelines. For the continuation phase, 74 (62.7%) would use INH and RIF or ETM, while 38 (32.2%) prescribed seven different regimen not in conformity with NTC or WHO guidelines. Six (5.1%) interns did not prescribe any drugs for both phases of the treatment.

DIRECTLY OBSERVED THERAPY, SHORT COURSE (DOTS)

About the question on listing the five components of DOTS (sustained political commitment, case detection by sputum smear microscopy, uninterrupted supply of all essential anti-TB drugs, directly observed standardized treatment and efficient information system for monitoring and reporting₁₈), 72 (61.0%) could not list a single component; only 17 (14.4%) could name all the five components; while the remaining respondents (24.6%) were able to list between two to four components.

Figure 1

Table 1: Prescription pattern of anti-TB drugs by respondents for the treatment of a new smear-positive case of PTB with negative HIV serostatus

Intensive phase		Continuation phase	
Drugs	Frequency (%)	Drugs	Frequency (%)
RHZE	67	RHZ	7
RHZS	13	RHE	74
RHES	6	RES	7
RHZES	7	HT	8
RHZ	5	RHES	5
RHS	3	HE	4
RH	11	ZES	3
Not stated	6	RHE	4
		Not stated	6

R, Rifampicin, H, Isoniazid, Z, Pyrazinamide; E, Ethambutol, S, Streptomycin, T, Thiacetazone

DISCUSSION

The study revealed gross inadequacies in the knowledge of TB among medical interns. Although the dismal inability of none of the medical interns to correctly state the estimated number of new cases of TB per year is unacceptable, this might not be unconnected with the general absence of accurate data and poor record keeping culture in almost every sphere of the Nigerian state. In a study from Pakistan, poor recognition of the burden of TB and its public health significance was equally identified among medical interns in that country.¹² There was an understanding of transmission of TB but poor awareness of definitions of MDR-TB and XDR-TB. Only a paltry 16.7% of the interns could correctly define MDR-TB while none was aware of XDR-TB.

Although XDR-TB is a recent issue and was first reported in late 2005, MDR-TB was discovered in the 1990.^{13,19,20,21,22} In this survey, only 16.7% of the interns had performed ZN staining during medical training. This might be unconnected with limited laboratory capacity and dearth of health resources that are hallmarks of teaching health facilities in resource-poor countries. However, unlike the findings from some studies, majority of the interns recognized sputum smear microscopy as the best diagnostic tool for PTB.^{12,23}

The identification of smear positive TB patients and, at least, three consecutive sputum smear examination, are critical points in TB control. One of the damning revelations from the study is in the treatment of TB in pregnancy and postpartum. While less than half of interns did not know that streptomycin should not be used in pregnancy, less than a

quarter of them would isolate an infant from the mother with a smear positive PTB to prevent transmission. Most anti-TB drugs are safe for use in pregnancy with the exception of streptomycin which is ototoxic to the foetus and should not be used.²⁴ The successful treatment of TB in pregnancy with the recommended standardized regimen is important for successful outcome of the pregnancy. A breastfeeding woman who has TB should receive a full course of TB treatment.²⁴ All anti-TB drugs are compatible with breastfeeding. Timely and properly applied anti-TB treatment is the best way to prevent transmission to her baby.

There should be no isolation of the baby from the mother with breastfeeding in the normal way.²⁴ However, the child should be on INH prophylaxis for at least three months beyond the time the mother is considered to be non-infectious.²⁴ The gross ignorance about DOTS displayed in this study by medical interns was catastrophic, but subtly showed why this strategy has remained a perpetual failure in this country. Khan et al.¹² also reported similar finding in their study. Sadly, Nigeria is the most populous African nation and very critical to the control of TB in the continent, but most patients do not have access to DOTS.²⁵ The presence of free anti-TB drugs alone is not synonymous with DOTS.

The essential services needed to control TB were developed and packaged as the DOTS strategy in the early 1990s and has been promoted as a global strategy since the mid-1990s. But despite widespread acceptance of the principles of DOTS, most developing countries have failed to achieve the global target of detecting 70% of infectious cases and curing 85% of those detected.²⁶

There is deficiency in TB education in most Nigerian medical schools and affiliated teaching hospitals. This is made much worse by the absence of effective DOTS clinic in many tertiary health centres including the teaching hospitals. There is an urgent need for massive increase in awareness of DOTS among medical students and practicing medical doctors. First, federal government must enforce the establishment of strict and dedicated DOTS clinic in all tertiary hospitals. Second, medical students must rotate through DOTS clinic and practically participate in all its activities, including performance of ZN staining for sputum smear microscopy.

Lastly, all medical interns must also rotate through a DOTS clinic during their training. The revision of existing medical

education curriculum in Nigeria should focus on incorporation of national TB guidelines into TB teachings in schools. The appropriate authority should ensure the circulation and availability of TB guidelines to every practicing medical doctor in the country. This will encourage medical practitioners to inculcate diagnostic and prescription practices that are in accordance with the national TB guidelines.^{27,28}

CONCLUSION

The study has shown gross deficiencies in medical education in Nigeria, one of the countries with the largest numbers of TB cases. This is, no doubt, an enormous challenge not only to the effective control of TB in Nigeria, but also in the whole of Africa. There is urgent need to revamp and reform undergraduate medical education curriculum with focal emphasis on tuberculosis and other infectious diseases. Nigeria, as a TB heavy-burdened state, can not afford to be negligent in her medical education of TB and the training of medical doctors in its management. The results of this study portend a great danger for the control of TB in sub-Saharan Africa. We recommend that similar studies should be carried out in other countries with heavy burdens of TB.

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