



Pulmonary Tuberculosis Among Health Care Workers In Ibadan, Nigeria



Aderemi Kehinde*, Abubakar Baba*, Rasheed Bakare*, Olusoji Ige#, Comfort Gbadeyanka+, Oludele Adebisi*

Affiliations: Departments of *Medical Microbiology and Parasitology, #Internal Medicine, College of Medicine, University of Ibadan, Nigeria and +Jericho Chest Hospital, Ibadan, Nigeria.

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Introduction

- There is scarcity of information on transmission of *Mycobacterium tuberculosis*, the aetiological agent of tuberculosis (TB) to Health-care workers (HCWs) in many of the TB endemic countries of sub-Saharan Africa including Nigeria.
- In Nigeria however, the main target of the National TB Control Program was to attain the World Health Organization's target of achieving 70% case detection rate and 85% cure rate.
- At present, Nigeria has 23% detection rate and 76% treatment success rate (WHO report, 2009).
- As a result of this, TB infection control strategy is not given adequate attention in the country.



Objectives



- To determine the prevalence of occupationally-acquired pulmonary tuberculosis (PTB) in Ibadan, Nigeria.
- To create a baseline data for designing and implementing TB infection control policy in Nigeria.



Methods (1)



- This was a descriptive epidemiological study in which Health Care Workers (HCWs) (physicians, nurses, radiographers, laboratory scientists, laboratory assistants, ward maids and students) who were involved in the management of TB patients were screened for PTB.
- This six month study (January-June, 2008) was carried out at two designated DOTS centers, the University College Hospital (UCH), Ibadan, a tertiary health care facility and Jericho Chest Hospital (JCH) which serves as referral secondary health care center.
- The study protocol was approved by the University of Ibadan and UCH joint ethical committee.
- Informed consent was obtained from the participants before enrollment into the study. Those who refused to give written consent were excluded.
- A pre-tested questionnaire was used by a trained counselor to obtain information on demographic characteristics, social and medical history from the subjects. Other important information about PTB such as previous BCG vaccination, contact with an index case and exposure to tuberculin skin test were also obtained.



Methods (2)



- Three early morning sputa were collected from each participant. The samples were processed at the TB laboratory of the department of Medical Microbiology and Parasitology, UCH.
- Each sample was stained with Zeihl-Neelson (Z-N) reagents (hot method). The staining procedure was controlled by using known acid-fast bacilli (AFB) slide and slide stained with egg albumin as positive and negative controls respectively.
- Thereafter, the sputum was decontaminated using 4% NAOH. The resulting solution was mixed using vortex mixer. About one ml from the mixture was inoculated onto prepared modified Ogawa egg medium and incubated at 37°C for six weeks. *M. tuberculosis* strain H37RV and sterile Ogawa medium were used as positive and negative controls respectively.
- Contamination on Ogawa medium was determined by looking for growth before three weeks of incubation and by carrying out Z-N reaction and standard biochemical tests.



Results (1)



- A total of 271 subjects, 117 (43.2%) males and 154 (56.8%) females were studied. Only four (1.5%) were over 60 years old while the majority, 151 (55.7%) were aged 21-40 years. Of the subjects, 102 (37.6%) were professionals while non-professionals accounted for 169 (63.4%).
- The majority, 160 (59.0%) have been working in their units for more than two years while 64 (23.6%) have not spent up to one year in their various units. Most (93.7%) reported negative history of chronic cough while a higher percentage (94.8%) denied any history of smoking.



Results (2)



- Nine (3.3%) of the 271 subjects had their sputum positive for AFB, six (2.2%) were positive for culture while five (1.8%) were contaminants.
- All the six culture positive isolates were also AFB positive.
- Eight out of nine AFB positive samples were obtained from participants aged 21-60 years while only one was from adolescent age group. The association between AFB positivity and age of the subjects was not statistically significant ($\chi^2 = 0.92$, $p = 0.52$).
- Of the AFB positive sputum, four (44.4%) were from males while females accounted for five (55.6%). Also, association of AFB positivity by sex of subjects was not statistically significant ($\chi^2 = 0.01$, $p = 0.94$).
- On the other hand, significantly, all the six culture positive samples were from males while none was obtained from their female counterparts ($\chi^2 = 8.08$, $p = 0.02$).
- Furthermore, more than three quarters (77.7%) of the positive samples (either by AFB or culture or both) were from students, 22.3% were from ward maids while none was obtained from the professionals.



Discussion & Conclusions



- The risk of transmitting *M .tuberculosis* from PTB patients to HCWs is a neglected problem in low-income countries with high burden of TB.
- The infection rates of 3.3% by AFB and 2.2% by culture obtained from this study is in keeping with what were obtained in other parts of Africa with high burden of the disease (Gilpin et al, 1987; Claessens et al, 2002).
- Occupationally-acquired PTB is real in Ibadan, Nigeria especially among unskilled HCWs.
- Plans should be put in place to prevent transmission of TB from infected patients to HCWs in Nigeria.



Future perspectives



- The National TB Control Programme in endemic countries should find ways of incorporating TB infection control interventions into their DOTS programme in order to prevent occupationally-acquired TB.



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