

HOSTED BY

Available at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/IJMYCO

Tuberculosis at post-mortem in inpatient adults at a tertiary referral centre in sub-Saharan Africa – A prospective descriptive autopsy study

Matthew Bates ^{a,b,*}, Victor Mudenda ^c, Aaron Shibemba ^c, Jonas Kaluwaji ^b, John Tembo ^b, Mwila Kabwe ^b, Charles Chimoga ^b, Lophina Chilukutu ^b, Moses Chilufya ^b, Nathan Kapata ^d, Michael Hoelscher ^{e,f}, Markus Maeurer ^{g,h}, Peter Mwaba ^b, Alimuddin Zumla ^{a,b,i}

^a Department of Infection, Division of Infection and Immunity, University College London, United Kingdom

^b University of Zambia and University College London Medical School (UNZA-UCLMS) Research and Training Project, University Teaching Hospital, Lusaka, Zambia

^c Department of Pathology & Microbiology, University Teaching Hospital, Lusaka, Zambia

^d National Tuberculosis Control Programme, Ministry of Community Development, Maternal and Child Health, Lusaka, Zambia

^e Division of Infectious Diseases and Tropical Medicine, Medical Centre of the University of Munich, Munich, Germany

^f University of Munich, Munich, Germany

^g Therapeutic Immunology, Department of Laboratory Medicine, Karolinska Institute, Stockholm, Sweden

^h Therapeutic Immunology, Department of Microbiology, Tumour and Cell Biology, Karolinska Institute, Stockholm, Sweden

ⁱ NIHR Biomedical Research Centre, University College London Hospitals, London, United Kingdom

ARTICLE INFO

Article history:

Received 28 October 2014

Accepted 29 October 2014

Available online 22 December 2014

Keywords:

Autopsy

Post-mortem

Adults

Tuberculosis

Inpatients

Respiratory tract infections

Sub-Saharan Africa

WHO

ABSTRACT

Background: The World Health Organisation (WHO) estimates that 3 million cases of tuberculosis (TB) are missed every year. Identification and treatment of these are critical to achieving global TB control. Patients with sub-clinical TB, extra-pulmonary TB, and drug-resistant TB are difficult to diagnose and may be missed at all points of healthcare. An autopsy study was conducted to ascertain the burden of TB at post-mortem in adults who died in the inpatient general medical wards at a tertiary care referral center in Lusaka, Zambia.

Methods: Complete whole body autopsies were performed on 125 adult inpatients. Pathological examination involved two stages: (1) Gross pathology was recorded, and samples were taken from all organs for histopathology and cryopreservation; and (2) Histopathological examination of tissue after appropriate staining. Specific pathology and diseases identified on examination were recorded. Lung tissues were processed using the GeneXpert MTB/RIF Assay. Primary outcome measures were specific diseases stratified by HIV status. Secondary outcomes were missed TB and drug-resistant TB cases.

Findings: Of 125 adults, median age 35 years (IQR: 29–43), 80 (64%) were male and 101 (80.8%) were HIV-positive. Tuberculosis was the most common finding at autopsy with 78/125 cases (62.4%), of which 66/78 (84.6%) were HIV-infected. There were 35/78 cases (44.9%) with extra-pulmonary TB, the odds of which were higher among HIV-infected cases (aOR 5.14 (95% CI: 1.04–25.4), $p = 0.045$); 25.6% (20/78) of the TB cases were not diagnosed ante-mortem; and

* Corresponding author at: University of Zambia and University College London Medical School (UNZA-UCLMS) Research and Training Project, University Teaching Hospital, Lusaka, Zambia.

<http://dx.doi.org/10.1016/j.ijmyco.2014.10.054>

2212-5531/© 2015 Published by Elsevier Ltd. on behalf of Asian-African Society for Mycobacteriology.

13/78 (16.7%) of the TB cases had undiagnosed MDR-TB. Other autopsy findings included: pyogenic pneumonia 36.8% (46/125); bacterial meningitis 7.2% (9/125); cardiac failure 7.2% (9/125); and malignancies 8.8% (11/125). Prevalence of HIV did not differ between TB and non-TB cases (84.6% vs. 74.5%; $p = 0.163$).

Interpretation: TB remains an important cause of death in adult inpatients. A substantial number of inpatients with TB and MDR-TB are not diagnosed by the current cascade of healthcare. Inpatient settings in high TB endemic countries should be included in WHO 'high risk' groups, and heightened clinical awareness and more proactive screening for TB and MDR-TB in all inpatients should be required.

© 2015 Published by Elsevier Ltd. on behalf of Asian-African Society for Mycobacteriology.
