

# Assessment of the Survival Status and Risk Factors for the Mortality among Multidrug Resistant Tuberculosis Patients at Adama and Bishoftu General Hospitals, Oromia, Ethiopia: A Retrospective Cohort Study

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## Abstract:

**Background:** Multi-drug resistant tuberculosis is a widespread global problem. The magnitude of this disease varies significantly from country to country and the treatment outcomes are inadequately described in Ethiopia. Objective: To assess the survival status and risk factors for mortality of multidrug resistant tuberculosis patients at Adama and Bishoftu General Hospitals in Ethiopia.

**Methods:** Retrospective cohort study design was conducted among multidrug resistant tuberculosis patients treated from May, 2013 to August, 2017 at Adama and Bishoftu General Hospitals. Data were collected using standardized data abstraction format. Data were analysed using STATA Version 13 statistical software. Risks were estimated for the entire follow-up time corresponding to each event occurrence using Kaplan-Meier method and the covariates were fitted to Cox Proportional Hazard Regression Model.

**Result:** Among 164 patients, 74 (45.10%) were male and the mean age was 31.5 years. The participants were followed for a total of 63,141 person-days. The median survival time was 400.5 days. There were 30 (18.30%) known deaths and the survival probability of the study participants at 6, 12, 18 and 24 months of treatment was 84%, 82%, 81% and 72%, respectively. The Cox regression analysis showed that factors independently associated with mortality of patients were: HIV (AHR=2.75, 95% CI(1.23-6.15); low initial body weight(HR=0.44,95% CI (0.22-0.85); co-morbidities and co-infections (AHR=2.28, 95% CI (1.99-5.26); age (AHR=2.26 ,95% CI (1.35-3.79); and Khat use (AHR=0.41, 95% CI (0.18-0.97).

**Conclusion:** A lower survival time was found with declining probability of survival across duration of treatment. Higher mortality rate was noted in patients who started MDR-TB treatment with initial low body weight,

HIV positive, co-morbidities and co-infections and Khat user

## Keyword:

Multidrug resistant tuberculosis; Rifampicin resistant; Survival probability; Isoniazid resistant; Treatment outcome, Risk factors

## Abbreviation:

MDR-TB: Multi-Drug Resistant Tuberculosis; TB: Tuberculosis; R: Rifampicin; RR: Rifampicin resistance; H: Isoniazid

## Introduction:

Multidrug Resistant Tuberculosis (MDR-TB) is tuberculosis caused by *Mycobacterium tuberculosis* that does not respond to at least isoniazid and rifampicin [1,2]. It could be new TB cases (primary infection) or resistance may develop while the patient is on course of TB treatment mainly due to human error, major predictor being treatment nonadherence [2]. According to WHO 2017 Global TB report, estimated MDR-TB incidence is 4.1% in new TB patients and 19% in previously treated TB cases globally. According to this report Ethiopia is among the top 20 countries with high MDR-TB burden with overall incidence of 5.7% (3.0%-8.3%) of MDR/RR-TB infection. The estimated incidence is 2.7% (1.5%-4.0%) in new TB cases and 14% (3.5%-25%) in previously treated cases [3].

## Study design and study population

Retrospective cohort study design based on the patient chart review was conducted among MDR-TB patients who were on second-line treatments from May 2013 up to August 2017 at Adama and Bishoftu General Hospitals. The study population included all bacteriologically confirmed and clinically diagnosed MDR-TB patients who were on second line antiTB treatment at Adama and Bishoftu General Hospitals. All other TB patients (susceptible TB or XDR-TB) were excluded in the study. Considering the numbers of patients in the two hospitals were small, all the patients who started MDR-TB treatment were included in the study to increase the precision of the result. There was a total of 164 eligible MDR-TB patients treated in both hospitals, among which 145 were from Adama general hospital and the rest 19 were from Bishoftu general hospital.

## Ethical consideration:

The Ethical clearance to conduct the study was obtained from Ethical Review Board of School of Pharmacy, Addis Ababa University (Ref: ERB/SOP/22/09/2017). The permission to conduct research was also obtained from Directors of Adama and Bishoftu General Hospitals. Confidentiality of patient data was assured by coding the

personal identifiers of patients. In addition, data collectors were nurse professionals working in the specific centre to avoid external person from accessing patient data.

### **Conclusion:**

The mortality among MDR-TB patients was high. The major risk factors for mortality of MDR-TB patients were initial low body weight, HIV positive status, co-morbidities and co-infections, age and Khat

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