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Modeling TB-free survival among HIV patients on art in Alert Zewditu Memorial Hospitals Addis Ababa, Ethiopia

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Background: Tuberculosis (TB) is one of the most common causes of morbidity and mortality among HIV+ patients living in low-income countries. HIV increases the risk of progression from latent TB infection, early infection or re infection to active disease. TB is the most common presenting illness and death among people living with HIV, including those who are taking ART and it is accounting for one in five HIV-related deaths globally and Africa remains the most severely affected by the dual epidemic. This study was undertaken to model TB free survival among patients on ART and to identify factors that have strong association with TB free survival in ALERT and Zewditu Memorial Hospitals, Addis Ababa, Ethiopia.

Objective: The main objectives of this study was to model and analyze survival end points and identify factors with strong association on TB free survival of patients on ART follow-up based on a retrospective data from patient records at ALERT and Zewditu Memorial Hospitals, Addis Ababa, Ethiopia.

Methods: The data were retrospectively collected from a cohort of patients on ART follow up from January 2011 to December 2016 from ALERT and Zewditu Memorial Hospitals, Addis Ababa, Ethiopia. The total estimated sample size was 784 and proportionally allocated for the two study site based on the available number of eligible clients in each study site. The survival data were extracted from the patient's card and electronic database using standard questionnaire which contains demographic and laboratory information of all patients on follow up. Semi-parametric (Cox) proportional hazards models and parametric survival (Accelerated Failure Time (AFT)) Models were fitted to explore factors that have strong association on TB free survival. All inferences made at a 5% significance level. Statistical analysis was done using SAS version 9.4 and R version 3.4.0.

Results: Gamma AFT model was used to fit the data set. A total of 784 participants 77(9.82%) developed tuberculosis in the study period. TB free survival was 0.896 (0.872, 0.916). Cumulative TB incidence rate was 19.3 cases per 1,000 person per year. TB free survival was associated with age, opportunistic infection, baseline CD4 count and years on ART. TB free survival was higher on patients ART>10 years than <5 years 31.27% [0.6873, (0.6240, 0.7570)]. Patients with a CD4 count< 200 cell/mm2 had lower TB free (31.65%) survival than CD4 count > 500 cell/mm2 [0.6835, (0.5948, 0.7852)].

Conclusion: TB incidence rate was lower and TB survival was relatively good. TB free survival was inversely related as the age of the patient increased and as CD4 count became <200cell/mm2, and increased as years on ART increase.

Recommendations: Screening of patients for opportunistic infections periodically, particularly for patients whose CD4 count is < 200 cell/mm2 for TB and appropriate documentation of their status is important.

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