Mortality following diagnosis of tuberculosis in HIV-infected patients in Asia

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Tuberculosis (TB) is highly prevalent in the Asia-Pacific region, accounting for 61% of estimated cases globally in 2015. To further expand on available data around TB coinfection and associated treatment outcomes in HIV-infected patients in Asia [1], we investigated survival outcomes in HIV-positive TB-coinfected patients.

HIV-positive TB-coinfected cases were selected from those who were recruited into TREAT Asia’s study of socio-economic determinants of TB in HIV/TB-coinfected patients in Asia [2]. Survival time from TB diagnosis was plotted using the Kaplan–Meier (K–M) curve and analysed using Cox regression. Ethics approvals were obtained from the local ethics committees of all participating sites, the data management and biostatistical centre (UNSW Sydney Ethics Committee), and the coordinating centre (TREAT Asia/amfAR). Written informed consent was obtained from the participants. All data management and statistical analyses were performed using SAS software version 9.4 (SAS Institute Inc., Cary, NC) and STATA software version 14.2 (Stata Corp., College Station, TX).

A total of 146 TB-positive cases from China, Hong Kong SAR, Indonesia, Malaysia, the Philippines, Singapore, Taiwan, Thailand, and Vietnam were included. There were 20 deaths (14%). The median follow-up time from TB diagnosis was 238 days [interquartile range (IQR) 182–285 days]. The overall mortality rate was 21.5 per 100 person-years (PY). The median age at enrolment was 33 years (IQR 29–38 years) and the median CD4 cell count was 40.5 cells/μL (IQR 13–87 cells/μL). There were 122 (84%) male patients.

The K–M curve (Fig. 1) shows the survival probability dropping to 80% at 1 year from TB diagnosis. Factors associated with survival time in the univariate model were antiretroviral treatment (ART) initiation (P = 0.014), place of origin (P = 0.071), employment status (P = 0.006), and smoking history (P = 0.066). In the multivariate model adjusting for ART, we found that patients in part-time or occasional employment had a higher hazard for mortality compared with patients who were in full-time employment [hazard ratio (HR) 4.55; 95% confidence interval (CI) 1.51–13.73; P = 0.010]. Those who had ceased smoking showed improved survival compared with those who were current smokers (HR 0.22; 95% CI 0.07–0.70; P = 0.010).

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Fig. 1 Survival time from tuberculosis (TB) diagnosis.
The mortality rate in our study is considerably higher than the mortality rates reported in previous studies from the same region, which ranged from 1.46 to 3.77 per 100 PY [1,3]. The large difference could be attributable to the short follow-up time, which is a limitation of our study. Other regions, however, have reported high short-term mortality rates similar to our findings [4,5].

Apart from employment status and smoking history, which are known risk factors for TB and poor TB treatment outcomes [5], we did not find a significant association between the available demographic or clinical characteristics and survival time.

In summary, mortality in HIV-positive TB-coinfected patients enrolled in our study was high but comparable to rates reported across different regions. Patients should be closely monitored in the first year following TB diagnosis.

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Appendix 1: TB socio-economic determinants study members

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