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Screening new tuberculosis patients in Mali for rifampicin resistance at 2 months

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ABSTRACT

Objective/background: The recent call for universal drug susceptibility testing (DST) for all tuberculosis (TB) patients will be difficult to meet in settings where Xpert rollout is limited, such as low prevalence of HIV and Multi-drug Resistant Tuberculosis (MDR) settings. As recommended by World Health Organization (WHO) guidelines, the success of TB treatment is measured by Ziehl–Neelsen (ZN) microscopy or auramine–rhodamine fluorescent microscopy (FM) on sputum, in which conversion to negative smear at 2 months (M) is an important predictor of treatment success, defined as a negative smear at 5 M. The sputum smear that fails to convert to negative at 5 M are screened for rifampicin resistance. We tested in a prospective study whether an early screen for rifampicin resistance, based on FM results at 2 M, could detect MDR patients early, rather than screening all patients with GeneXpert MTB/Rif at baseline.

Methods: Between February 2015 and August 2016, we enrolled new TB patients in an IRB-approved prospective cohort study at four health centers in Bamako district. Fresh sputum samples were collected at 2 M and 5 M to measure FM smear conversion. Patients who failed to show a decline in FM positivity at 2 M (moderate or many Acid Fast Bacilli (AFB)) had their sputum tested in GeneXpert to detect rifampicin resistance. Patients who had any AFB seen at 5 M were also tested using GeneXpert.

Results: Of the 570 patients who were enrolled in the study, 22 (3.8%) died and 27 (4.7%) were lost to follow-up. The prevalence of HIV and TB coinfection was 12.4%, and 65.6% of the patients were male. At 2 M, 32 out of 429 patients still had moderate or many AFBs in FM, and were screened by Xpert, of whom 5 (15.6%) tested rifampicin-resistant and were referred for MDR treatment. Of the 310 patients who completed 5 M of treatment, 35 (11.3%) met the definition of failure (few or moderate AFB in FM) and had their sputum tested in Xpert; moreover, four (11.4%) demonstrated rifampicin resistance. In total, 67 (21.6% of

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310) patients were screened by Xpert, of whom nine were detected to have MDR (or 13.4% of those screened).

Conclusion: Although we cannot exclude additional MDR patients having been missed by our screening strategy, our screening algorithm at 2 M detected five out of nine MDR patients. Detecting patients at 2 M allowed for earlier referral, and potentially less acquired drug resistance and lower mortality. This strategy may be advantageous while awaiting further rollout of Xpert machines that will permit universal DST.

Conflicts of interest

All authors declare no conflicts of interest.

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