Impact of Sputum Transit Time on TB Isolation and Culture Contamination Rate

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Tuberculosis (TB) culture is the gold standard for the diagnosis of *Mycobacterium tuberculosis* (Mtb) and enables full drug susceptibility testing. However, culture contamination remains a challenge in TB culture resulting to significant loss of time and resources and potentially, poor treatment outcomes on account of incorrect clinical decision-making. The purpose of this study is to assess the effect of sputum transit time on contamination rate and the yield of Mtb. We conducted a retrospective analysis of all samples received for TB culture at a Reference Laboratory, from January to December 2021. Samples were decontaminated by using the standard N-Acetyl L-cysteine (NALC)/Sodium Hydroxide (NaOH) method to process the sputum samples and inoculated on solid media. The number of days from sample collection to processing was documented for all 988 valid samples received within the study period. We conducted univariable logistic regression to explore the relationship between transit time and contamination rate. We report percentages, and Odds ratios with associated 95% confidence intervals. Of 988 diagnosis and follow-up samples received, 508 (58.7%) were from males while 14 (1.4%) were from children (≤ 14y). Overall, 56 samples were contaminated of which 17 were positive on AFB. A contamination rate of 4.1%, 7.1% and 8.3% were recorded for Optimal (0-7 days), Delayed (8-14 days), and Extended delay (>15 days) samples respectively. Compared to samples analyzed within optimal transit time, those with Delayed and Extended delay transit times had greater odds of being contaminated with OR of 1.811 (0.997-3.290) and 2.148 (0.983-4.688) respectively. The study revealed that TB culture contamination rate tends to increase with number of days taken for sample movement from collection to processing. However, the association detected fell slightly short of achieving statistical significance. It is also instructive that about one in three samples that were contaminated (17/56) was positive on AFB which could have far-reaching implications for the clinical decision-making and management of persons being treated for various forms of TB. Investment in innovative approaches to ensure that all samples for TB culture reach the testing labs within the optimal period are likely to save time, resources, and lives.