Clinical Application and Evaluation of EQUI-TB tuberculosis Rapid Test

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Objective: The diagnosis of tuberculosis (TB) mainly relies on acid-fast staining of sputum smears, chest X-ray inspection, and mycobacterial culture. However, sputum smear has low sensitivity, while the chest X-ray inspection lacks specificity. Therefore, traditional mycobacterial culture followed by biochemical identification is used as the diagnostic standard. Even so, the traditional culture process takes four to eight weeks. To circumvent this problem, rapid identification and diagnosis methods, such as the EQUI-TB Tuberculosis Rapid Test, were developed. This study aimed to assess the clinical applicability of EQUI-TB Tuberculosis Rapid Test. A total of 42 serum samples collected from 32 patients with Mycobacterium tuberculosis complex (MTBC) infection and another 10 patients with non-tuberculous mycobacteria (NTM) infection were retrospectively collected and analyzed. In addition, 10 serum samples obtained from patients without TB infection. Culture and acid-fast staining results were used for comparison. Among the 32 TB-positive serum samples, 16 were detected as positive via the EQUI-TB. In contrast, serum samples obtained from the 20 TB-negative patients all produced negative results. The EQUI-TB Rapid Serum Test showed a sensitivity of 50%, specificity 100%, positive predictive value 100%, and negative predictive value 56%. The overall assessment effectiveness was 69%. Besides, in comparison with acid-fast staining method, EQUI-TB Rapid Serum Test showed a sensitivity of 44%, specificity 90%, positive predictive value 88%, and negative predictive value 50% with overall assessment effectiveness of 62%. The EQUI-TB Tuberculosis Rapid Test appears to distinguish NTM from MTBC very efficiently and is easy to operate. Therefore, the method may be used as an auxiliary tool for TB diagnosis in clinical laboratories. In this study due to limited sample size, may be to increase the number of test specimens in future research to obtain more powerful results.

Key words: Mycobacterium tuberculosis, Mycobacterium, Evaluation, EQUI-TB Tuberculosis Rapid Test