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Clinical, radiological and laboratory predictors of positive urine lipoarabinomannan in sputum scarce and sputum negative patients with HIV associated TB in two Johannesburg Hospitals

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ABSTRACT

Background

Tuberculosis is a major cause of mortality in HIV-infected patients. The diagnosis of TB in patients with low CD4 counts using sputum-based diagnostics is hampered by paucibacillary disease with these patients often being sputum negative or sputum scarce. Urine lipoarabinomannan (LAM) has shown promise in point of care detection of TB in this patient subset but it lacks sensitivity and its exact role in a diagnostic algorithm for TB in South Africa remains to be elucidated.

Methods

This multicentre retrospective record review compared the clinical, radiological and laboratory characteristics of sputum scarce or sputum negative HIV infected patients in two hospitals who underwent urine LAM testing in line with WHO recommendations.

Results

Over a third of patients (35%) had a positive LAM, with a higher yield in sputum scarce patients (42 vs 30%, p = 0.0141). These patients were more likely to have delirium (OR 2.2, 95% CI 1.2 - 3.7), a higher median heart rate (p=0.0135) and a qSOFA score ≥ 2 (OR 3.5, 95% CI 1.6 – 7.6). A positive LAM was significantly associated with the presence of disseminated TB (p < 0.0001) . It was also associated with a clinical diagnosis of TB immune reconstitution syndrome (p=0.0035) and abdominal TB (p<0.0001). Laboratory predictors of a positive LAM included renal dysfunction (p=0.044), severe anaemia (p = 0.0116) and a higher median C-Reactive protein (p=0.0131). Positive LAM results were also noted in 75% of patients with disseminated non-tuberculous mycobacterial infections (p=0.0053).

Conclusion

Urine LAM testing for TB had significant diagnostic utility in HIV infected inpatients that were sputum scarce or sputum negative. A positive LAM was associated with disseminated disease, several markers of severe illness, and the diagnosis of TB IRIS. Disseminated non-tuberculous mycobacterial infection may result in positive urine LAM results. Select use in these patient subsets could maximise yield and improve predictive value, in addition to improving the time to diagnosis.

Keywords: HIV, TB, Lipoarabinomannan, Sputum negative, Sputum scarce