
Accuracy of Indian ink staining in diagnosis of cryptococcal meningitis in HIV infection in Jos, Nigeria

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Cryptococcal meningitis (CM) is an important cause of morbidity and mortality in patients with AIDS, and is widely considered as the most common life-threatening AIDS related fungal infection¹. Prompt diagnosis and treatment of CM is paramount as it carries 100% mortality without treatment². Indian ink stain of the Cerebrospinal Fluid (CSF) is a simple, inexpensive side laboratory test that is widely available in resource poor settings for rapid diagnosis of CM. We determined the accuracy of Indian ink stain in the diagnosis of CM.

Methodology

This was a cross-sectional study in which One hundred (100) confirmed HIV 1 patients admitted in the Jos University Teaching Hospital (JUTH) with features of meningitis or meningo-encephalitis were consecutively enrolled. Lumbar puncture was done to collect CSF which was subjected to Indian ink staining and fungal culture using Sabouraud dextrose agar as the reference test. Blood was also collected for CD4+ count determination using flow cytometry (Partec Muster Germany).

Results

Among the 100 patients suspected to have CM, India ink was positive in 60 (60%) patients while fungal culture was positive in 36 (36%). The sensitivity and specificity of Indian ink were 100% and 62.5% respectively. The positive predictive value (PPV) was 60% and negative predictive value (NPV) was 100%. The Indian ink stain and fungal culture were in moderate agreement (Kappa ratio 0.545). The mean CD4+ count of the culture positive cases was 89 ± 60 cells/mm³ with a median of 82 cells/mm³.

Table 1. Comparison of fungal culture by Indian ink staining.

	Fungal culture			
Indian Ink	Positive	Negative	Total	
Positive	36	24	60	PPV=60%
Negative	0	40	40	NPV=100%
Total	36	64	100	
	Sensitivity=100%	Specificity=62.5%		

Conclusion

Whereas Indian ink stain is useful as a screening test, it has a low confirmatory test value for CM in patients with HIV and may lead to over-diagnosis of CM. Positive Indian ink test should be confirmed by culture.

References

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