Performance of the Biofire Filmarray Meningitis/Encephalitis Panel in Cryptococcal Meningitis Diagnosis

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Background
Cryptococcal meningitis (CM) is a cause of subacute meningitis in immunocompromised patients. Clinical history, presentation, and routine laboratory testing are often not specific for the disease, making CM difficult to diagnose without a high index of clinical suspicion. Diagnosis is made using the CSF cryptococcal antigen (CrAg) and CSF fungal culture.

The BioFire Filmarray Meningitis/Encephalitis panel is a multiplex polymerase chain reaction assay which can be used as a qualitative diagnostic test to identify a variety of bacterial, viral, and fungal causes of meningitis, including Cryptococcus neoformans.

Results

Positive Cryptococcal testing

n = 14

ME positive
n = 5

Culture positive
n = 5

Culture positive
n = 2

ME negative
n = 9

Culture negative
n = 7

Demographics
Male, % (no.) 86 (12/14)
Age y, M (IQR) 44 (36.4-55.8)
HIV+, % (no.) 86 (12/14)
CD4 cell count/µL, M (IQR) 58 (26-121)
Culture positive CM, % (no.) 50 (7/14)
Initial diagnosis, % (no.) 29 (4/14)
Prior positive CSF CrAg, % (no.) 71 (3/14)
Clinical presentation
Headache, % (no.) 57 (8/14)
Encephalopathy, % (no.) 50 (7/14)

CSF results
WBC count/µL, M (IQR) 50 (8.5-179)
Opening pressure cmH2O, M (IQR) 21 (14.5-24.3)

Table 2: Patient demographics and CSF results of 14 distinct encounters. *n=12, two patients with no recorded opening pressure. M, median. IQR, interquartile range

Results continued

• Chi square analysis comparing ME panel to CSF culture was used to assess the diagnostic performance of the ME panel (Table 2).

• Two patients were ME panel negative and CSF culture positive. Both patients were HIV positive with a history of CM based on a prior positive CSF CrAg and had received induction therapy.

Table 2: Sensitivity and specificity (%) of the ME panel for detection of symptomatic cryptococcal meningitis. *Clopper Pearson exact confidence intervals.

Conclusions

• Recent studies have suggested a role for the ME panel in diagnosis of recurrent cryptococcal disease. In contrast, our study shows that a negative cryptococcal ME result should not be used to rule out disease, particularly in patients with a previous diagnosis of CM.1

• Rapid diagnostic testing for cryptococcal meningitis remains an adjunct to fungal culture but does not replace the need for fungal culture in patients at risk for the disease.2

• Further studies may be helpful in determining if the ME panel performance is affected by previous therapy.

References