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Bacterial Antigen Detection Testing of Cerebrospinal Fluid

Bacterial antigens will no longer be offered on our test menu. We will continue to offer a cytocentrifuged Gram stain with backup culture for the diagnosis of bacterial meningitis. The effective date of this change will be June 1, 2001.

Bacterial antigen detection tests have long been used as an adjunct to other laboratory tests for the diagnosis of bacterial meningitis. Their putative advantages were the rapid and definitive detection of the presence of *Haemophilus influenzae, Neisseria meningitidis, Streptococcus pneumoniae,* and *Streptococcus agalactiae* (Group-B strep) in patients with meningitis. Although the tests were highly sensitive and specific for the detection of *H. influenzae* in CSF, their sensitivity was lower for the other organisms and poor for *N. meningitidis.* Moreover, their sensitivity was essentially identical to that of the Gram-stained smear of a cytocentrifuged CSF specimen (i.e. approximately 10^4 organisms per milliliter). In addition, they are not particularly rapid tests (1-2 hour turnaround times) and they are expensive.

In recent years, numerous studies in both pediatric and adult populations have assessed the clinical impact of bacterial antigen tests on the management of patients with suspected meningitis. In the most comprehensive of these studies, Perkins and coworkers (1995) examined the results of testing over 5000 specimens –mostly CSF and urine– and found that 31 of the 57 positive specimens (54%) were false positives. Of the 7 positive CSF specimens, only 5 were true positive, but of the 49 positive urine specimens, only 16 were true positive. There was no demonstrable clinical impact of a positive test on patient management in any of the 22 patients with true positive tests. *There were no positive antigen tests in specimens from patients whose cultures were presumed to have been negative on the basis of prior antimicrobial therapy. All antigen positive CSF specimens had positive Gram stains.* All infants with true positive group B streptococcal antigen tests of urine were being treated for suspected group B streptococcal meningitis or sepsis, and all had positive blood and amniotic fluid cultures. In addition to the large number of false-positive specimens, which resulted in the administration of inappropriate therapy and unnecessary prolonged hospitalizations, another 7% of positive tests were of indeterminate significance.

The findings of the of this and other studies, the expense of the test, and the problem of false positive results seriously limit the usefulness of this test.

REFERENCES:

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