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Discontinuation of the BAD Test for the Diagnosis of Bacterial Meningitis

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Effective February 1, 2011, the Bacterial Antigen Detection (BAD) test will not be offered by the Microbiology department of Laboratory Alliance of Central New York. The Microbiology department will continue to perform a centrifuged Gram-stained smear and bacterial culture on cerebrospinal fluid (CSF) specimens for the laboratory diagnosis of bacterial meningitis. In addition, the BAD test will not be available as a send out test to our reference laboratory because they have discontinued performing the BAD test as well. The decision to discontinue this test service is based upon the results of several published scientific studies that are briefly described below.

Since the early 1980s, the BAD test has been used as an adjunct to other laboratory tests for the diagnosis of bacterial meningitis. The reputed advantages of the test were the rapid and definitive detection of the more common serotypes of *Haemophilus influenzae*, *Neisseria meningitidis, Streptococcus pneumoniae*, and *Streptococcus agalactiae* (group B strep) that were the leading causes of bacterial meningitis. Although the test was highly sensitive and specific for detecting *H. influenzae* type b antigen in CSF specimens, its sensitivity was considerably lower for many of the other organisms and very poor for *N. meningitidis*. Equally important, the sensitivity of the BAD test was essentially identical to that of a Gram-stained smear of a centrifuged CSF specimen (i.e., approximately 10^4 organisms/ml). In addition, the BAD test is not rapid, taking up to 2 to 3 hours to complete, and is considerably more expensive to perform than a Gram stain on centrifuged CSF.

Over the years, many studies in both the pediatric and adult populations have assessed the clinical impact of the BAD test on the management of patients with meningitis (1-5). In a very comprehensive study, Perkins and his colleagues (1) examined the results of BAD testing for over 5,000 specimens that consisted mostly of urine and CSF specimens and reported that 31 of the 57 positive specimens or 54% were false positives. Of the 7 positive CSF specimens, only 5 (71%) were true positives. Following review of patient charts, these investigators also concluded that these was no demonstrable impact of a positive BAD test on any of the patients with true positive test results because the Gram stain-stained smears and cultures of CSF were also positive. Furthermore and very importantly, **there were no positive antigen tests on specimens whose cultures were presumed negative on the basis of prior antibacterial therapy. Also, all antigen positive CSF specimens had positive Gram stains**. In addition to the large number of false-positive specimens which resulted in the administration of unwarranted antibiotics and the unnecessary prolonged hospitalization of patients, another 7% of BAD test results were of indeterminate significance.

In short, the BAD test was originally implemented to assist physicians and other health care providers in the diagnosis of suspected bacterial meningitis. However, the test is no longer recommended for this purpose because experience has shown that the BAD test has limited sensitivity and specificity as well as having other performance problems. Patients with suspected meningitis should continue to be managed based on other available findings and more reliable laboratory tests, such as CSF Gram stain and culture results.

Please do not hesitate to contact me if you have any questions or concerns with this change in laboratory policy (W: 464-7653, e-mail: paulgranato@lacny.com).

References

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