LABORATORY DIAGNOSIS OF BACTERIAL MENINGITIS - A NEW LOOK AT AN OLD TESTS (REPORT)

Olga *Dorobăț*

Clinic of Infectious and Tropical Diseases, Bucharest

Since meningitis is an acute, life threatening disease, the examination of cerebrospinal fluid (CSF) is an emergency procedure. The differential diagnosis of meningitis is very important in the initiation of specific antimicrobial therapy. There are for the examination of CSF specific microbiological test and unspecific test.

The microbiological examination should be performed immediately upon receipt of the sample in the laboratory in order to obtain preliminary information regarding the causative agent and to ensure that recovery of any microorganism is optimized.

Direct microscopic examination - the Gram stain is an important tool in rapidly ascertaining the presence of microorganisms in normally sterile CSF. For positive direct examination must be present 10^5 microorganisms/ml. Due to the frequent paucity of microorganisms in a specimen of CSF, a prolonged examination of Gram stained smear is dicteted. The microorganisms may have an altered. Gram stain appearance for the patients previously with antimicrobial therapy. The diagnostic value of the direct examination is superior to other test (74% positivity).

Culture usually made from the sediment after centrifugation of the CSF using chocolate agar, sheep blood agar, AABTL and broth medium no.1 without indicator. The selection of specific media can be guided by results of direct microscopic examination. Isolates from the culturing of CSF should be subjected to further testing for definitive identification - metabolic, biochimical and serological procedures and immediately tested for their pattern antimicrobial susceptibility. Although culture indicates bacterial etiology it is important to note that in our country a substantial proportion of patients with acute bacterial meningitis received preadmission antibiotic therapy and the culture is of little value (<50%). Throat culture from patients with meningococcal meningitis can be useful in the diagnosis of meningococcal meningitis when the patients have antibiotics before admission into hospital.

Methods for detecting characteristic antigens of pathogenetic microorganisms in patient CSF are typicaly faster than traditional methods such as direct bacterioscopic examination and culture. These technique include CIE, Latex and co-agglutination, ELISA, RIA. Latex and co-agglutination has been found to be more rapid, sensitive, to perform easyer and cheaper in the detection of purified antigen. In addition to specific microbiological tests, unspecific CSF test are widely accepted for the differential diagnosis of meningitis. These unspecific tests include determination of the white blood cell count (WBC), differential count, total protein level and glucose level, as well as the CSF/blood glucose ratio. In addition several other CSF test have been evaluated in the diagnosis of meningitis such as limulus lysate assay, nitroblue tetrazolium test, determination of chloride, lactat dehydrogenase, total aminoacid, lactat and C-reactive protein (CRP) levels. Of these additional tests some are laborious and time consuming, other have low diagnostic potential. It is important to note that a substantial proportion of patients with acute bacterial meningitis had a CSF-WBS low values. Bacterial meningitis with low CSF pleocytosis is well know (25-35%). The rate of CSF lymphocytosis at the time of initial evaluation in patients with bacterial meningitis who have not received preadmission antibiotic therapy was between 1-32%. CSF glucose test and CSF blood glucose ratio were less sensitive for the diagnosis of bacterial meningitis. The diagnostic value is inferior to that of lactate and CRP determination. It is imperative to emphasize the need for careful complete and individualized evaluation of very patient suspected of having meningitis. This includes the evaluation of all CSF parameters for abnormalities as well as the patient's general clinical condition.