Utility of cerebrospinal fluid cortisol level in acute bacterial meningitis

Sir,

Thank you very much for your comments and subsequent discussion regarding the article.[1]

1. The cutoff values of cerebrospinal fluid (CSF) cortisol could not be established as the sample size was small; however, initially normative data were obtained on 25 patients (15 males and 10 females) without any preexisting neurological disorders, and those who underwent spinal anesthesia were included as controls. The average mean CSF cortisol level for controls was 1.05 μg/dL, following which, the same was studied in patients with bacterial meningitis (BM) and viral meningitis (VM) whose mean CSF cortisol levels were 13.85 μg/dL and 3.47 μg/dL, respectively, and which were statistically significant. Thus, CSF cortisol is practically easy to use and apply in the clinical setting.
2. There is no evidence that the lumber puncture (LP) procedure is harmful in most patients with suspected central nervous system (CNS) infection. There is belief that in the majority of these patients LP is safe, and potentially beneficial. In contrast, the avoidance of LP would appear to be potentially detrimental to patient care. LPs contributed directly to patient management in 72% of cases, either by identifying an organism, allowing unnecessary antibiotics/antivirals to be stopped after 24 h, or by permitting an earlier discharge from the hospital.[2] Hence, as a rule of thumb, one does CSF analysis for every suspected case of BM on the day of admission and a repeat analysis 72 h later and thereafter depending on the therapeutic response. Thus, in the same setting one can monitor CSF cortisol levels along with CSF pleocytosis in meningitis.
3. Yes, serum procalcitonin (PCT) could be considered as an alternative tool along with CSF cortisol level. Serum PCT decreases with antibiotic treatment and is related to the severity of the disease. However, we have also demonstrated the following:
    1. CSF cortisol levels had significant correlation with serum PCT as depicted in Figure 3 in our article. Similar observation was made by Viallon *et al*. (1999) and Schwartz *et al*. (2000).[3,4]
    2. There was significant reduction in the mean CSF cortisol levels with treatment (13.85 vs 1.55 μg/dL, $P < 0.0001$). Similar observation was also made by Holub *et al*. (2007).[5]

Serum PCT level estimation has its own limitation as follows:

1. Use of PCT to differentiate between BM and other causes of febrile encephalopathy, such as brain abscess is limited, as it is also elevated in patients with bacterial pneumonia, sepsis, and other bacterial infections.[6-8]
2. Diagnostic use of PCT in patients with acute meningitis in the presence of other bacterial infections is also potentially limited when compared to CSF analysis.

Thus, serum PCT may not be specific for BM (if associated with systemic bacterial infections). In such cases, CSF cortisol may prove to be a beneficial alternative as amply demonstrated in our study and Holub *et al*. (2007).[5]

No single CSF test has yet been proved to be fully reliable in distinguishing BM from aseptic meningitis. For rapid etiological diagnosis in meningitis, various CSF parameters along with a new parameter in the form of CSF cortisol assay and serum PCT must be combined.

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Conflicts of interest

There are no confl icts of interest.

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