Reviewer's report

Title: IgG-index predicts neurological morbidity in patients with infectious central nervous system diseases

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Reviewer: Anna Dorothee Heemskerk

Reviewer's report:

This paper aimed to evaluate the prognostic value and differential diagnostic value of basic CSF parameters. It addressed the important issue of risk assessment of patients with central nervous system infection and metastases. An elevated IgG index showed to be predictive of worse neurological outcome.

discretionary revisions

“This retrospective study was conducted in order to evaluate the predictive power of basic CSF parameters obtained by the initial as well as follow-up spinal taps for disease prognosis in patient with bacterial meningitis, viral meningitis / meningoencephalitis and LM.”

Although this research question is well defined, it however warrants some additional justification.

1. It seems that the 3 disease groups were pooled in order to evaluate the differential diagnostic rather than the prognostic value of CSF parameters. From a clinical standpoint, it is questionable whether pooling the groups is useful in the evaluation of prognostic markers only.

2. The authors should justify the need for additional markers in the “complex scores” that already exist.

“Patients were stratified into 3 diagnostic groups (bacterial meningitis, viral meningoencephalitis, LM) diagnosed by commonly accepted clinical and / or microbiological and pathological / cytological criteria”

3. These diagnostic criteria include basic CSF parameters. It is not clear what the sensitivities and specificities are. This is an essential weakness of the study and
should be mentioned in the paper.
4. Was lactate not included in CSF measurements?
5. Why were the primary tumors for LM not included in table 2?
6. CSF parameters for differential diagnosis of the 3 disease entities that the authors include in the study, have been well described in the past. In that sense this study is not innovative. It may improve the clarity of the paper if these results are omitted and add a short comment on this part of the study in the discussion.
7. Figure 2 and table 3 could include the other CSF parameters.
8. Was the choice of cut-off point of 0.75 for IgG index based on clinical or statistical reasons?
9. It does not become clear how the IgG-index develops over the course of disease in the follow-up lumbar punctures.
10. It would be interesting to include ideas on how IgG index may be incorporated in existing clinical work-up for bacterial and viral meningitis.
11. As early detection of markers is necessary for rapid initiation of appropriate treatment, the paper should mention the time to result of the significant CSF parameters.
12. The conclusion may be moderated by adding the need for prospective studies to consolidate the findings in this paper.

minor essential revisions

1. In table 2, the causes of bacterial meningitis add up to 100.2%

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests