Reviewer’s report

Title: Cerebrospinal fluid pleocytosis level as a diagnostic predictor? A cross-sectional study.

Version: 0 Date: 15 Sep 2016

Reviewer: Thashi Chang

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Cerebrospinal fluid pleocytosis level as a diagnostic predictor? A cross-sectional study.

This is an important area of research that is relevant to everyday Neurology practice. However, this paper requires major revisions before publication and additional statistical review.

Comments

1. Line 46. Better specified as 'non-infectious neurological diseases'.

2. The 'Conclusions' in the abstract are more than what is shown in the 'Results'. The conclusions need to be aligned with the results.

3. It would be good to define the term 'CSF pleocytosis' in the section of Background.

4. Line 86: it should be stated '1 leucocyte per 1000 erythrocytes'. Not vice versa.

5. Line 94: Is it 'culture' or 'cultivation'?

6. Line 101, items 4) and 5): The justifications in these two items to classify them as CNS infection are not strong enough. 4) If the patient was only 'observed for possible infection' but this was not included in the final diagnosis, it is likely that the clinician did not feel confident that it was indeed a CNS infection. 5) The mere empirical treatment with antibiotics does not justify a diagnosis of CNS infection if the clinician did not feel that it should be included in the final diagnosis.

7. In order for the reader to make sense of the results, the use and interpretation of the Charlson score needs to be described under statistical analysis.

8. CNS infection is also a neurological disease. Hence, the current categorisation as 'CNS infection' and 'Neurological' as separate categories is confusing. If at all it should be categorises as 'non-infectious neurological disorders'.

9. There are errors in the labelling in the table.
10. A major limitation in this study is that no attempt has been made to differentiate between the different types of infections which would have an enormous impact on CSF pleocytosis. Categorising bacterial infections which have high pleocytosis with viral which have low pleocytosis diminishes the significance and usefulness of this study. Furthermore, infections such as tuberculosis and fungi would present a completely different CSF profile and if these are not teased out, these results diminish in significance.

11. Data regarding aetiological diagnosis such as microscopy, culture, antigen tests, PCR which are gold standards for the diagnosis are lacking. The category of 'CNS infection' needs to be corroborated by such data.

12. CSF:serum glucose ratio which is relied upon heavily in clinical practice in differentiating the different aetiologies of CSF pleocytosis has been completely left out of this study. It needs to be included if these data are to be externally valid.

13. The discussion does not highlight what this study has added to what is already known with regard to CSF pleocytosis. Most of what has been presented is already known.

14. Would it be statistically possible to define a cut-off level for pleocytosis, along with positive and negative predictive values, that would predict CNS infection?

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

No

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Unable to assess

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

No

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I recommend additional statistical review

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