Reviewer's report

Title: CXCL13 may improve diagnosis in early neuroborreliosis with atypical laboratory findings

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Reviewer: Tobias Rupprecht

Reviewer's report:

The manuscript is a well written and concise report with two interesting major aspects: 1) the role of CXCL13 as an early and follow up marker for Lyme neuroborreliosis and 2) the important topic of an adequate Western blot

There are, however, some revisions to be done:

1) There exists already one case report, showing that an earlier diagnosis would have been possible if CXCL13 would have been used initially: “Rupprecht et al., Nervenarzt 2006: Cytokine CXCL13 - a possible early CSF marker for neuroborreliosis”. This should be mentioned in the manuscript.

2) The fact that CXCL13 has dropped during the first days of treatment, while the CSF cell count further increased should be mentioned in the discussion, as the cell count is so far the most frequently used follow up marker for treated Lyme neuroborreliosis, while CXCL13 would have been superior in this respect.

3) The authors state that no data on the CXCL13 response for other Borrelia species apart from B. garinii is available. This is not true. We have shown (“Rupprecht et al., Infect Immun 2007: Borrelia garinii induces CXCL13 production in human monocytes through Toll-like receptor 2, pg. 4352”) that B. afzelii leads to the induction of CXCL13 production in a similar manner.

Minor points:

4) In the discussion section, the authors use reference number 3 for their section on the pathophysiological process that leads to CXCL13 production. This was actually originally described in detail in “Rupprecht et al. Mol Med 2008: The pathogenesis of Lyme neuroborreliosis: from infection to inflammation”. I would think that this is the more appropriate reference. Reference number 3 should instead be used after "...pointing at a rapid downregulation of CXCL13 production after specific antibiotic therapy is initiated."

5) The date of the follow up puncture - 5 days later - should be included in the text of the case presentation.

6) The results of the borrelial serology in the initial CSF specimen should be included in the text of the case presentation.

7) At the end of the discussion, “Strle et al., Clin. Infect Dis 2006” should be cited for “B. afzelii might even cause LNB with normal CSF cell counts”, as this is the appropriate reference.
8) In table 1, is the unit [mg/dl] for the CSF protein right? It merely looks like [mg/l]!

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.