

LETTER

# Meningitis in patients with a Gram-negative direct cerebrospinal fluid examination: the value of cytochemical markers for the differential diagnosis

Hongliang Zhang<sup>1\*</sup>, Xiaoke Wang<sup>2</sup>, Yi Yang<sup>1</sup> and Jiang Wu<sup>1</sup>

See related research by Viallon *et al.*, <http://ccforum.com/content/15/3/R136>

We read with great interest the article by Viallon and colleagues [1] exploring the value of cytochemical markers for the differential diagnosis of meningitis in patients with a Gram-negative direct cerebrospinal fluid (CSF) examination. We have some concern as regards the confounding factors in their study. Firstly, although lumbar puncture was performed immediately on patient admission, the timepoint to obtain the CSF samples relative to the onset of disease was not uniform. For those patients with a Gram-negative direct CSF examination, the negativity may be attributed to a lumbar puncture at a very early stage. Secondly, the inclusion criteria are ambiguous. Meningitis was defined as a white blood cell count more than 5/mm<sup>3</sup> in the CSF. Blood contamination due to the lumbar puncture procedure cannot be ruled out. Moreover, the white blood cell count is insufficient to localize infectious inflammation to cerebral pia mater. In terms of this insufficiency, it is not surprising to see the low incidence of nuchal rigidity [1]. Thirdly, the lack of a gold standard for viral meningitis is a vexing problem. An imperfect standard to evaluate a diagnostic test may lead to distortions in sensitivity and/or specificity [2,3]. In this regard, a positive group and a negative group are indispensable to determine the sensitivity and specificity of either the serum or the CSF parameters in the differential diagnosis of meningitis. Aseptic meningitis

caused by intravenous immunoglobulin has not been excluded, since the causative virus was identified in only 39% of the patients with viral meningitis.

#### Abbreviations

CSF, cerebrospinal fluid.

#### Competing interests

The authors declare that they have no competing interests.

#### Author details

<sup>1</sup>Department of Neurology, the First Hospital of Jilin University, Jilin University, 130021, Changchun, China. <sup>2</sup>Department of Neurosurgery, the Second Hospital of Jilin University, Jilin University, 130021, Changchun, China.

Published: 5 September 2011

#### References

1. Viallon A, Desseigne N, Marjollet O, Biryńczyk A, Belin M, Guyomarch S, Borg J, Pozetto B, Bertrand JC, Zeni F: Meningitis in adult patients with a negative direct cerebrospinal fluid examination: value of cytochemical markers for differential diagnosis. *Crit Care* 2011, **15**:R136.
2. Valenstein PN: Evaluating diagnostic tests with imperfect standards. *Am J Clin Pathol* 1990, **93**:252-258.
3. Prasad K, Sahu JK: Cerebrospinal fluid lactate: is it a reliable and valid marker to distinguish between acute bacterial meningitis and aseptic meningitis? *Crit Care* 2011, **15**:104.

doi:10.1186/cc10320

Cite this article as: Zhang H, *et al.*: Meningitis in patients with a Gram-negative direct cerebrospinal fluid examination: the value of cytochemical markers for the differential diagnosis. *Critical Care* 2011, **15**:439.

\*Correspondence: drzhl@hotmail.com

<sup>1</sup>Department of Neurology, the First Hospital of Jilin University, Jilin University, 130021, Changchun, China

Full list of author information is available at the end of the article