Qualitative Difference in Lumbar and Ventricular Cerebrospinal Fluid in Tubercular Meningitis

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Disclosure

• No conflict of interest
Introduction

Tubercular Meningitis

- Frequent in developing countries
- High mortality - up to 21.1% depending on the stage of the disease

*Salekeen S. J Pak Med Assoc. 2013 May;63(5):563-7*

- Composition of Ventricular CSF and Lumbar CSF **DIFFERS**
  - Diagnostic and Management Implications
Methods

• Retrospective, analytical study
• National Institute of Neurolgical and Allied Sciences, Kathmandu, Nepal
• January 2015 to October 2017

• All patients with TUBERCULAR MENINGITIS
  – Simultaneous lumbar and ventricular CSF analysis

  Difference Analysed: WBC count, Differential count, Sugar Protein
Results

- 18 patients
  - 3 excluded (In 2 CSF analysis > a day apart; 1 traumatic tap)

<table>
<thead>
<tr>
<th>Baseline Demographic Characteristics</th>
<th>n(%)</th>
<th>Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11(36.7)</td>
<td>-</td>
</tr>
<tr>
<td>Female</td>
<td>4(13.3)</td>
<td>-</td>
</tr>
<tr>
<td>Age in years</td>
<td>-</td>
<td>37.3±15.9</td>
</tr>
</tbody>
</table>
# Results

## Association of Lumbar and Ventricular CSF content

<table>
<thead>
<tr>
<th>CSF contents</th>
<th>Site of CSF (n=30)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lumbar</td>
<td>EDV</td>
</tr>
<tr>
<td>^a^RBC</td>
<td>70(286)</td>
<td>34(879)</td>
</tr>
<tr>
<td>^a^WBC</td>
<td>58(177)</td>
<td>7(66)</td>
</tr>
<tr>
<td>^a^Neutrophil</td>
<td>20(30)</td>
<td>25(36)</td>
</tr>
<tr>
<td>^a^Lymphocytes</td>
<td>75(57)</td>
<td>70(40)</td>
</tr>
<tr>
<td>^b^Sugar</td>
<td>45.9±34.4</td>
<td>53.6±20.6</td>
</tr>
<tr>
<td>^a^Protein</td>
<td>161(163)</td>
<td>37(38)</td>
</tr>
</tbody>
</table>

^a^median(IQR) and Mann-Whitney U test, ^b^mean±SD and Independent t-test, **significant at p<0.001
Results

• The median (inter-quartile range)
  – Protein content
    • Lumbar CSF 161 (163)mg% was markedly higher
    • Ventricular CSF 37 (38)mg% ($p$=<0.001, Mann-Whitney U test)
  – Total WBC count
    • Lumbar CSF 58 (177) / cu mm was higher
    • Ventricular CSF 7 (66) / cu mm ($p$=0.061, Mann-Whitney U test)
Take Home Message

• A normal or near-normal **Ventricular CSF** study **DOES NOT** rule out **Tubercular meningitis**
  – due to probable flow block

• Lumbar CSF analysis may be imperative
Take Home Message

High **Protein content** in Lumbar CSF

Don’t delay **VP shunting**

in post-tubercular meningitis hydrocephalus

Ventricular CSF may be relatively clear