Characteristics of Acute Bacterial Meningitis and Predictors of Mortality

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Background

- Acute bacterial meningitis (ABM) is a medical emergency associated with morbidity and mortality.
- The aim of the study was to describe clinical features, causative organisms and predictors of death of community-acquired ABM.

Methods

- This retrospective study was conducted at Nakhonpathom hospital, a 722-bed tertiary care hospital in Thailand during July 2013 and August 2017.
- The diagnosis of community-acquired ABM was based on a compatible clinical picture plus one of the following:
  - Positive CSF culture
  - Positive blood culture
  - Positive CSF gram stain and/or antigen test
  - CSF neutrophilic pleocytosis defined as wbc ≥ 100 cells/mm³ of which ≥ 50% were neutrophils with decreased glucose, and increased protein concentration
- Factors associated with death were analysed.

Results

- There were 55 patients.
  - Mean (SD) age was 47 (18) years and 69% were male.
  - Median duration of symptom before hospitalization were 2 (range 1-6) days.

<table>
<thead>
<tr>
<th></th>
<th>Alive (n =46)</th>
<th>Dead (n =9)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age, years (SD)</td>
<td>58 (20)</td>
<td>45 (16)</td>
<td>0.048</td>
</tr>
<tr>
<td>Positive blood and/or CSF C/S</td>
<td>31/46 (67.4%)</td>
<td>9/9 (100%)</td>
<td>0.05</td>
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<tr>
<td>CSF WBC, cell/mm³*</td>
<td>439 (25-8,617)</td>
<td>178 (1-99,000)</td>
<td>0.009</td>
</tr>
<tr>
<td>CSF PMN, % *</td>
<td>56 (2-98)</td>
<td>40 (0-86)</td>
<td>0.96</td>
</tr>
<tr>
<td>CSF protein, mg/dl *</td>
<td>215 (54-749)</td>
<td>133 (78-704)</td>
<td>0.63</td>
</tr>
<tr>
<td>CSF sugar, mg/dl *</td>
<td>40 (1-133)</td>
<td>48 (0-70)</td>
<td>0.52</td>
</tr>
<tr>
<td>Hydrocephalus on imaging</td>
<td>3/32 (9.4%)</td>
<td>2/3 (66.7%)</td>
<td>0.047</td>
</tr>
</tbody>
</table>

- CT brain were abnormal among 57% of 35 patients.
- Bacteria was isolated in CSF or blood in 40 patients (73%).
  - Sagalactiae (17 cases)
  - S.pneumoniae (4 cases)
  - Streptococcus group D (4 cases)
  - S.pyogenes (2 cases)
  - other beta-hemolytic streptococci (4 cases)
- All Sagalactiae and S.pneumoniae were penicillin sensitive.

Table: Predictors associated with mortality

- The in-hospital mortality was 20%.
- Factors associated with death were low CSF WBC, positive culture in CSF or blood and hydrocephalus on imaging.

Conclusions

- Acute bacterial meningitis remains associated with mortality.
- Age, CSF WBC, presence of bacteria in CSF or blood and hydrocephalus was associated with outcome.