The Impact of Multiplex PCR Panel in the Diagnosis of Meningitis in Children

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CONCLUSIONS

- There was 100% concordance between MEP and CSF culture for E. coli meningitis.
- The increased sensitivity of MEP may play a role in the management of partially treated meningitis.
- The use of the BioFire MEP may be helpful in decreasing the average LOS in patients where a viral etiology other than HSV is identified.
- Early identification of a pathogen other than HSV may decrease the number of acyclovir doses received.

BACKGROUND

- Cerebrospinal fluid (CSF) culture is the gold standard for diagnosis of bacterial meningitis, but results can take 48–72 hours.
- Patients remain hospitalized and receive antimicrobial therapy while awaiting results of CSF cultures.
- BioFire FilmArray™ Meningitis/Encephalitis panel (MEP) tests CSF for 14 bacterial, viral and fungal pathogens with turnaround time of 1 hour.
- The objective of the study was to compare the results of MEP to bacterial CSF cultures and potential impact on length of stay and antimicrobial use.

METHODS

- Retrospective review of data from MEP processed by Health Network Laboratories.
- Children 0–18 years of age from Feb. 1, 2016 to Dec. 31, 2017 at Lehigh Valley Children’s Hospital.

RESULTS

DISTRIBUTION OF PATHOGENS IN POSITIVE MEP

![Distribution of pathogens in positive MEP](https://example.com/distribution.png)

AVERAGE LENGTH OF STAY (LOS)

![Comparison of average length of stay for all samples, including MEP and cultures, with average length of stay for patients with positive MEP for viral pathogens other than HSV.](https://example.com/comparison.png)

<table>
<thead>
<tr>
<th>Turn around Time (hours)</th>
<th>MEP</th>
<th>CSF Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average TAT for all samples</td>
<td>6.9</td>
<td>48.8</td>
</tr>
<tr>
<td>Max TAT for all samples</td>
<td>46</td>
<td>80</td>
</tr>
<tr>
<td>Min TAT for all samples</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Average TAT for Positive samples</td>
<td>6.2</td>
<td>48.2</td>
</tr>
<tr>
<td>Average TAT for Negative samples</td>
<td>7.1</td>
<td>48.9</td>
</tr>
</tbody>
</table>

Table 1. Turnaround time in hours for MEP and CSF cultures.

Acyclovir Doses Received in Patients with Presumed HSV infection

<table>
<thead>
<tr>
<th>No. of patients</th>
<th>Avg. doses received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Patients receiving Acyclovir</td>
<td>58</td>
</tr>
<tr>
<td>Patients with Positive MEP for HSV</td>
<td>5</td>
</tr>
<tr>
<td>Patients with Negative MEP</td>
<td>37</td>
</tr>
<tr>
<td>Patients with Positive MEP other than HSV</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 2. Acyclovir doses received in patients with presumed HSV infection.

REFERENCES