Adherence to Laboratory Screening Recommendations for Neonatal Herpes Simplex Infection at a Tertiary Children’s Hospital

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Background

Though American Academy of Pediatrics (AAP) publications detail the precise laboratory evaluation to perform for suspected neonatal herpes simplex virus (HSV) infection, significant practice variability persists. The primary aim of this study was to assess adherence to AAP laboratory testing guidance for neonatal HSV at our hospital. Other aims included: 1) comparing adherence rates for infants tested due to concern for symptomatic infection with those screened due to maternal genital lesion presence at birth and 2) determining the rate of infected infants among those tested.

Methods

- Retrospective chart review
- Inclusion Criteria
  - Infants ≤30 days old hospitalized at Baystate Children’s Hospital from 2/1/13 – 6/30/16
  - Laboratory test for HSV performed
- Exclusion Criteria
  - Asymptomatic newborns of mothers with known HSV but no active lesions at delivery
- Operational Definitions
  - Complete evaluation – all laboratory testing for neonatal HSV obtained as per subject category & AAP recommendations1,2
  - Incomplete evaluation – lacking ≥ 1 lab test for neonatal HSV as per subject category & AAP recommendations1,2
  - Symptomatic infant – one with clinical findings/manifestations as defined by the AAP Red Book that could be indicative of neonatal HSV infection
  - Subject categories:
    - Asymptomatic neonates born to mothers with active genital lesions at delivery
    - Symptomatic infants with concern for neonatal HSV disease
- Study Procedures
  - Demographics, lab testing, and clinical outcomes were collected
  - Laboratory testing for HSV performed for each subject & designation of laboratory evaluations as complete or incomplete
- Data Analysis
  - Descriptive statistics for frequencies and percentages of evaluations by subject category, inpatient location and laboratory evaluation completeness
  - Chi-square and Fisher’s exact test used for subgroup analyses

Table 1. Evaluation Completeness by Subject Category

| Subject Category | Complete Evaluation | Incomplete Evaluation | p
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Asymptomatic</td>
<td>11</td>
<td>13</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Symptomatic</td>
<td>16</td>
<td>205</td>
<td></td>
</tr>
</tbody>
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Table 2. Maternal Genital HSV Status

| Maternal Status          | Complete Evaluation | Incomplete Evaluation | p
<table>
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<tr>
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<tbody>
<tr>
<td>No known maternal history</td>
<td>12</td>
<td>130</td>
<td>0.19</td>
</tr>
<tr>
<td>All others:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Maternal Hx of HSV &amp; no lesions at delivery</td>
<td>15</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>- Primary maternal infection at delivery</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Recurrent maternal infection at delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Maternal Hx of HSV &amp; unknown if lesions at delivery</td>
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Table 3. Tests Missing from Evaluations

<table>
<thead>
<tr>
<th>Test Missing</th>
<th>Symptomatic Evaluation</th>
<th>Asymptomatic Evaluation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood PCR</td>
<td>183</td>
<td>13</td>
<td>196/245 (80%)</td>
</tr>
<tr>
<td>Surface cultures</td>
<td>144</td>
<td>6</td>
<td>150/245 (61%)</td>
</tr>
<tr>
<td>CSF PCR</td>
<td>118</td>
<td>0</td>
<td>118/221 (53%)</td>
</tr>
</tbody>
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Results

- 281 records reviewed
- 36 records excluded* (6%)
- 245 records analyzed

- 24 asymptomatic infants born to women with active lesions
- 221 symptomatic infants w/concern for HSV disease

- 11 complete evaluations
- 13 incomplete evaluations
- 16 complete evaluations
- 205 incomplete evaluations
- 3 w/confirmed disease
- 1 w/confirmed disease

*Figure 2. Reasons for Exclusion

- Testing obtained as outpatient
- Testing of asymptomatic infants whose mothers did not have active lesions at delivery
- Duplicate records
- Evaluation of congenital abnormalities
- Evaluation initiated at outside hospital

Figure 3. Evaluation Completeness by Location

Figure 3. Evaluation Completeness by Location

Conclusions

- Adherence to AAP recommendations for neonatal HSV laboratory testing was poor – only 11% had a complete evaluation
- Complete evaluations more likely for asymptomatic infants born to mothers with active genital lesions at delivery (p<0.01)
- No association between known maternal history of genital HSV prior to delivery & evaluation completeness (p=0.19)
- Blood PCR omitted most often (80%), followed by surface cultures (61%)
- Surface PCRs performed for 39% of evaluations missing surface cultures
- Despite a low incidence of neonatal HSV, provider education regarding appropriate laboratory testing is clearly needed.
- Bundling computerized electronic orders for testing may improve adherence.

References


- p = 0.19