NATIONWIDE SURVEILLANCE OF PAEDIATRIC EMPYEMA IN NEW ZEALAND 2014 -2016

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AIMS

3. To document the burden of empyema in children aged <15 years in New Zealand including infectious aetiology, demographic and underlying conditions

4. To describe surgical and medical management, complications and outcomes

METHODS

5. Monthly notification of empyema cases in children aged 0-14 years admitted to hospital were notified to the New Zealand Paediatric Surveillance Unit (NZPSU) 1st May 2014 through to 1st June 2016.

6. Clinician questionnaires were used to collect demographics, management, laboratory results, complications and outcomes.

RESULTS

1. 127 notifications were received with 109 fulfilling the case definition and complete data available for 101 cases (93%)

2. Annual incidence of empyema related hospitalisations was 5.7/100,000 in children <15 years

Demographics:

- Gender distribution 54% male
- Median age 3.8 years (range 2 months to 14.9 years)
- 61% aged < 5yrs
- 46% of cases lived in the greater Auckland area
- Immunisation status: Hib 92%, PCV ≥3 doses 63%, Influenza <1%
- 26% of children had comorbidities ranging from mild asthma or eczema to immune-compromising conditions (such as Type 1 DM, neuroblastoma or polyclinical JIA on etanercept)

Microbiology:

- Causative organism was detected in 70%
- Of the 71 organisms detected, S. pneumoniae was the most common organism followed by S. aureus and S. pyogenes

Organisms detected in sterile sites in hospitalised empyema cases (N=71)

<table>
<thead>
<tr>
<th>Organism(s)</th>
<th>N=57</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streptococcus pneumoniae</td>
<td>17</td>
</tr>
<tr>
<td>Haemophilus influenzae</td>
<td>14</td>
</tr>
<tr>
<td>Staphylococcus aureus or Staphylococcus intermedius</td>
<td>14</td>
</tr>
<tr>
<td>Group B Streptococcus</td>
<td>7</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
</tbody>
</table>

Hospital Stay:

- Mean length of hospital stay: 18 days (range 6 to 56 days)
- 32% of cases required intensive care unit admission
- Mean length of ICU stay: 9 days (range 1 to 36 days)
- No deaths attributed to empyema

DISCUSSION

- Paediatric empyema rates in NZ appear higher than the UK (2.7/100,000) and Australia (<1/100,000) at 5.7/100,000
- Māori and Pasifika children were over-represented (33% and 24% of cases respectively)
- Nearly 4% of empyema cases had a bacterial pathogen identified
- S. pneumoniae was the most common organism (38%) followed closely by S. aureus (35%) of which 20% were MRSA

- Increasing incidence of MSSA invasive disease is well reported in NZ with stable MRSA proportion but we report high MRSA in this cohort
- Empyema cases reflect significant morbidity with a majority requiring surgical intervention, 1/3 requiring ICU, and prolonged hospitalization (18 days).

REFERENCES

8. NZPSU: NZ Paediatric Surveillance Unit staff and collaborators.