Update on pneumococcal surveillance in Lebanon

Surveillance for invasive pneumococcal disease (IPD) continues with the participation of 78 Hospitals all over Lebanon. Thanks to the hard work of all the physicians, microbiologists, and technicians who have made an effort to contribute to LIPSP. Since the beginning of the year 2012, we have collected a total of 30 Streptococcus Pneumonia samples. The total samples since the beginning of the study in 2005 is 286. The results will be presented in detail in this newsletter. To the right is the hospital contribution list for the 286 samples that were handed in since the beginning of this surveillance program.

We would like to thank all the hospitals that are contributing to LIPSP. We would also like to extend our thanks to the Ministry of Health for its cooperation and support.

### Demographics

- The age distribution of the 286 collected samples are distributed as follows:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percentage (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2y</td>
<td>23.8% (n=68)</td>
</tr>
<tr>
<td>2y-5y</td>
<td>16.1% (n=46)</td>
</tr>
<tr>
<td>6y-20y</td>
<td>11.2% (n=32)</td>
</tr>
<tr>
<td>21y-60y</td>
<td>16.4% (n=47)</td>
</tr>
<tr>
<td>&gt;60y</td>
<td>31.8% (n=91)</td>
</tr>
</tbody>
</table>

Figure 1: Age Distribution
The most prevalent serotypes/serogroups were: 19F, 6, 3, 14, and 19A. Serotype distribution is summarized in Figure 3.

Figure 3: Serotype distribution of IPD cases by vaccine coverage
• When all age-groups were considered together, vaccine coverage was: 41.3% (n=118) for PCV7, 53.5% (n=153) for PCV10 and 67.5% (n=193) for PCV13.
• Vaccine coverage per each age group is represented in Figure 4.

![Figure 4: Vaccine coverage by age group](image)

**Antimicrobial Susceptibilities**

Using the latest CLSI breakpoints which differentiate between meningeal and non-meningeal isolates:

• Susceptibility to Penicillin G was 76.2% (n=218).
• Susceptibility to Ceftriaxone 83.2% (n=238).
• Susceptibility to Erythromycin was 66.1% (n=189).
• Susceptibility was 99.5% to Levofloxacin and 100% to Vancomycin in the tested isolates.

**Statistics by Age Group**

The clinical presentation in each age group is summarized in Figure 5.

![Figure 5: Clinical Presentation by Age Group](image)

Susceptibility by age group is described in Table 1.

**Table 1: Susceptibilities by Age Group**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Penicillin Non-Susceptibility</th>
<th>Ceftriaxone Non-Susceptibility</th>
<th>Erythromycin Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 2 years</td>
<td>29.1% (16)</td>
<td>18.3% (11)</td>
<td>40.7% (24)</td>
</tr>
<tr>
<td>2-5 years</td>
<td>13.2% (5)</td>
<td>12.8% (5)</td>
<td>30.8% (12)</td>
</tr>
<tr>
<td>6-20 years</td>
<td>3.4% (1)</td>
<td>3.4% (1)</td>
<td>24.1% (7)</td>
</tr>
<tr>
<td>21-60 years</td>
<td>23.7% (9)</td>
<td>12.8% (5)</td>
<td>21.1% (8)</td>
</tr>
<tr>
<td>&gt; 60 years</td>
<td>13.4% (11)</td>
<td>13.1% (11)</td>
<td>26.2% (22)</td>
</tr>
</tbody>
</table>


References

**Our Future Plans**

- *Streptococcus pneumoniae* is the most prevalent cause of community-acquired pneumonia (CAP) leading to hospitalization.
- The use of conventional blood cultures for diagnosis may give false negative results (low sensitivity) attributable to the low prevalence of bacteremia in pneumococcal CAP, and to the prior use of antibiotics.
- We are starting a research protocol using Real Time-Polymerase Chain Reaction molecular diagnostic approach on blood samples taken from patients with symptoms and clinical workup suggestive of community-acquired pneumonia to prospectively assess the sensitivity of Real Time-PCR in detecting CAP and to determine by Multiplex PCR Serotype Deduction the pneumococcal serotypes that are responsible for pneumococcal CAP and are circulating in Lebanon.
- Data generated from this study will allow us to improve our molecular diagnostic testing and provide in the future a more rapid identification of bacteremic pneumonia, thus enhancing the diagnosis and optimizing the antimicrobial choice.

**Thank you**

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**Acknowledgements**

Thanks are due to Dr. Bernard Beall, Centers for Disease Control and Prevention (CDC), Atlanta, Georgia, for provision of the Multiplex PCR serotyping procedure and control *S. pneumoniae* strains.

Thanks to Ms. Caline Balaa for her aid in the statistical analysis.