Laboratory surveillance of invasive isolates of *Neisseria meningitidis*. Argentina 2015-2022

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Background

Invasive meningococcal disease (IMD) is a serious and potentially fatal condition. The incidence in Argentina is 0.2/100,000 inhabitants. In 2017 the Argentine National Immunisation Program (NIP) implemented MenACWY-CRM197 vaccine for 3-5-15 months and 11 years old. Since 2020 the NIP has recommended a combined vaccination MenACWY-4CMenB for high-risk groups. The aim of this study was to describe the clinical presentations and capsular groups distributions and characterize through Whole Genome Sequencing (WGS) invasive isolates of *Neisseria meningitidis* (Men) circulating in Argentina.

Methods

A total of 444 Men isolates recovered from children and adults with IMD during 2015-2022 were received at the National Reference Laboratory to confirm the capsular group using PCR and characterize through WGS (344 available). Libraries were sequenced with NovaSeq (Illumina) platform and the assembled genomes (Unicycler) were analyzed with PubMLST website.

Results

### Clinical presentations distribution

<table>
<thead>
<tr>
<th>Clinical presentation</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meningitis</td>
<td>239</td>
<td>53.8</td>
</tr>
<tr>
<td>Meningococemia</td>
<td>82</td>
<td>18.5</td>
</tr>
<tr>
<td>Mening- Meningococ.</td>
<td>59</td>
<td>13.3</td>
</tr>
<tr>
<td>Bacteremia</td>
<td>42</td>
<td>9.5</td>
</tr>
<tr>
<td>Arthritis</td>
<td>9</td>
<td>2.0</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>8</td>
<td>1.8</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>1.1</td>
</tr>
</tbody>
</table>

### Capsular groups distribution

- **B**: 31.8%
- **C**: 53.2%
- **W**: 3.8%
- **Y**: 10.1%
- **Others**: 1.1%

### Annual relative frequency of capsular groups

- **B**: 31.8%
- **C**: 53.2%
- **W**: 3.8%
- **Y**: 10.1%
- **Others**: 1.1%

### Main associations between PorA peptides (VR1, VR2) and clonal complexes in MenB

- ST-865
- ST-29
- ST-41/44
- ST-162
- ST-563

### Main associations between fHbp peptides and clonal complexes in MenB

- ST-865
- ST-29
- ST-41/44
- ST-162
- ST-563

### NadA peptide was present only in 13.5% MenB isolates

### Conclusions

- **B** was the most prevalent capsular group, associated mainly with ST-865 complex and ST-35 complex.
- WGS of ST-865 complex isolates could help clarify why these strains that are uncommon in other regions became the leading cause of IMD in Argentina.
- The presence of NadA peptide 6 in W strains could suggest that they exhibit cross-reactivity with 4CMenB vaccine, according to our previous study of serum bactericidal activity (sHBA).
- MenDeVar results must be carefully analyzed taking into account our previous sHBA assays and the same MenB clonal complexes distribution regarding to the precedent period.

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