Unexpected High Carriage Rate of Neisseria Meningitidis Among Dormitory Residents in Tokyo, Japan

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BACKGROUND
In June 2014, two cases of upper respiratory infection with positive result of Neisseria meningitidis (N.men) from throat swab has been notified to a local health department from a school in Tokyo. Approximately 900 students and staff are active at school and all students are living in a dormitory built on the same property with school. Active case finding identified 10 additional cases. In Japan, previously reported carriage rate of N.men among healthy young adult is 0.4% (1).

METHODS
• All students and staff at school were taken nasopharyngeal swab from Dec 17 - 21, 2014
• Demographic, clinical, and risk factor information were collected by questionnaire
• Secretion was applied to Thayer-Martin Selective Agar, Incubated for 18 hours at 37°C
• Positive isolates underwent identification test by commercial identification kit. Selected isolates were examined for molecular characterization: MLST
• Serogroup was determined by PCR
• Carriage rates of N.men were calculated for overall, for all students and all staff, and for each class
• Those who has taken antibiotics within one month prior to the swab collection and/or history of MCV4 vaccination were excluded from the analysis
• PASW Statistics 18 SPSS Inc is used for analysis
• This study was approved by National Institute of Infectious Disease IRB committee

RESULTS

Table 1. Demographics and Carriage Rate results

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Carriage Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short</td>
<td>42.4</td>
</tr>
<tr>
<td>Long</td>
<td>28.4</td>
</tr>
<tr>
<td>Overall</td>
<td>35.0</td>
</tr>
</tbody>
</table>

Table 2. Symptoms of N.men Positive Cases Within Two Week Prior to the Carriage Test

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>11 (4.5%)</td>
</tr>
<tr>
<td>Muscle/Pain</td>
<td>88 (38.9%)</td>
</tr>
<tr>
<td>Rhinorrhea</td>
<td>54 (18.8%)</td>
</tr>
</tbody>
</table>

SUMMARY

• Total of 940 samples were collected
• 59 cases (49.4%) were eligible for analysis
• 174 students who reside in dorm and 117 teachers who works at the school built in the same property as the dormitory
• The average age for the participants was 24.2 years old, 21.7 years old for students and 40.1 years old for teachers.
• Approximately 80% of the participants were male
• Average number of students in the class was 130 (range 96-182)
• The carriage rate for whole group was 32.2%
• 34.2% for students and 18.8% for staff
• Male tends to have higher carriage rate
• Range of carriage rate differs by groups (14.6-64.9%)
• Those who resided at the dorm longer as total (C vs E), longer before the carriage study was conducted (B vs C), and those who underwent Short training course (D vs E) tends to have higher carriage rate
• Apart from living in dormitory, no statistically significant high risk factors were found
• Among randomly selected positive isolates (n=12), 11 (91.7%) was serogroup Y, ST-1655 and one untypeable, ST-198
• No invasive case has been reported

REFERENCES

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