Measles: the vaccine efficacy in practical activity

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Background

• Despite of the large scale measles vaccination programs, measles has still an epidemic evolution more often than expected (1, 2).

• In Romania, measles vaccination program was introduced in May 1979, and incidence dropped promptly to a very low level (fig.1) (3, 4).

• Since then, several epidemics have evolved in our vaccinated population; the last one started quite recently (fig.2).

• In previous epidemics the proportion of cases with vaccination history has been growing (fig. 3) (4).

Fig. 1: Measles evolution in Romania – before and after measles vaccine implementation

Fig. 2: Measles epidemics in the vaccinated population of Romania, 1985-2010

Fig. 3: Proportion of cases with history of vaccination in three previous measles outbreaks (5)

Objective: to measure the efficacy of measles vaccination in three epidemics in Cluj County.

Methods

• Aiming to measure the efficacy of measles vaccine we conducted a case-control study, for the epidemics of 1986-87, 1993-94 and 1997-98;
• The data sources were the records of family doctors from Cluj County in both urban and rural areas;
• The target age group was 1-4 years;
• Controls were children registered at the same doctor, of same age ± one month;
• The vaccination history was searched in cases and controls;
• Data base and statistics – in Excel.
Results

- 165 children for the 1986-87 epidemic, 589 for 1993-94 epidemic and 255 for 1997-98 measles epidemic seasons were included in this case-control study;
- The vaccine efficacy for the three epidemics was:

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<tbody>
<tr>
<td></td>
<td>Case</td>
<td>Control</td>
<td>Case</td>
</tr>
<tr>
<td>Vaccinated</td>
<td>29</td>
<td>114</td>
<td>170</td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>11</td>
<td>12</td>
<td>37</td>
</tr>
<tr>
<td>Odds vaccinated</td>
<td>2,6:1</td>
<td>9.5:1</td>
<td>4,6:1</td>
</tr>
<tr>
<td>Odds Ratio</td>
<td>0,28</td>
<td></td>
<td>0,25</td>
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<tr>
<td>Vaccine efficacy</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC95%</td>
<td>30,8 – 88,9</td>
<td></td>
<td>54,9 – 85,7</td>
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<tr>
<td>Rs</td>
<td>&lt;0,01</td>
<td>&lt;0,001</td>
<td>&lt;0,001</td>
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Discussions

• We analysed these three epidemics because the medical records were filled in similarly; starting the year 2000 the measles national surveillance program changed.
• The analysed target group was chosen as being the most vulnerable to severe clinical forms of disease.
• The observed values of measles vaccine efficacy (in our study) are lower than real, because of the nature of case-control study and the use of medical records for data collection.
• The assessment of field vaccine efficacy explores both the potential clinical efficacy of vaccine and the entire vaccination program as well(6).

Conclusions

• In the day-by-day routine practice, the measles vaccine efficacy remains high in the most vulnerable age group (1 – 4 years of age), and stays the most important component of the measles elimination program.

• The continuous passive surveillance of measles vaccine efficiency is an essential tool of long-term measles control strategy.
Bibliography