Estimation of serotype distribution of Streptococcus pneumoniae causing meningitis in infants in selected countries of the European and Asian regions (2009 -2014).

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Introduction and Purpose:

The aim of the study was to estimate Streptococcus pneumoniae (S.p.) serotype distribution and its coverage by available vaccines in selected countries of the European and Asian regions (Azerbaijan, Armenia, Ukraine, Belarus, Uzbekistan and Georgia) (Fig.1). The study was conducted on the base of Regional Reference Laboratory (RRL) for invasive bacterial diseases of WHO Regional Office for Europe at G.N. Gabrichevsky Research Institute for Epidemiology and Microbiology, Moscow, RF.

Methods:

1808 CSF samples and 24 clinical isolates of S.p. were investigated. CSF samples were collected by lumbar puncture in patients with fever over 38^{0}C and signs of meningeal irritation. Species identification was performed at hospital laboratories and determination of S.p. serogroups and serotypes was performed at RRL. Samples and isolates were tested using bacteriological, serological (quellung reaction) and molecular genetic tests (PCR) according to the WHO recommendations.

Results:

111 CSF samples were found to be LytA positive and 24 clinical isolates were identified as S.p.. The most common serogroup among typed S.p. was 6 (Fig. 2). It includes serotypes 6A and 6B which are covered by PCV13, meanwhile PCV7 and PCV10 cover only serotype 6B. 70.5% of investigated S.p. serotypes are included in the PCV13. Serotypes included to PCV7 and PCV10 accounted 64.1% and 68.75% respectively (Fig.3).

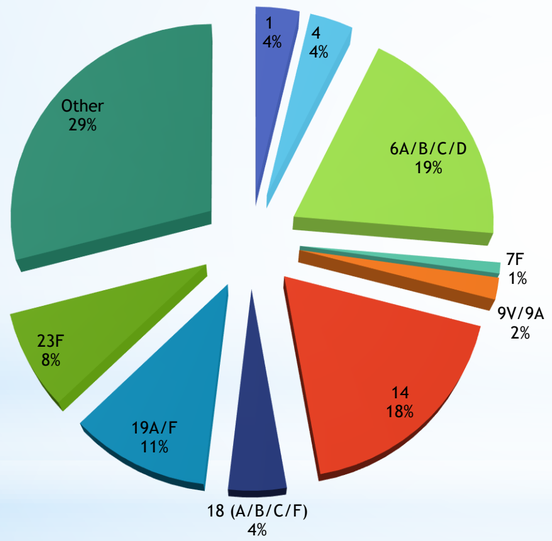

Figure 2. Streptococcus pneumoniae serotype distribution in selected countries (2009-2014)

Conclusions:

According to the received data the highest coverage for circulating S.p. serotypes in the selected area in children under the age of 5 is provided by PCV13. It is indicating the feasibility of its use. However, there is a need for more in-depth data analysis of serotype landscape and vaccine coverage for each country, since the distribution of serotypes has specific regional characteristics

Attention is drawn to the high proportion of serogroup 6 and serotypes 14, 23F and 19F, which is typical for countries where mass vaccination against pneumococcal disease was not carried out.

Serotype identification in serogroups revealed is important for planning of vaccination against pneumococcal infection and estimating of its efficiency due to different coverage of polyvalent conjugated vaccines (PCV7, PCV10 and PCV13) for circulating serotypes.

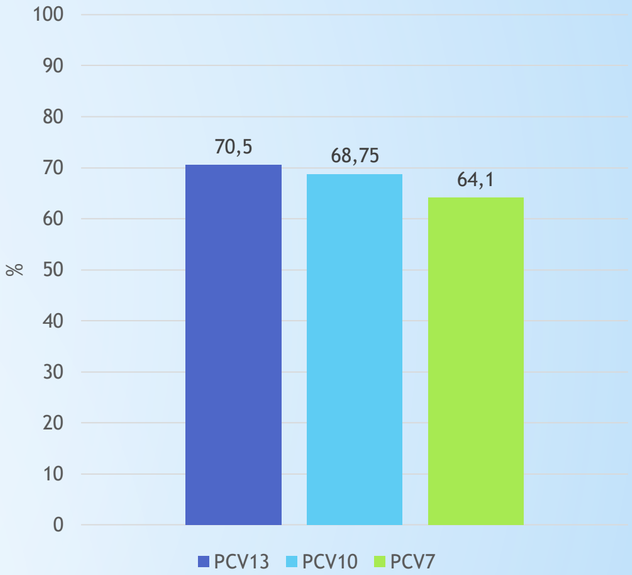

Figure 3. PCV serotype coverage in selected countries (2009-2014)

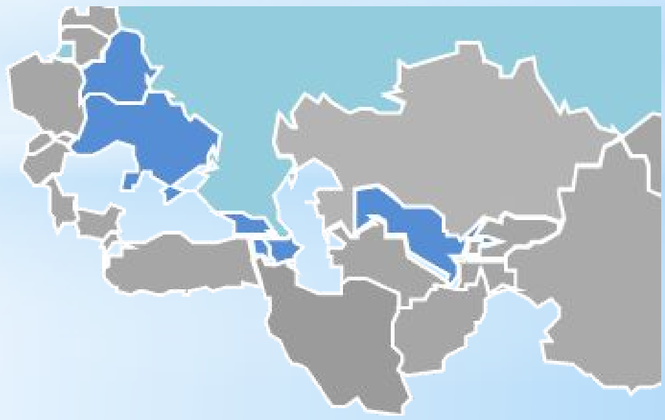

Fig.1 Countries of the European and Asian regions enrolled in the program

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