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ePoster Viewing
Vaccines for pneumococci, Haemophilus and meningococci

PHEROTYPE DIVERSITY IS NOT AFFECTED BY CONJUGATE VACCINE INDUCED SEROTYPE CHANGES

J. Diamantino-Miranda[1], S.I. Aguiar[1], J. Melo-Cristino[1], M. Ramirez[1]

[1]Institute of Microbiology, Instituto de Medicina Molecular Faculdade de Medicina de Lisboa, Lisbon, Portugal

Background and objectives: Recombination through transformation is the main mechanism of genetic transfer in *Streptococcus pneumoniae*. It occurs when bacteria become competent, which is triggered when the competence-stimulating peptide (CSP) reaches a critical extracellular concentration. There are two major variants of this 17 aa peptide in the pneumococcal population. Any given strain presents only one type of CSP and is not able to respond to the other variant. Hence, this determines the pherotype of the strains, which can be CSP1 or CSP2. We previously reported that pherotype is driving genetic differentiation within *S. pneumoniae*. It was seen worldwide that the introduction of the conjugate vaccines changed the serotype distribution of pneumococcus causing invasive pneumococcal disease (IPD). After PCV7 introduction in 2001 in Portugal, the serotypes 4, 6B, 14 and 23F decreased while 19A serotype increased. The introduction of PCV13 in early 2010 caused the decrease of serotypes 1 and 19A, while there was a small rise in non-vaccine serotypes. The aim of this work was to evaluate the effect of these vaccine induced changes in the pherotype distribution of the invasive pneumococcal population.

Methods: We determined the pherotype and serotype of a collection of 386 strains causing IPD in children in Portugal between 2009 and 2012. We also compared our results with data from the periods before PCV7 and PCV13 introduction (1999 to 2008).

Results: We were able to determine the pherotype of 379 strains and 298 (78,6%) were CSP1 and 81 (21,4%) CSP2. We were not able to amplify a PCR product from six strains, of which four were serotype 25A, and the other two 7F and 12B. We also found that a strain of serotype 6C had an insertion in the comCDE operon. There was an association of serotypes 1, 7F and 14 with CSP1 and 6A, 9N, 10A, 19A, 19F, 24A and 24F with CSP2 ($p < 0.05$ with the false discovery rate correction for multiple testing). Comparing with the period before PCV13 introduction, the proportion of the pherotypes did not change (79,6% and 20,4% of CSP1 and CSP2, respectively) and the associations with serotype remained the same, except for 10A and 24A which were not significantly associated to any pherotype in the pre-vaccination period.

Conclusions: Surprisingly, the dramatic changes in the serotype distribution of the population causing IPD in children brought about by conjugate vaccines, did not alter the proportion of CSP variants. This suggests that pherotype may play an important role in the pneumococcal population, although its precise function remains elusive.