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Vaccines for pneumococci, Haemophilus and meningococci

A STREPTOCOCCUS PNEUMONIAE SEROTYPE 19F WZY VARIANT IN VENEZUELA AND PNEUMOCOCCAL VACCINE CROSS-PROTECTION

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Objectives. To describe a commonly occurring *Streptococcus pneumoniae* serotype 19F *wzy* variant in Venezuela, typed as 19F with the Quellung reaction but not detected using PCR for the deduction of serotypes and to determine vaccine cross-protection for these *wzy* variant strains.

Methods. The *wzy* gene of the serotype 19F variant was sequenced. Primers were designed targeting the variant *wzy* gene for the detection of the serotype in our strain collection. Multilocus sequence typing (MLST) was performed to determine the Sequence Type (ST) of a representative group of the variant strains. Mice were immunized to determine with a pneumococcal opsonophagocytic killing assay (OPKA) pneumococcal vaccine cross-protection for the 19F variant strains.

Results: Sequencing of the variant *wzy* gene of the strains revealed that the gene sequence matched (with 99% identity) the sequence for the *wzy* gene of a rare 19F isolate previously reported by Pimenta *et al*; a 19F variant which has 88% identity with serotype 19A *wzy* gene and 78% identity with the *wzy* gene of serotype 19F. All variant 19F strains gave a positive PCR signal of \approx 607 bp with the newly designed primer set and no positive PCR signal was obtained with 'real' 19F strains. 85% of the 19F strains recovered from the eastern part of the country carried the *wzy* variant gene. MLST of 10 of these pneumococcal variant strains, isolated on different time points and from different geographic locations, showed that 8 strains are of Sequence Type ST391. In addition one strain with ST3260 and one with SLV1801 were found. We determined that the 19F variant strains were equally well killed by 19F sera in the OPKA as truly 19F control strains.

Conclusions: A 19F serotype variant commonly occurring in the Eastern part of Venezuela has been characterized and can be detected with PCR with a newly designed primer set. Given the lack of cross-protection between 19F and 19A, the key role of the *wzy* gene in those serotypes and the divergence of the *wzy* gene in our isolates it was tempting to speculate about vaccine cross-protection for the variant 19F strains, however the OPKA shows that pneumococcal vaccination will most probably protect against this variant 19F strain.