

Pilus islets and the clonal spread of piliated *Streptococcus pneumoniae*: a review

ABSTRACT

Pneumococci are a common cause of severe infections, such as otitis media, pneumonia, meningitis and bacteremia. Pili are detected in a small proportion of pneumococcal population, but these structures have recently been associated with bacterial virulence in humans. Therefore, the epidemiological relationships between pneumococcal pili, serotype and antimicrobial resistance are of interest. This study aims to discuss the virulence contribution of the *Streptococcus pneumoniae* pili and the epidemiological relationships among the pilus genes, antimicrobial resistance trends, regional serotypes and genotypic variations. Previous reports have characterized the pneumococcal pilus islet as a clonal feature in the pneumococcal serotypes that are covered by the pneumococcal conjugate vaccine (PCV), including serotypes 19A, 19F, 23F and 7F. Many of the pneumococcal molecular epidemiology network (PMEN) clones are piliated isolates that are also strongly associated with a high frequency of multidrug resistance. Most of these piliated pneumococcal isolates belong to a few clonal complexes (CC), such as CC320, CC199, CC271, CC191 and CC156. Additional molecular epidemiology and genomic studies, particularly whole genome sequence analysis (WGS), are needed to develop an in-depth understanding of the piliated pneumococcal isolates.

Keyword: *Streptococcus pneumoniae*; Pilus; Serotype; Antimicrobial resistance; Clonal complex (CC)