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Serotype distribution and Penicillin resistance of *Streptococcus pneumoniae* in Kuwait: A ten-year study of impact of pneumococcal conjugate vaccines

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Introduction & Objectives: The pneumococcal conjugate vaccine-7 (PCV-7) was introduced in Kuwait in August 2006 and PCV-13 in August 2010 for children less than 2 years. The study is done to evaluate the impact of PCV7 and PCV13 on serotype distribution and antimicrobial resistance of invasive *S. pneumoniae* isolates.

Methods: The study included all cases of invasive pneumococcal disease (IPD) divided into two periods. The pre-vaccination period is from August 2003 to July 2006 and the post-vaccination period is from August 2006 to July 2013. Serotyping and Penicillin susceptibility testing are done using Quellung reaction and Etest method respectively.

Results: There are 63 invasive isolates, 25% from children ≤ 5 years and 156 invasive isolates, 28% from children ≤ 5 years in the pre and post vaccination periods respectively. In the pre vaccination period, PCV-7 and PCV-13 vaccine coverage in all age groups and in children < 5 years is 50% and 70% respectively. In the post-vaccination period, the vaccine coverage in all age groups and in children < 5 years is 21%, 29% for PCV-7 and 46% and 51% for PCV-13. The drop in vaccine serotypes and the increase in the non-vaccine serotypes during post vaccination period compared to pre vaccination period are statistically significant (p value 0.001). Penicillin resistance among *S. pneumoniae* isolates dropped from 67.9% in pre vaccination period to 46.2% in post vaccination period (p value 0.006).

Conclusion: After 7 years of PCV use in Kuwait, new emerging serotypes of *S. pneumoniae* are seen.

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