Serotype Distributions and Analysis of Susceptibility Profiles of Streptococcus pneumoniae Causing Infections in Adult Patients in the United States (2009–2013)
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MATERIALS AND METHODS

Clinical isolates

A total of 8,061 isolates from adults (mean age 65.3 years; median age 70 years; range 18–108 years) were evaluated from 2011 to 2013. Isolates were recovered primarily (79.0%; 3,549/4,491) from lower respiratory tract specimens and submitted to a central monitoring laboratory (JMI Laboratories, North Liberty, IA, USA), as part of the US population-based Pneumococcal Surveillance Program. Patients with respiratory infections were included. Isolates from non–US residents were not included. Isolates were identified using morphology and biochemical algorithms.

Confirmation of bacterial identification was performed by colony morphology and biochemical algorithms.

Antimicrobial Susceptibility Testing

Isolates were tested using the standard CLSI broth microdilution method. MIC values were interpreted according to CLSI criteria (CLSI, 2016). Interpretation of antimicrobial susceptibility breakpoints are as follows: susceptible, MIC ≤0.5 μg/mL; intermediate, 1–4 μg/mL; and resistant, ≥8 μg/mL.

Pneumococcal Serotyping

Isolates were subtyped using the Vaccine serotypes and non-vaccine serotypes. Serotyping was performed using the Wgift brochure typing kit. All serotypes were subtyped by multiplex PCR. The pneumococcal conjugate vaccine (PCV13; Prevnar 13/Prevenar 13, Wyeth/Pfizer Vaccines) containing all of the vaccine serotypes was licensed for use in children in 2005. The licensed conjugate pneumococcal vaccine for adults (PPV23; Synflorade, Sanofi Pasteur) containing all of the vaccine and non-vaccine serotypes was licensed in 2004.

RESULTS

Isolates were subtyped using Vaccine and non-Vaccine serotypes. The proportion of isolates by Vaccine serotype and non-Vaccine serotype is shown in Figure 3. Overall, a total of 25.8% of isolates consisted of serotypes that are unique to PPV23, with a consistent distribution in all subgroups by age and risk.

DISCUSSION

Despite PCV23 use in adults for 3 decades with approximately 60%–85% vaccination coverage over the last decade, PCV7 use in children since 2000, PCV13 use in children since 2010, and significant herd effects for IPD in children and adults, there remains a significant burden in respiratory outcome of adults presenting for respiratory infections.

The circulation of PCV and PCV13 serotypes in this population could be addressed by direct vaccination of adults with PCV13.

With the ability to prevent nasopharyngeal colonization, vaccination of adults with PCVs may change the transmission dynamics in the adult population.

Continued surveillance remains important for monitoring the impact of pediatric and adult immunization programs in the US adult population.

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