Nasopharyngeal carriage of *Streptococcus pneumoniae* in older adults with community acquired pneumonia in Italy, 2013 - 2015

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**Background**

Infant routine administration of the 7-valent conjugate vaccine (PCV7) since 2000 and of the second-generation conjugate vaccines (PCV10 and PCV13) since 2010 has reduced pneumococcal disease burden in both vaccinated and unvaccinated children, and indirectly among adults in many countries, owing to herd immunity. Nasopharyngeal carriage of *Streptococcus pneumoniae* is considered a prerequisite for pneumococcal disease, however the herd effect of infant immunization on vaccine and non-vaccine serotype colonisation in elderly is not well established.

In Italy, in 2011, PCV13 vaccination coverage in children aged <24 months reached nearly 90% on a national basis and 95% in some regions, including Apulia (in the Southeast of Italy). With regard to adults, the 23-valent pneumococcal vaccine (PPV23) has been recommended, concurrently with flu vaccine, for people aged 65 or older and for defined at risk subjects, reaching very low vaccination coverage.

In Apulia, PPV23 was replaced in 2012 with a PCV13 age-based strategy targeting 65-, 70-, and 75-year-olds, reaching coverage of 34% among 65 year olds in 2014.

This study aims to evaluate pneumococcal nasopharyngeal carriage among adults ≥65 years with community acquired pneumonia (CAP) in Apulia in the period 2013-2015.

**Material/Methods**

We conducted a prospective-population-based, laboratory-confirmed surveillance to detect CAP cases meeting the following inclusion criteria: subjects resident in Apulia, ≥65 year olds, ≥2 symptoms and/or signs of CAP. Informed consent, clinical information, medical and vaccination history, nasopharyngeal swabs, sputum and/or blood specimens were collected. Specimens were tested and serotyped by RT-PCR.

**Results**

A total of 226 cases were enrolled, 210 (65% males, mean age 79 years) met the inclusion criteria. Of 195 cases with a swab sample, 76 were positive for *Streptococcus pneumoniae*, amounting to an overall nasopharyngeal colonisation rate of 39% (95% CI= 32.1-45.9%). Of the 76 isolates, 61 (80%) were PCV13-types and 66 (87%) PPV23-types. The most common serotypes were 9V (n=14), 23F (n=10), 14 (n=10), 19A (n=8) and 3 (n=7) (Figure).

Twelve/76 cases (16%) had previously received PCV13 and 23/76 (30%) PPV23 less than 5 years. Forty-three/76 (57%) cases had also a sputum and/or a blood sample positive for pneumococcus.

**Conclusions**

Even in the tenth year after implementation of PCV7 and in the sixth year after the replacement with PCV13 in the childhood immunization schedule, we found a high rate of carriage of vaccine serotypes in older adults, indicating a lack of herd effect in this age group despite universal vaccination. Our findings support the importance of implementing the ACIP vaccine recommendations for routine use of PCV13 (and PPSV23 in series) in adults aged ≥65 years and of conducting continuous surveillance of serotypes that still influence the burden of pneumococcal disease.

**Disclosures**

Dr. Prato reports an unrestricted research grant from Pfizer Italia S.r.l. to act as the Principal Investigator in the laboratory-confirmed surveillance discussed herein. She has served in advisory committees and as a speaker in conferences related to pneumococcal vaccines for Pfizer. She also reports grants and nonfinancial support from Sanofi Pasteur MSD, GSK, and Novartis, outside this work. Dr. Martinelli has received travel expenses from Pfizer to take part in conferences. All other coauthors have no conflicts relevant to this study to disclose, with the exception of funding needed to conduct the surveillance.