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Emergence of Multidrug Resistant Serotype 24 among Children under 2 years old with Invasive Pneumococcal Disease after the Introduction of PCV13 in Argentina

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Background: In Argentina PCV13 was included in the National Vaccination Program in Jan 2012 for children <2 y.o. Since 1993 *S. pneumoniae* (Spn) Surveillance Program (SIREVA II-OPS/WHO) was conducted in the National Reference Laboratory (NRL). Serotype 24 rarely found before 2012, emerged after the introduction of PCV13. We aimed to analyze the trend in serotype 24 distribution and its associated resistance in children <2 y.o. between 2010 and 2016.

Methods: 1821 Spn isolates (<6y.o.) from sterile fluids were received at NRL between Jan 2010 and Dec 2016 from 150 hospitals, 24 provinces and Buenos Aires city; 1029 (56.5%) <2 y.o. Isolates were serotyped by Quellung, MICs were performed by agar dilution (CLSI) and resistance genes by PCR. Diagnosis: pneumonia (42%), meningitis (28%), sepsis (16%), other (14%). 80/1029 (7.8%) Spn were serotype 24. Three periods were defined: pre-PCV13 (2010-11), transitional (2012) and post-PCV13 (2013-16).

Results: Among 1029 Spn isolated in <2 y.o., PCV13 serotypes decreased from 86.4% (pre-PCV13) to 33.7% (post-PCV13) related to serotypes: 14, 6A, 6B and 5 ($p<0.05$). Non-PCV13 serotypes increased from 13.6% (pre-PCV13) to 66.3%% (post-PCV13), mainly due to serotypes 24, 12F and 23B ($p<0.05$). Among 80 serotype 24 Spn, 44 (55%) were <1 y.o. Serotype 24 increased from 2.1% to 16.2% (pre-/post-PCV13), and ranks first since 2013. Antimicrobial non-susceptibility (NS) among serotype 24 in pre-/post-PCV13 periods was: penicillin (PEN) (MIC ≥0.12µg/ml) 70/91.2%, cefotaxime (MIC≥1µg/ml) 0/1.5%, erythromycin (ERY) 70/89.7%, tetracycline (TET) 60/83.8% and trimethoprim-sulfamethoxazole (SXT) 60/89.7%. NS to meropenem, chloramphenicol, levofloxacin, rifampicin, ceftaroline and vancomycin was no detected. 97.1% of ERY-NS isolates carried *ermB* and 2.9% *mefA* genes. All the TET-NS isolates carried the *tetM* gene. Multidrug resistance to PEN, ERY, TET and SXT increased from 50% in pre-PCV13 to 82% in post-PCV13 period ($p<0.05$).

Conclusion: Serotype 24 represents the main non-PCV13 serotype in <2 y.o. with IPD after the introduction of PCV13. We observed an increase in prevalence and multidrug resistance in post-PCV13 period. Our results suggests that this emerging serotype could represent a real threat among pneumococcal disease in the near future.