

Relationship between use of antimicrobials in orphanages and pneumococcal resistance: is the story so simple?

R.S. Kozlov¹, I.V. Gudkov¹, O.U. Stetsiouk¹, J.A. Poupard², L.S. Stratchounski¹

¹Institute of Antimicrobial Chemotherapy, Smolensk, Russia

²Pharma Institute of Philadelphia, Inc., Philadelphia, USA

Objectives: *S. pneumoniae* from children from orphanages are more resistant in comparison with clinical strains and those from day-care centers. A study was designed to evaluate possible influence of use of antimicrobials on resistance in strains from orphanages located in geographically distinct Russian cities.

Methods: Nasopharyngeal swabs were collected from 743 children < 7 years from 11 orphanages in 4 Russian cities (Moscow, Saint-Petersburg, Smolensk, Karachev). Susceptibility to penicillin G (PEN), amoxicillin (AMO), amoxicillin/clavulanate (AMC), cefuroxime (CEF), cefotaxime (CTX), erythromycin (ERY), azithromycin (AZI), clarithromycin (CLA), clindamycin (CLI), chloramphenicol (CHL), levofloxacin (LEV), tetracycline (TET), co-trimoxazole (SXT) was performed by microdilution (NCCLS). Profile of use of antimicrobials in previous 12 months was taken from case histories.

Results: A total of 399 *S. pneumoniae* were isolated with carriage rate from 36.1% to 75.9%. The prescription of antimicrobials varied from 31 courses/100 children/year in orphanage to 363 courses/100 children/year. Predominant use of the following antimicrobials seems to correlate with the non-susceptibility: PEN in orphanage No. 4 (18.9% of prescriptions vs. 78.9% of non-susceptible isolates), AZI in orphanage No. 7 and 11 (19.8% vs. 58.8% and 15.4% vs. 44.4%), SXT in orphanage No. 3 (18.9% and 34.6%). Frequent use of AMO and AMC does not seem to be associated with resistance to these compounds: e.g. 27.1% of use of AMC in orphanage No. 7 vs. 0% of resistance, 19.6% of use of AMC in orphanage No. 6 vs. 0% of resistance. Also use of parenteral beta-lactams (with exceptions of PEN) did not lead any significant changes in resistance of *S. pneumoniae*.

Conclusions: Frequent use of PEN, AZI and SXT has been associated with resistance of nasopharyngeal *S. pneumoniae* in orphanages. In contrast, in this study, use (of up to 27% of all agents used) of AMO, AMC does not seem to influence resistance of *S. pneumoniae*.