

Multidrug-resistant *Streptococcus pneumoniae* in young children

Multidrug-resistant *Streptococcus pneumoniae* (*S pneumoniae*) is one of the major causes of difficult-to-treat pneumococcal disease in young children. Prevalence of the pneumococcal disease has been declining globally after the introduction of the PCV13 pneumococcal conjugate vaccine.¹ Lo and colleagues² reported that the global dissemination of *S pneumoniae* serotype 24F lineage GPSC10 (CC230) was multidrug-resistant, which is a challenge for serotype-based vaccine strategy. The prevalence of serotype 24F lineage GPSC10 in Europe and the USA is well known, but has not been reported in any countries in Asia. Li and colleagues³ reported that 23F is the dominant serotype in paediatric patients in China. Non-PCV13 serotypes 11A and 24F have susceptibility for β -lactams and erythromycin, which is a concern after the emergence of SARS-CoV-2.⁴ PCV20 introduction might reduce the effect of antibiotic resistance for non-PCV13 serotypes 11A and 24F but antimicrobial surveillance is needed. We collected 1974 isolates of *S pneumoniae* from Jan 1, 2021 to Sept 24, 2022, of which 1191 (60%) were from boys and 783 (40%) were from girls (ie, paediatric patients) with a mean age of 2.4 years (median age 2 years; SD 2.06). Isolates were from different specimens: 1839 (93.16%) from sputum; 108 (5.52%) from bronchoalveolar lavage fluid; 14 (0.7%)

from venous blood; five (0.25%) from ear secretions; four (0.20%) from the nasal fold; and one each (0.05% each) from thoracic ascites, cerebrospinal fluid, and joint fluid (appendix 1). Antimicrobial susceptibility was analysed as per guidelines from the European Committee on Antimicrobial Susceptibility Testing, with *S pneumoniae* ATCC49619 used as the control strain. Our data revealed that *S pneumoniae* isolates had highest resistance to tetracycline (73.76% [n=1456]); then penicillin (61.75% [n=1219]); trimethoprim and sulfamethoxazole (54.41% [n=1074]); cefotaxime (7.14% [n=141]); erythromycin (3.90% [n=77]); chloramphenicol (2.79% [n=55]); ertapenem (2.03% [n=40]); and ceftriaxone (1.27% [n=25]). All isolates were sensitive to linezolid; moxifloxacin; piperacillin and tazobactam; and vancomycin. The intermediate resistance was highest to erythromycin (94.78% [n=1871]), ofloxacin (57.50% [n=1135]), levofloxacin (47.37% [n=935]), ertapenem (23.30 [n=460]), and meropenem (18.64% [n=368]); minimum inhibitory concentration shown in appendix 2). A similar resistance phenotype was reported in South Korea after the introduction of the PCV13 vaccine.⁵ Further studies on genomic characterisation are ongoing and will help in understanding the emergence of antibiotic-resistant lineages in China.

In conclusion, we identified that our *S pneumoniae* isolates have reduced susceptibility to tetracycline and penicillin, which is a major concern for paediatric patients in Shenzhen, China because amoxicillin is often the drug of choice for clinicians.

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See Online for appendix 1

See Online for appendix 2