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Genotyping and serotyping of macrolide and multidrug resistant Streptococcus pneumoniae isolated from carrier children

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Abstract: Aims: Streptococcus pneumoniae, an opportunistic pathogen commonly carried asymptomatically in the nasopharynx of children, is associated with increasing rates of treatment failures due to a worldwide increase in drug resistance. We investigated the carriage of S. pneumoniae in children 5 years or younger, the identity of prevalent serotypes, the rates of resistance to macrolides and other antimicrobial agents and the genotypes responsible for macrolide resistance. Materials and Methods: Nasopharyngeal swabs were collected from 157 children under 5 years for cultural isolation of S. pneumoniae. Antibiogram of isolates? was determined using the disk diffusion test, and the minimal inhibitory concentration to macrolides was determined using the E-test. Isolate serotypes and macrolide resistance genes, erm(B) and mef(E), were identified using multiplex polymerase chain reactions. Results: S. pneumoniae was recovered from 33.8% of children; 41.9% among males and 21.9% among females (P = 0.009). The highest carriage rate occurred among age groups 7-12 months and 49-60 months. Most frequent serotypes were 19F, 6A/B, 11A, 19A, 14 and 15B/C.? Resistance to macrolides was 60.4%. Resistance to oxacillin, trimethoprim/sulfamethoxazole and clindamycin was present among 90.6%, 54.7% and 32.1% of isolates, respectively. All isolates were susceptible to chloramphenicol, levofloxacin and vancomycin. Isolates resistant to one or more macrolide drugs were more likely to be multidrug resistant. Resistance to clindamycin or oxacillin coexisted with macrolide resistance. Among the erythromycin-resistant isolates, erm(B), mef(E) and erm(B) and mef(E) genes were present at rates of 43.8%, 37.5% and 6.3%, respectively. Erm(B) and mef(E) were associated with very high level and moderate-to-high level resistance to macrolides, respectively. Conclusion: A significant proportion of children harboured macrolide and multidrug-resistant S. pneumoniae.