Invasive pneumococcal disease and clinical implication of antimicrobial resistance in the conjugate vaccine era

Cheng-Hsun Chiu

Chang Gung Children's Hospital, Taiwan

Streptococcus pneumoniae (SP) is a major cause of invasive and noninvasive bacterial disease worldwide. SP can cause invasive diseases (meningitis, bacteremia, bacteremic pneumonia, peritonitis, and septic arthritis/osteomyelitis) or mucosal infections (otitis media, sinusitis). Both disease burden and antimicrobial resistance of SP were high in Asian countries. The incidence of invasive pneumococcal diseases (IPD) in Hong Kong, Japan, Singapore, and Taiwan were 15.6, 12.6, 13.6, and 14.7 per 100,000 children <5 yrs, respectively. A multicenter study in China was conducted in 2006-2008: 60% of invasive isolates was deri8ved from blood, 28% from CSF, 12% from pleural fluid. Thirty-nine percent of children were in < 2 years, 43% in 2-4 yrs and 18% in 5-14 yrs. Serotype coverage by different vaccines was PCV7 60%, PCV10 67% and PCV13 88%. PCV7 was introduced to US in 2000. After its routine use in US, IPD in children < 5 years caused by vaccine serotype SP decreased by 92%. Herd immunity in the elderly > 65 years was also noted. But prevalent serotypes have switched to non-vaccine types such as 19A in US as well as in other areas of the world. Many of the serotypes that have been emerging after the use of PCV7 are resistant to antimicrobial agents. Nowadays PCV13 is being used in most Asian countries in private sector only. The current epidemiology of IPD in these Asian countries under such sub-optimal pneumococcal immunization and the clinical implication of antimicrobial resistance in the treatment of IPD will be discussed by quoting data from Asian Network for Surveillance of Resistant Pathogens (ANSORP) study and island-wide prospective surveillance of IPD in Taiwan.