DRSP & CAP

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The evolution of pneumococcal resistance development during the past few decades with dissemination of multiply resistant clones particularly the Spanish 23F has now become a global issue. This poses a significant threat to the public health worldwide particularly in Asian countries where there was a continuous increase in the in-vitro resistance to beta-lactams, tetracyclines, and macrolides. The most common causative pathogen in patients with community-acquired pneumonia (CAP) is Streptococcus pneumoniae worldwide. Data from a prospective study previously performed in Hong Kong showed similar findings. In Hong Kong, currently >40% of pneumococcal isolates are nonsusceptible to penicillin in-vitro. Amongst them, 60-90% are also resistant to cotrimoxazole, erythromycin and tetracycline.

The clinical impact of drug-resistant S. pneumoniae (DRSP) depends on the level of antimicrobial resistance, the site and severity of the infection and risk factors in the host. The clinical relevance of DRSP has been widely debated. Even in geographical areas with high rate of DRSP, not all patients are likely to be infected. Risk factors for DRSP include age 65 years or over, alcoholism, beta-lactam therapy within the previous 3 months, and recent immunosuppresive illness or treatment for such illness, including steroid therapy. Organisms isolated from sputum and blood cultures are less commonly resistant than those isolated from the upper respiratory tract. Furthermore, most investigators have found no difference in mortality for CAP patients with sensitive (<0.1 mcg/mL) or intermediate-sensitive (0.1-1.0 mcg/mL) organisms after controlling for comorbid illnesses, using the currently defined levels of resistance under National Committee for Clinical Laboratory Standards (NCCLS). Available data show that mortality in CAP is adversely affected by DRSP only when MIC values to penicillin are >4.0 mcg/mL. The discrepancy between in vitro resistance and in vivo efficacy is partly due to the NCCLS breakpoint system to define in vitro resistance, which does not imply pharmacokinetic nor pharmacodynamic features of antimicrobial agents. For example, the target site concentration of the antibiotic such as endothelial lining fluid concentration in pneumococcal pneumonia. The recent CDC-proposed S. pneumoniae breakpoints for penicillin with sensitive strain as <1.0 mcg/mL and resistant strain as >4.0 mcg/mL will be more likely to reflect the clinical outcome with respect to beta-lactam therapy, an effective established therapy that one can rely as penicillin-resistant pneumococcal isolates with breakpoint >1.0 mcg/mL are uncommonly encountered in CAP in Hong Kong.