

1) Epidemiology of infectious diseases and antibiotic resistance in China

Institute of Respiratory Diseases, the First Affiliated Hospital
China Medical University, Shenyang, P.R. of China

○Jian Kang

Infectious diseases and the increasing threat of antibiotic resistance remain a major problem in China Today. Community-acquired pneumonia (CAP) and Hospital-acquired pneumonia (HAP) are most common infectious diseases in China.

A multicenter study on the pathogenic agents in 665 adult patients with CAP in China was published in Chinese journal in 2006. The results showed that pathogens were identified in 53.1% with valid serum samples and sputum cultures. The percentage of pathogens was as follows: *Mycoplasma pneumoniae* (20.17%), *Streptococcus pneumoniae* (10.13%), *Haemophilus influenzae* (9.12%), *Chlamydia pneumoniae* (6.16%), *Klebsiella pneumoniae* (6.11%), *Legionella pneumophila* (5.11%), *Staphylococcus aureus* (3.18%), *Escherichia coli* (1.16%), *Moraxella catarrhalis* (1.13%), *Pseudomonas aeruginosa* (1.10%).

A clinical survey on HAP in 16 Chinese teaching hospitals including 613 cases was performed from August of 2008 to December of 2010. The results showed that the pathogens of HAP were as follows: *Acinetobacter Baumannii* (29.85%), *Pseudomonas aeruginosa* (21.86%), *Staphylococcus aureus* (13.38%), *Klebsiella pneumoniae* (9.62%), *Candida albicans* (6.04%), *Stenotrophomonas maltophilia* (4.57%), *Escherichia coli* (3.26%), *Enterobacter cloacae* (2.12%), Coagulase-negative staphylococcus (1.79%), *Candida tropicalis* (1.17%).

The CHINET study is an antibiotic resistance multicenter surveillance in China. CHINET data in 2010 showed that a total of 1961 clinical strains of *Enterobacter spp.* were collected. The resistance rate of *Enterobacter* strains was the highest to ampicillin, cefazolin and ceftazidime (>93%), relatively higher to ceftazidime and cefotaxime (38.6% and 51.2%, respectively), and relatively lower to piperacillin-tazobactam, cefepime, cefoperazone-sulbactam, ertapenem, amikacin, or ciprofloxacin (generally <20%), and the lowest to imipenem and meropenem (5.2% and 4.8, respectively). Of the 5080 clinical strains of *Pseudomonas aeruginosa*, 91.2% were isolated from hospitalized patients, and 69.9% were isolated from respiratory tract. These *Pseudomonas aeruginosa* isolates showed the lowest resistance rate (15.3%) to amikacin. The percentage of the *Pseudomonas aeruginosa* isolates resistant to other antimicrobial agents was generally above 18%. The 5523 nonduplicate strains of *Acinetobacter* showed the lowest resistance rates to cefoperazone-sulbactam and minocycline (33.6% and 35.4%, respectively). About 62.1% and 63.6% of these strains were resistant to imipenem and meropenem, respectively.

A total of 5608 clinical isolates of Gram-positive bacteria were collected from 12 teaching hospitals across China from 2005 to 2010. Overall, the prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-resistant coagulase-negative staphylococci (MRSCoN) were 46.8% and 81.5%, respectively. Isolates from inpatients exhibited a higher rate of MRSA than that from outpatients (52.3% versus 26.2%, $P < 0.001$). The prevalence of MRSA in respiratory infections (67.5%) was higher than in other sources of infections ($P < 0.001$).

The resistance ratio of macrolides to *Mycoplasma pneumoniae* is very high in China. 53 clinical isolates from children in Shanghai City showed 83% isolates were highly resistant to erythromycin (MICs>128mg/L), azithromycin and clarithromycin. The other study containing 50 isolates from children in Beijing showed 92% isolates were resistant to macrolides. 67 isolates from adults with CAP in Beijing showed 69% isolates were resistant to macrolides.