

GUEST EDITORIAL

Community-acquired pneumonia: An Asia Pacific perspective



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INTRODUCTION

Community-acquired pneumonia (CAP) is a common illness that is potentially life-threatening especially in older adults and those with comorbid disease. Although many microorganisms can cause CAP, it is a small number of key pathogens that cause most cases. *Streptococcus pneumoniae* is the most frequently identified pathogen, with the highest incidence of this organism reported in studies that used urinary antigen detection. *Haemophilus influenzae*, atypical pathogens (*Mycoplasma pneumoniae*, *Chlamydia pneumoniae* and *Legionella pneumophila*) and viruses are the other commonly identified pathogens of CAP.^{1,2} Gram-negative bacilli (*Enterobacteriaceae* and *Pseudomonas aeruginosa*) are the causative agents in patients who have had previous antimicrobial treatment or who have pulmonary comorbidities such as bronchiectasis or COPD. Even when carefully sought for in prospective studies, the causative organism remains unknown in about half of the patients. Reasons for failure to identify the aetiological organism include previous antibiotic treatment, unusual pathogens that go unrecognized, viral infections and pathogens that are currently not recognized.

MICROBIAL AETIOLOGY OF COMMUNITY-ACQUIRED PNEUMONIA IN THE ASIA PACIFIC REGION

Studies conducted in Japan, Korea and Thailand showed that the aetiology of CAP is similar to that reported in the West except for the low incidence of *Legionella pneumoniae*.^{3–6} The low incidence of *Legionella* infection, also reported in the other Asian countries, could have been due to limitations of laboratory tests used. In a recent surveillance study conducted in 12 urban tertiary medical centres in Asia involving ambulatory and inpatients, infection rates based on a ≥ 4 -fold rise in antibody titre between acute and convalescent sera, were found to be 12.2% for *M. pneumoniae*, 4.7% for *C. pneumoniae* and 6.6% for *L. pneumophila*. The overall infection rate for these atypical pathogens was 23.5%.⁷ In our recent study on hospitalized patients, *L. pneumophila* was identified in 5.8% of the cases.⁸ *M. pneumoniae* and *C. pneumoniae* often cause a mild clinical disease, therefore patients are more likely to be treated as outpatients. Similar to reports from the West, *C. pneumoniae*, *M. pneumoniae* and *S. pneumoniae* were identified to be the most common aetiological agents in ambulatory patients in a Thai study, accounting for 37%, 30% and 13% of the cases, respectively.⁶ A study in Japan showed almost similar findings.⁹

A number of studies in Asia where the prevalence of tuberculosis is high have shown that infection due to *Mycobacterium tuberculosis* can commonly present as CAP.^{8,10–12} Melioidosis is endemic in South-east Asia and northern Australia. *Burkholderia pseudomallei* should be considered a causative organism in patients with CAP in rural South-east Asia particularly if the patient has diabetes mellitus.¹³ This organism was identified in 15.4% of hospitalized CAP patients in Khon Kaen in North-eastern Thailand¹³ while in urban Bangkok, it was identified in 1.4% of the cases.⁶ Similarly, in urban parts of Malaysia, melioidosis is uncommon.^{12,14} However, in patients admitted with severe CAP in South-east Asia, *B. pseudomallei* is a common causative organism especially if the patient is diabetic as shown by studies in Singapore and Khon Kaen.^{15–17} In the Asia Pacific region, Gram-negative bacilli other than *H. influenzae* such as *Klebsiella pneumoniae* are more frequently isolated.^{3,5,6,8,12–14} These geographical differences in the microbiology of CAP must be taken into consideration when selecting the appropriate antibiotics for initial empirical

therapy of CAP in this region. It was not too long ago that the Asia Pacific region was badly affected by the severe acute respiratory syndrome (SARS) caused by the SARS coronavirus and the region like the rest of the world is always vigilant on possible outbreaks of highly pathogenic H5N1 avian influenza.¹⁸

SEVERITY ASSESSMENT AND INITIAL SITE OF CARE

Practice guidelines normally categorize CAP patients based on the site of treatment (outpatient, general ward or intensive care unit), the presence of comorbidity and modifying factors (e.g. risk for penicillin-resistant *S. pneumoniae*).^{19,20} Each patient group is assigned a list of likely pathogens and suggested antimicrobial therapy that provide coverage of both the likely pathogens and resistant strains.

Severity assessment, made on the basis of prognostic criteria which include the patients' age, comorbidities, and physical, laboratory and radiographical findings, is the key to deciding the initial site of care. The use of the pneumonia severity index (PSI)²¹ for initial risk assessment has been endorsed by the Infectious Disease Society of America, Canadian Infectious Disease Society and Canadian Thoracic Society, and Australia therapeutic guidelines.^{19,20,22} There is a clear correlation between mortality and risk class. The risk of death is low for risk classes I–III (0.1–2.8%), intermediate for class IV (8.2–9.3%), and high for class V (27–31%).²¹ However, the PSI may not be practical for routine use in busy hospital emergency departments or primary care settings because of its complicated requirement for calculation of a score based on 20 variables of patient demographics (gender, age), residence, comorbid illnesses, initial vital signs and investigation results. Because the PSI gives high weighting to patient age and past history but lower weighting to potentially important clinical features such as hypoxia, young, previously well patients may be classified as having mild CAP (PSI classes I–III), despite being hypoxaemic and having clinically severe disease. Furthermore, the PSI is more useful for identifying low-risk patients who may be safely treated as outpatients rather than those with severe CAP. The 'CURB-65 score' (confusion, elevated blood urea nitrogen, elevated respiratory rate, low systolic or diastolic BP and age ≥ 65 years) is an alternative severity assessment tool which is simpler.²³ Patients are stratified into 3 groups according to increasing risk of mortality or need for admission for intensive care. CURB-65 is more focused on the severity of the episode of CAP rather than the patient's past history. The recently updated Japanese Respiratory Society guidelines recommend the use of a modified version of the CURB-65 score which include oxygen saturation by pulse oximetry as an additional parameter.²⁴ However, this new severity scoring system needs to be evaluated by prospective studies. Neither the PSI nor CURB-65 appears particularly useful for predicting accurately whether an individual patient will require intensive care unit admission. A recent Australian

study²⁵ suggests a modified version of CURB-65 as being more accurate for this purpose, but this is yet to be validated.

INCREASING RESISTANCE OF *S. PNEUMONIAE* TO ANTIMICROBIALS

In recent years, the proportion of penicillin non-susceptible strains of *S. pneumoniae* and the level of penicillin resistance have increased in many Asian countries.²⁶ Resistance of *S. pneumoniae* to other β -lactams and macrolide is also prevalent in many Asia Pacific countries. In fact, the prevalence rates of erythromycin resistance exceed 70% in several of these countries.²⁶ However, most investigators found no increase in mortality for patients infected with antibiotic-resistant *S. pneumoniae*, after controlling for comorbid illness, although patients infected by resistant organisms may have more severe disease and suppurative complications as well as a more prolonged hospital stay.^{27–29} Despite the widespread emergence of *in vitro* resistance, current antimicrobial regimens are mostly effective in the treatment of *S. pneumoniae* CAP.

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