EDITORIAL

Antibiotic Resistance in the Community

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There are three articles in this issue of the Medical Journal of Malaysia that are related to the issue of antibiotic resistance in the community[1,2,3]. The prevalence of antibiotic resistance in community-acquired pathogens is increasing world-wide[4]. Data on community antibiotic resistance, unlike similar data on nosocomial pathogens, are often not readily available. Nonetheless, such data are especially important for general practitioners who often have to treat their patients on an empirical basis without the benefit of microbiological reports. As an example, a recent report from Hong Kong on community acquired infections[5] revealed a high rate of resistance to fluroquinolones. Up to 35% of urinary pathogens (*E. coli, Proteus* and *Morganella*) were resistant to fluoroquinolones. Among strains of *Streptococcus pneumoniae*, over 80% were considered non-susceptible (MIC > 0.1 mg /L). All strains of *Haemophilus influenzae* were resistant to erythromycin and less than 40% were sensitive to ampicillin. All *Neisseria gonorrhoeae* isolates were resistant to penicillin, up to 79% to the fluoroquinolones, 15% to spectinomycin, but all were susceptible to ceftriaxone.

Such surveillance information would be of tremendous value to general practitioners to facilitate antimicrobial therapy. However individual countries would have to generate their own national data as resistance rates vary considerably between countries. Increasing trends of resistance to specific antibiotics can also serve as early warnings and national policies may then be taken to arrest or reverse such trends. An example of a successful intervention is in the case of Finland where a national effort to reduce the use of macrolides succeeded in lowering macrolide usage from 2.44 defined daily doses (DDD)/1000 inhabitants/day to 1.44 DDD/1000 inhabitants/day with an accompanying decrease in macrolide resistance in *Streptococcus pneumoniae* from 19% to 9% ($p < 0.001$)[6].

In Malaysia, no recent surveillance of community antibiotic resistance has been undertaken. The paper by Norazah et al1 sheds some light on the antibiotic resistance pattern of *Staphylococcus aureus* in our community. Although the numbers are small it is gratifying to note that no methicillin-resistant *Staphylococcus aureus* (MRSA) were detected. Community acquired MRSA is an emerging infection and has been reported in several countries including the United States, Canada, New Zealand and Australia[7]. In certain communities, MRSA has become even more prevalent than methicillin-susceptible *S. aureus* (MSSA). These strains are distinct from the hospital-acquired MRSA and appeared to have emerged in community *Staphylococcus aureus* through the acquisition of the *mecA* gene. Highly virulent strains are also more frequently encountered in community than in hospital-acquired MRSA.

The finding of multi-resistance in community *Staphylococcus aureus* in Malaysia, is however a matter of concern. There is a particularly high rate

of resistance to fucidic acid (11.8%). Fucidic acid is an antibiotic that is used to treat MRSA infections in our hospitals and the loss of this valuable agent will severely restrict our anti-MRSA armamentarium. Brown & Thomas[8] reported a similar marked increase, from 6% in 1998 to 11.5% in 2001, in fucidic acid resistance among methicillin-susceptible *Staphylococcus aureus* (MSSA) isolates in Bristol. Such an increase has been attributed to the increased use of fucidic acid topical applications in general practice.[9]

The paper by Lee and Puthucheary[2] describes the pattern of antibiotic resistance in *Shigella*, an important intestinal pathogen in developing countries. The report reveals a high rate of resistance to ampicillin, tetracycline and chloramphenicol. However, no resistance to ciprofloxacin, a fluroquinolone, was encountered and the resistance rates to gentamicin and ceftriaxone remains low. Among other enteropathogens, our National Antibiotic Resistance Surveillance programme had revealed that in 2000 10.6% and 8.5% of *Salmonella typhi* isolated in Malaysian government hospitals were resistant to ampicillin and chloramphenicol respectively. With non-typhoidal *Salmonella* the resistance rates recorded against ampicillin, chloramphenicol and cotrimoxazole were 12%, 6.3% and 13.2% respectively. However no resistance to fluoroquinolones have yet been reported.

Another area of worldwide concern in community antibiotic resistance is among the respiratory pathogens. Increasing resistance has been observed in *Streptococcus pneumoniae* and *Haemophilus influenzae*. One multinational, longitudinal surveillance programme (the Alexander Project) was established in 1992 to monitor the susceptibility of the major community-acquired lower respiratory tract pathogens to a range of antibacterial drugs[10,11]. This project has revealed a tendency towards increasing resistance of *S. pneumoniae* to penicillin and macrolide therapy. The prevalence of penicillin resistance among *S. pneumoniae* isolates is particularly high in certain countries of Europe (France and Spain) and Asia (Korea, Taiwan and Hong Kong). Macrolide resistance in *S. pneumoniae* is also a growing problem in some European countries where the prevalence of macrolide resistance now exceeds that of penicillin resistance. In Malaysia the prevalence of *S. pneumoniae* non-susceptible to penicillin is now nearly 40%. All strains however remain sensitive to amoxicillin-clavulanate[12].

There is a strong association between antibiotic usage and resistance and countries that have the highest per capita antibiotic consumption also have the highest antibiotic resistance rates. In this issue Teng et al 3 have shown, in a study of government health clinics in Negeri Sembilan, that there is overuse of antibiotics in the treatment of upper respiratory infections. A high proportion of patients received antibiotics despite the lack of clinical features to suggest a bacterial infection.

Such prescribing behaviour is a universal phenomenon. In one recent survey conducted in the United States both general practitioners and specialist infectious diseases physicians were more likely to use newer, broader drugs for the treatment of community acquired pneumonia compared to older agents still recommended by national guidelines and the issue of emergence of antibiotic resistance was ranked lowest among 7 determinants for their choice of antibiotics[13].

Improving antibiotic prescribing practices among doctors is not an easy task. The factors that contribute to overuse are varied and many. They include the altruistic instinct of the doctor to do the best for the patient, the misconception that antibiotics can do no harm, a deficiency of knowledge and clinical skills, the lack of information on local antibiotic sensitivity patterns and inadequate laboratory support. The undue influence of the pharmaceutical industry and patient pressure are also important factors. In a study conducted by the American Academy of

Paediatrics, 40% of the paediatricians polled admitted to at least 10 occasions in a month where patients had demanded for an antibiotic. Even when the doctors knew that antibiotics were inappropriate in those situations up to a third acceded to their patients' demands[14].

A multi-faceted strategy is required to improve antibiotic prescribing and control the emergence of antibiotic resistance. Education of both doctors and patients would form the cornerstone of the strategy. This should be supplemented by evidence-based clinical practice guidelines and audits to assess compliance with these guidelines. Attention should also be paid to non-medical uses of antimicrobials particularly in the agricultural sector. All stakeholders including government, professional societies and the public should be involved in formulating, implementing and reviewing the strategy. Antibiotic resistance is a major clinical problem all over the world and failure to take adequate steps to control the problem will have dire consequences for the entire human population.

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