

Antimicrobial Resistance: A New Beginning and the Need for Action

Sin Yew Wong,¹MBBS, MMed (Int Med), FAMS, Li Yang Hsu,²MBBS, MRCP, MPH

In this issue, the articles (historical, original and review papers) highlight the extent and problem of antimicrobial resistance in Singapore. The authors should be congratulated on their efforts. We hope that the research and viewpoints presented will not only inform but also stimulate debate on the opportunities and threats that face the medical community in Singapore.

The historical perspective on local gram-negative antimicrobial resistance provided by Koh reminds us that development of antimicrobial resistance tends to be progressive and cumulative.¹ Tambyah and co-workers' account on methicillin-resistant *Staphylococcus aureus* (MRSA) at the local university hospital delivers a stark warning about the rapidity with which drug-resistant microbes may become entrenched in a new hospital with inadequate infection control processes – and there are at least 3 new hospitals on the horizon in Singapore.² Data from overseas have demonstrated that antibiotic resistance can be reduced with multi-pronged efforts, but these resistance levels rarely return to the earlier baseline.³

Newer threats in antimicrobial resistance have emerged locally in recent years, and the most prominent are vancomycin-resistant *enterococci* (VRE) and multidrug-resistant non-fermentative gram-negative bacilli (*Acinetobacter* spp. and *Pseudomonas aeruginosa* in particular). Whereas extensive infection control and administrative efforts have kept VRE incidence rates low,⁴ the same cannot be said for the non-fermenters.^{5,6} Because of the high incidence of the latter problem, both local and international usage of an older class of antibiotics – the polymyxins – is increasing, and Kwa and co-workers' review of these drugs is therefore timely.⁷

This response reinforces the point that, for far too long, the medical community has believed that antimicrobial resistance was a problem for which the pharmaceutical industry would readily provide new solutions. Unfortunately, the pipeline for agents with novel modes of antimicrobial target activity has diminished severely. Clearly, we need to use our current available antibiotics more wisely.

The research and reviews presented in this issue of the *Annals* also clarify gaps in our knowledge, and highlight an urgent need to improve the status quo. We do not have sufficient data on the impact of antimicrobial resistance in the community, intermediate care hospitals, dialysis centres, or in long-term facilities such as nursing homes. This “scientific data deficit” needs to be urgently addressed so that effective public health policies can be developed.

It is often overlooked that most antimicrobial prescribing and consumption occurs in the outpatient setting; likewise we appear to have ignored this area of study. While there is a clear connection between antimicrobial consumption and the level of resistance, the relation is a complex one. In addition to the total quantity of antimicrobial agents used, the specific types of antimicrobials are probably important, and the fitness cost derived from resistance mutations varies between different bacterial strains.⁸ Therefore, much work needs to be done to close these gaps in Singapore.

A new equilibrium in antimicrobial prescribing, and therefore a new approach, is necessary. First and foremost, community-based data on antimicrobial resistance and prescription are critical, if we are to influence prescribing habits in the outpatient setting. Moving forward on this will require governmental support, but not to the extent that such commitment will be seen as being blunt or intrusive. In the family practice setting, newer methods of continuing medical education on infections and antibiotic prescribing will need to be developed. Suffice to say that we need to move away from current models of pharmaceutical industry-directed educational activities.

At the very least, a concerted effort on public education should be rapidly implemented. National and international campaigns to reduce inappropriate antibiotic use have had some success.⁹ We need not re-invent the wheel. The professional bodies, such as the Singapore Medical Association, College of Family Practitioners, and the Academy of Medicine will need to take up this challenge. An important start is the recent position paper, endorsed by several professional medical societies in Singapore, that addresses the role of antimicrobial stewardship in the fight

¹ Gleneagles Medical Centre, Singapore

² Department of Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

Address for Correspondence: Dr Wong Sin Yew, Infectious Diseases Partners Pte Ltd, 6 Napier Road #10-03, Singapore 258499.

Email: symswong@singnet.com.sg

against antimicrobial resistance.¹⁰ We now need concerted action.

Perhaps we also need to learn from the successful marketing methodology of pharmaceutical companies, and turn them through 180 degrees to improve prescribing habits for antimicrobials throughout the medical community. Some cautionary statements are appropriate, however. Overzealous efforts in educating family practitioners that “all fevers encountered are viral in aetiology and therefore not requiring antimicrobials” are misdirected.

Information support to assist in decision making is vital, with community-based data on antimicrobial resistance and rapid diagnostic tests being 2 important pillars of such an initiative. Indeed, multifaceted campaigns on appropriate antimicrobial use that have targeted both physicians and patients can decrease inappropriate prescribing without increased harm.¹¹

The silent threat of antimicrobial resistance is merely the tip of the iceberg. Unfortunately, this problem has not featured on the radar screen of public health officials in Singapore until very recently. However, with a rising healthcare expenditure, the problem will attract scrutiny, particularly with an increasing volume of published information on the costs (both direct and indirect) of antimicrobial resistance. Politicians overseas have already gotten into the act – one “plank” in the Labour Party’s campaign in 2004 was to reduce MRSA infection rates in the United Kingdom by 50% in 2008, a goal that they have only just managed to achieve.¹²

The numerous authors who have highlighted the extent of antimicrobial resistance in Singapore represent the new beginning. The facts must galvanise us into specific action to combat antimicrobial resistance. The challenges are to achieve a meaningful reduction in unnecessary antimicrobial use, and to decrease antimicrobial resistance without

adversely affecting the management of bacterial or fungal infections, or both.

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