

Some challenges in bacterial infectious diseases

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Professor Wasserman has an interest in innovative diagnostic techniques that can be effectively implemented in a limited resource environment, in the pathogenesis of staphylococcal infection, and also in medical education.

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We are aware of the enormous burden of infectious diseases in sub-Saharan Africa. The onslaught of HIV and its accompanying infections such as tuberculosis poses an all-encompassing burden on our health care system and a challenge to our resources and resourcefulness.

Infection occurs when pathogens overwhelm the immune response of the host. This happens when a particularly virulent pathogen is encountered, or when a large number of organisms are introduced into a site or overgrow as a result of disturbance of normal flora. The outcome is determined by the ability of the local and/or systemic immune defences of the host to deal with such an onslaught.

The balance between pathogens and hosts is therefore ever changing, driven by the evolution of both pathogen and host characteristics.

Social events like population movement and the hosting of major sporting events enhance the complexity of the epidemiology of transmissible infections, while advances in diagnostic techniques and management modalities continuously change our ability to combat disease.

This cumulates in the growth of new and essential knowledge that needs to be constantly assimilated by the practitioner so that he or she is able to deal effectively with a broad spectrum of infectious diseases.

Apart from problems associated with the management of individual patients, other issues concerning infectious diseases need to be addressed on a national scale by constant vigilance and focused research. We have to be alert and able to identify outbreaks of not only new pathogens, but also altered pathogen characteristics, for example the emergence and spread of multi-resistant tuberculosis in our communities and hyper-virulent and highly transmissible outbreaks of community-acquired *Staphylococcus aureus* that are currently occurring in many parts of the world. We need to strengthen infection control in hospitals and in the community, and to enhance our now well-established networks of pathogen surveillance that are providing essential information on the ever-changing landscape of infectious diseases in our communities (see the GERMS-SA website at <http://www.nicd.ac.za/units/germs/germs.htm>).

There are enough problems in the field of infectious diseases to fill several issues of this journal, but in this issue we bring together the expertise of leading local medical microbiologists and clinicians working in the field of infectious diseases to inform some of the day-

to-day dilemmas practitioners have to deal with when diagnosing and managing infection.

Slightly more than a decade ago, vaccination against invasive *Haemophilus influenzae* disease was rolled out in children. Last year, a vaccine against the more dominant serotypes of *Streptococcus pneumoniae* was also introduced into the South African vaccination schedule. Nevertheless, bacterial meningitis remains a dominant cause of child mortality and the impact of these vaccines needs to be carefully monitored in our population. Dr Anne von Gottberg of the National Institute for Communicable Diseases updates us on the vaccines and their current and future impact on infection with the capsulated pathogens.

In the light of the mobility of our population and the tourist boom surrounding the 2010 FIFA World Cup, Professor Marc Mendelson and his colleagues working at the Division of Infectious Diseases and HIV Medicine at Groote Schuur Hospital highlight some of the more common and serious diseases we may encounter in travellers.

Significant advancement towards the early diagnosis of tuberculosis has been made, and more rapid testing is now being rolled out by the National Health Laboratory Services as well as laboratories servicing the private sector. Marc Nicol, Professor of Medical Microbiology at the University of Cape Town, has been involved with the development and evaluation of many of these initiatives. He provides guidelines on the application and limitations of these tests, and gives us a glimpse of what can be expected in the near future.

Soft-tissue infections remain one of the most common and often difficult to treat infections encountered by the general practitioner. Professor Jan Pretorius, from the Department of Surgery at the University of Pretoria, gives a clear perspective on the different forms of complicated and serious soft-tissue infections. He explains the underlying pathogenesis of each form, and provides us with sound guidelines to diagnosis and effective management.

Dr Jantjie Taljaard of the Centre for Infectious Diseases at the Stellenbosch Faculty of Health Sciences provides an overview of the risk factors, management and complications of infections resulting in sepsis.

Finally, Dr Marthinus Senekal of Pathcare Laboratories provides 'in a nutshell' guidelines to use and interpret antimicrobial sensitivity testing and to direct duration of therapy.