Clinical and Translational Mycology on the southern shores: perspective from the Australia and New Zealand Mycoses Interest Group

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The hosting of the 19th International Society of Human and Animal Mycology (ISHAM) Congress, the premier international forum for medical, veterinary and basic science mycology, in Melbourne, Australia in 2015, has prompted the opportunity to journey through the beginnings and rationale of coordinated and systematic study of clinical and applied mycology in Australia. The Australia and New Zealand Mycoses Interest Group (ANZMIG) is a special interest group of the Australasian Society for Infectious Diseases (ASID). This year, it has the honour of hosting, and the scientific organisation of, the 19th ISHAM Congress, which includes symposia sessions co-badged with the Mycoses Study Group, USA and the International Immunocompromised Host Society. Australian speakers make a strong contribution to the program in Clinical, Translational, Basic Science and One Health streams.

History and beginnings

The driving force behind the first ANZMIG meeting in 1997 was Emeritus Professor David H Ellis, then, Head of Mycology at the Women’s and Children’s Hospital, Adelaide and Ms Jennifer Antonino, area manager for Australia and New Zealand, Nexstar Pharmaceuticals who provided support and the first iteration of ANZMIG, the Mycoses Interest Group (MIG), was born. Starting with 8 members (including the authors), interest in MIG steadily increased and its name changed to ANZMIG to reflect the contributions of New Zealand colleagues. The inspiration of Professor Ellis and founding support from Ms Antonino and Nexstar Pharmaceuticals, through all the initial teething problems, cannot be overstated.

Today, ANZMIG scientific and business meetings are held every quarter in a major city and membership has expanded to represent scientists and veterinarians active in mycology but the focus is still on clinical and epidemiological aspects of mycology. Meetings are supported in part by each of Gilead Sciences, Pfizer and MSD Australia, with Astellas also becoming a sponsor in 2015. Registrars in training are encouraged to attend the scientific sessions, and three are selected to present cases or discuss their work. By prior arrangement, their presentation and literature review can be accredited by the Infectious Diseases Specialist Advisory Committee, Royal Australasian College of Physicians (RACP) as a project. ANZMIG activities are headed by a chair, immediate past chair, scientific chair and secretary.

Objectives and professional standing

ANZMIG has two main objectives. It is a professional body to facilitate the conduct of national mycology surveillance and clinical trials, including antifungal drug trials and antifungal guideline development. Its other primary goal is to promote and improve education in all aspects of mycology including the delivery of such education outside of Australia in the Asia Pacific region. Laboratory capacity building and training of scientists is likewise actively promoted. A summary of both its educational and clinical/translational research activities is given below.
**Education**

ANZMIG has conducted regular education programs, firstly as wet laboratory workshops at the Women’s and Children’s Hospital, Adelaide, Westmead Hospital and Concord Hospital, in Sydney. The biennial Mycology Masterclasses, beginning in 2003, are a focus for mycology in Australia. Comprising a mix of basic, translational and clinical mycology as well as a relaxed and convivial atmosphere conducive to debate and discussion, these classes appeal to trainees and laboratory scientists, and include participation from haematology, intensive care and organ transplantation specialists seeking to update their knowledge. There has always been a waiting list for attendance. They are now coordinated by the current Secretary of ANZMIG, Dr Sarah Kidd, Head, National Mycology Reference Centre, SA Pathology. The 2015 Masterclass will be held in conjunction with the 19th ISHAM. Mycology Masterclass members are also faculty for the Asia Pacific Mycology Masterclasses supported by Merck since 2012. Many fruitful collaborations and exchanges of ideas have resulted from the Asia Pacific Mycology Masterclass. Its members also act as faculty for the Gilead CARE program on improving education and management of fungal infections.

ANZMIG has organised a popular session at the annual scientific meeting of ASID for 15 years and awards an annual prize for the best mycology abstract at that meeting. Its members also make active contributions to Australian Society for Microbiology and Australian Society for Antimicrobials and ASID clinical trials network.

**Mycology surveillance**

A major legacy of ANZMIG has been the collaborative network established for studies which have defined the epidemiology of serious fungal infections in Australia. This began with The Australian Candidemia Study in 2000 to which almost all microbiology laboratories in Australia contributed, and which resulted in publications describing the general epidemiology. Special groups such as paediatrics, cancer, solid organ transplantation, intensive care and uncommon species were also described; essential data for developing antifungal guidelines for invasive candidiasis was described. A rich repository of well-characterised bloodstream isolates was established, curated by Westmead hospital and SA Pathology and available for future research. Recently the new CLSI breakpoints have been examined against this data set. A follow-up to this study is underway now and we will compare epidemiology, susceptibility and outcomes to the earlier data.

An important local fungus *Scedosporium* spp., was chosen for the second epidemiological study and application of molecular testing to isolates allowed identification and clinical characterisation of *Scedosporium aurantiacum*, a relatively new species for which there was little clinical information including that of treatment.

Moulds other than *Aspergillus* were the focus of a more recent study (ongoing), showing that Mucormycetes were the most common, closely followed by *Scedosporium* species and identifying the need for more rapid diagnostic tests and definitions targeted to patients without classical immunocompromise.

*Cryptococcus gattii* epidemiology, another fungus well known in Australia was also described. Important prognostic factors were identified for the first time and treatment responses characterised.

Although not ANZMIG studies, two successful NHMRC grants entailing several million dollars evolved from the ANZMIG collaborations: one a randomised trial of *Aspergillus* PCR and galactomannan (GM) as early diagnosis for aspergillosis in high risk haematology patients compared to standard diagnostic methods. This study showed the safety of this approach. A second grant related to risk prediction for candidemia in the ICU is ongoing. Australian and New Zealand mycology suffers the same underfunding and low profile described internationally and the ANZMIG group is working to improve NHMRC grant outcome funding.

**Antifungal guideline development**

ANZMIG members led the steering and writing groups for Australian and New Zealand Consensus guidelines for antifungal agents in the haematology/oncology setting. These guidelines were first published in 2004 as a standalone paper and updated in 2008 as a supplement consisting of six separate articles. When recently compared with other international antifungal treatment guidelines, the 2008 guidelines ranked the highest overall when the Appraisal of Guidelines Research and Evaluation (AGREE) criteria for assessing the quality and methodological rigour of guidelines was applied. A recent survey of antifungal drug prescribers also highlighted the clinical relevance and applicability of the previous guidelines. These guidelines were updated most recently in 2014 and linked to Therapeutic guidelines Australia, the standard national hospital-wide antimicrobial prescribing guide.

The 2014 guidelines are the most comprehensive yet, incorporating nine sections and including recommendations for paediatrics, *Pneumocystis jiroveci*, *Cryptococcus gattii* as well as a survey of current diagnostic and prophylaxis practices. Members of ANZMIG have contributed to other guidelines such as the International Society for Host and Lung transplantation.

After a slow start, and under the valuable mentorship of David Ellis, ANZMIG has expanded and been a successful collaborative group promoting education and research and education in...
Mycology within Australia and our region. Attendance at the scientific sessions is open to all and is encouraged. Over the years, ANZMIG has had the honour of visiting clinicians, hospital scientists and academics attend, always imparting valuable advice to both the scientific content and business end of the special interest group. A continued goal is to increase the profile of mycology and improve grant funding success in this relatively neglected area.

Acknowledgements

References

Biographies
Professor Monica Slavin is Head, Department of Infectious Diseases, Peter MacCallum Cancer Centre in Melbourne and leads the Immunocompromised Host Infection Service at Royal Melbourne Hospital. Her major research interest is in infections in the immunocompromised, especially patients with cancer and undergoing transplantation, with a focus on prevention and early treatment of invasive fungal infection. She is current chair of the Australia and New Zealand Mycoses Interest Group, ASID.

Associate Professor Sharon Chen is a Medical Microbiologist and Infectious Diseases Physician at the Centre for Infectious Diseases and Microbiology (CIDM), Westmead Hospital, with research interests in medical mycology, new diagnostic tests in microbiology and laboratory automation. She is currently the Director of CIDM-Laboratory Services at the ICPMR, Pathology West, and past chair and scientific chair of the Australia and New Zealand Mycoses Interest Group, ASID.