NEW CLASSIFICATION OF MEDICALLY IMPORTANT FUNGI

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Fungal species are currently undergoing extensive reclassification, resulting in name changes to medically important species. There are several reasons for this:

1. The removal of the provision for fungi to have different names for anamorph and teleomorph forms from the International Code of Nomenclature for algae, fungi and plants (ICN). Rationalisation of existing species with dual-nomenclature is triggering some name changes, e.g., *Penicillium marneffei* is now *Talaromyces marneffei*.
2. Widespread application of molecular phylogenetic studies has redefined species concepts, with many species being realigned into related genera, e.g., *Scedosporium prolificans* is now *Lomentospora prolificans*.
3. The discovery of genetically distinct 'cryptic species' within morphological 'species complexes' requires careful consideration of how these species/complexes should be reported. For example, the *Aspergillus fumigatus* complex comprises >33 morphologically indistinguishable species, ten of which are clinically significant with variable antifungal resistance profiles, e.g., *Aspergillus lentulus*.

Laboratories and clinicians are strongly encouraged to adapt to nomenclature changes utilising explanatory comments on lab reports, to avoid confusion over organism identity, and maintain consistency in the literature, identification databases, and anti-biograms. The Mycology QAP provides an annual list of fungal species that includes details of name changes; commentary is also provided to participants through survey reports.

UPDATE ON ANTIFUNGAL SUSCEPTIBILITY: CLSI FOCUS

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The Clinical and Laboratory Standard Institute (CLSI) is currently focusing on two main areas: (1) drafting the epidemiological cut-off value (ECV) document, which is being undertaken by a Working Group, and (2) determining the issues associated with caspofungin methodology. In this lecture, I will focus on ECV since there is a need to educate our community about this value and get feedback from this community.

How does ECV differ from clinical breakpoint (CBP)? While CBP provides MIC concentrations that indicate whether the patients will respond to treatment, ECV distinguishes between organisms without and with phenotypically expressed resistance mechanisms for a species and a drug in a defined test system.

Moreover, within a species, it is the highest MIC of organisms lacking phenotypically expressed resistance. Additionally, ECV defines the upper limit of 'wild type' MIC distribution with no acquired resistance mechanisms.

What is the utility of ECV? ECV can be helpful in a number of ways including: (1) as a tool in the determination of clinical breakpoints, (2) to avoid dividing wild type MIC distributions of important target organisms, (3) as a surrogate clinical breakpoint when Pk/Pd data is incomplete and clinical data pertain only to wild type organisms, (4) for sensitive detection of (screening for) resistance, (5) for surveillance of antimicrobial resistance when CBPs are (a) not sensitive enough, (b) have not been determined, (c) change over time, and (d) to exclude resistance.

In summary, concerted efforts are directed at defining and understanding ECVs by CLSI and EUCAST. Both organisations have established working groups to bring this concept to the microbiology laboratories and to our clinicians.

EMERGING VIRAL ILLNESSES – PREPAREDNESS, TESTING AND ASSURING SAFETY

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Background: The possibility of a major infectious illness spreading through Australia includes infections such as SARS, avian influenza, pandemic influenza, Ebola virus (EBOV), MERS-CoV, and Zika virus (ZIKV). To date, only two (pandemic influenza, SARS) have resulted in cases in Australia. Such emerging infections may be clinically unrecognised early on, confused with background infections, emerge precipitously, and propagate through the population rapidly. They may be zoonotic pathogens infecting via novel contact (EBOV), changes allowing human infectivity (avian influenza), or newly emerged pathogens, often zoonotic (SARS, ZIKV, MERS-CoV).

Methods: Emerging viral illness response involves diverse skillsets – surveillance, epidemiology, modelling, public health, media, political engagement, as well as clinicians, diagnostics, and research and development. Reducing impact of emerging viruses involves preparedness including surge capacity, methods in place for detection (diagnostic capacity for known and new agents, sequences), surveillance capabilities, and quality assurance (QA) processes.

Discussion: The medical consequences of pandemic incidents would potentially be catastrophic, unless measures are taken to strengthen preparedness (surveillance, trained workforce, processes in place, surge capacity), prepare diagnostic capacity, and have documented processes. Medical personnel, public health officials, and government agencies that deal with emergency responses must be prepared. A coordinated response, integrating the above agencies listed above, with research capacity, are essential.