Opinion

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Inadequate Procedures for Antifungal Stewardship

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Description

Outcomes for invasive fungal infections have greatly improved in the past decade, and several new antifungal drugs have been or will be licensed in the next few years. Early accurate diagnosis and appropriate treatment have major impact on survival. In a 1995 survey of laboratory practice in the UK for mycology, major disparities were seen, with many laboratories not undertaking even simple diagnostic procedures.

Invasive Candidosis

Delays in processing and inadequate procedures for handling samples, incomplete or delayed reporting of results, or a combination of these, compromise the care of patients. In randomised trials of antifungal chemotherapy, optimum treatments and good alternatives for others have been defined for some infections. High-quality care requires a multidisciplinary approach to diagnosis and management. In this review, we propose microbiology, histopathology, radiology, and clinical auditing standards, with the evidence base for each reviewed. The standards are absolutes, and, therefore, provide a straightforward basis for improving services to patients if they are all implemented.

Invasive filamentous fungi infections resulting from inhalation of mold conidia pose a major threat in immune compromised patients. The diagnosis is based on direct smears, cultural symptoms, and culturing fungi. Airborne conidia present in the laboratory environment may cause contamination of cultures, resulting in false-positive diagnosis. Baseline values of fungal contamination in a clinical mycology laboratory have not been determined to date.

Invasive Candidosis (IC) has a significant impact on morbidity, mortality, length of hospital stay, and healthcare costs in critically ill patients. The overall mortality for these patients is high. Candidaemia increases mortality rates in the range of 20-49% and the attributable mortality has been calculated to be around 15%.

A nationwide US surveillance study demonstrated that the crude mortality rate of IC was 47% for patients in Intensive Care Units (ICUs) and 29% for patients in a hospital ward. In a multicentre study of ICUs in France from 2005 to 2006, the mortality associated with IC in ICUs was also high (45.9%).

In a previous European Confederation of Medical Mycology (ECMM) prospective multinational study performed in seven European countries, the rates of candidaemia ranged from 0.20 to 0.38 per 1000 hospital admissions. Intensive care treatments accounted for about 40% of all episodes of candidaemia in various surveys conducted in Europe. Moreover, two recent European studies documented the significance of fungal diseases in the intensive care setting.

Although Candida albicans is still the main cause of IC, a shift towards non-albicans species in some patients and age groups has been observed over the past two decades. Numerous large surveillance studies have provided important information regarding the epidemiology of candidaemia. However, information in particular on surgical patients in ICU remains scarce. Therefore, the ECMM initiated a prospective multicentre survey on IC in surgical patients in ICU. The aims of the survey were to expand our knowledge of the characteristics of surgical patients with IC in ICU to understand the epidemiology of IC and to determine which factors are associated with mortality.

A 1-year prospective survey of air and surface contamination was conducted in a clinical mycology laboratory during a period when large construction projects were being conducted in the hospital. Air was sampled with a portable air system impactor, and surfaces were sampled with contact Sabouraud agar plates. The collected data allowed the elaboration of Shewhart graphic charts.

Antifungal Stewardship

Mean fungal loads ranged from 2.27 to 4.36 colony forming units (cfu)/m3 in air. Strict control procedures may limit the level of fungal contamination in a clinical mycology laboratory even in the context of large construction projects at the hospital site. This is critical to the appropriate management of the fungal risk in hematology, cancer and transplantation patients.

An overview of current trends in Latin American experimental medical mycological research since the beginning of the 21st century is done. Using the PubMed and LILACS databases, the authors have chosen publications on medically important fungi which, according to our opinion, are the most relevant because of their novelty, interest, and international impact, based on research made entirely in the Latin American region or as part of collaborative efforts with laboratories elsewhere. In this way, the following areas are discussed: Molecular identification of

fungal pathogens; molecular and clinical epidemiology on fungal pathogens of prevalence in the region; cell biology; transcriptome, genome, molecular taxonomy and phylogeny; immunology; vaccines new and experimental antifungals.

The European Society of Clinical Microbiology and Infectious Diseases (ESCMID) and European Confederation of Medical Mycology (ECMM) wanted to tackle a challenge that no major scientific society had tried: providing a guideline on the diagnosis and management of rare and emerging fungal diseases. This guideline would obviously exclude Candida and Aspergillus diseases. Practically all Invasive Fungal Diseases (IFD), including invasive candidiasis and aspergillosis, appear to be rare and emerging infections by definition. Although many IFD are still numerically rare, physicians treating immunosuppressed patients are increasingly confronted with a wide variety of fungal pathogens. Rarity of disease is defined by their absolute frequency in a population, and definitions range around 1 in 2000. Of course these statistics are different for populations of severely ill patients, where frequencies of IFD are much higher.

In the context of the numerically increasing patient population with immunosuppression and the expanding use of antifungal agents against common pathogens such as Candida and Aspergillus, the number of patients with IFD due to emerging and often drug-resistant pathogens is rising.