intraocular fungal lesions, further highlighting the importance of considering the corneal reference when evaluating the findings of second microbial agents.

5.1d Challenges in diagnosing and management of invasive fungal diseases during the pandemic

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5.1.4 Fungal infections in Asia, bringing it out of the dark, September 22, 2021, 11:20 AM - 12:30 PM

Invasive fungal diseases have been increasing in Asian countries. Recent advances in medical care such as solid organ and stem cell transplantations, chemotherapy for cancer treatment, and contactless treatment, resulted in the increased prevalence of invasive mycoses. Invasive aspergillosis, mucormycosis, and endemic mycoses are among the most common mold infections in Asia. Non-clinical and non-renal risk factors of invasive fungal diseases have been increasingly recognized in Asia. In contrast to the classical neutropenic patient, most of the patients with invasive mycoses who had non-clinical risk factors were mostly non-neutropenic and may present with an atypical clinical manifestation. These non-risk factors include biological agents or vaccination and underlying conditions, such as cancer treatment, previous surgery, immunosuppressive, or immunosuppressive disease 2019 (COVID-19) pneumonia. Reactively, COVID-19-associated aspergillosis (CAPA) and COVID-19-associated mucormycosis (CAM) have been described. These particular mold infections had high mortality. Treatment of CAPA and CAM is often challenging because of the resistances to antifungal treatments. However, the interaction between transcription factors and drugs used for the treatment of COVID-19 must be taken into consideration.

Temporally and accurate diagnosis are crucial for the management of invasive fungal infections. Conventional fungal cultures from medical samples of blood or tissue are but they are time-consuming. Nevertheless, the diagnosis of invasive mold infections is challenging as the imaging is non-specific and the serological tests are not readily available in Asian countries. In some circumstances such as those with non-clinical risk factors, serology revealed abnormally low humoral or molecular tests are also the same needs among Asian countries for timely and accurate diagnosis of invasive fungal diseases. Several factors should be considered for the appropriate choice of antifungal agents, including antifungal coverage, adverse effects, underlying diseases, drug-to-drug interactions, and cost. Recently, non-clinical fungal agents such as glucans or new classes of antifungal agents have been studied and may be a promising choice for the treatment of invasive fungal infections.

5.1d Cryptococcus qPCR assay: the future for routine mycology labs and clinical trials dealing with cryptococcus

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5.1.4 Fungal infections in Asia, bringing it out of the dark, September 22, 2021, 11:20 AM - 12:30 PM

Background: Routine laboratory testing for cryptococcal meningitis currently consists of Cryptococcus antigen (CAg) testing in blood and cerebrospinal fluid (CSF), CSF India ink, and CSF fungal cultures. Quantitative cryptococcal culture (QCC) is labor-intensive and not feasible in most settings.

Objective: We evaluated quantitative (qPCR) and reverse transcription (RTP-PCR) assays to quantify cryptococcal load in CSF, plasma, and blood. We also investigated the dynamics of fungal DNA and RNA detection during antifungal treatment.

Methods: We developed a qPCR assay that differentiates Serotype A, B, and C of Cryptococcus neoformans and C. gattii based on the amplification of a unique nuclear Quacrom sequencing probe (QPR) and a multiplex 28S RNA gene and evaluated the assays on 205 patient samples from the AMETTE trial in Benin/Benlar and Malou (2019-2021). CSF, plasma, and whole blood were stored at −80°C and used for DNA analysis. Moreover, a total of 202/209 sterile patient samples (85 from Benin, 124 from Malawi), were used. For QPCR (QPCR nested in CSF, 188.3% (37% were) Serotype A, 28 (14.6%) were Serotype B, and 5 (2.8%) were a mixed infection of Serotype A and B. There was no amplification with 10 (5.7%) samples. There were no differences in fungal loads of D0, D7, and D14 between Serotypes A and B with the QPCR assay, and QQC showed a good correlation with qPCR quantification with QPCR (slope = 0.797, R2 = 0.73) and with 28S RNA qPCR (Slope = 0.771, R2 = 0.778) assays. The fungal load at D0 was significantly higher in patients who died at week 2 (22,7) and at week 6 (16) compared to patients who were alive at post-week 10 (25, 11). On the whole, the greatest difference in initial fungal load to both treatment regimens (P = 0.35). Detection of Cryptococcal DNA (28S RNA qPCR) in plasma or whole blood within the first 24 h of treatment was significantly associated with mortality or survival at D6 (P = 0.01). QPCR RTP-PCR assay allowed the detection of DNA was due to viable fungal cells as the quantification of QPCR whole nucleic acids was symmetrically higher (X2) to than of DNA.

Conclusions: Quantification of C. neoformans and C. gattii load in CSF and plasma at D0 is useful in identifying patients at risk of death and may be a promising tool for monitoring treatment response in the future.

5.1.5 Epidemiology of mycotic keratitis in developing countries

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5.1.5.1 Mycotic keratitis, September 21, 2021, 11:00 AM - 12:10 PM

Mycotic keratitis (corneal infection due to a fungal etiology) is a well-recognized ophthalmological emergency warranting rapid initiation of specific antifungal therapy. However, the magnitude of the problem of mycotic keratitis in the community, especially in the Indian subcontinent and the developing world, is, however, less apparent. A national annual incidence estimate of 1051, 787 cases (23.6/100,000 population) (globally) has recently been reported, with the highest rates being in Asia (133/100,000 popul 0.001, absolute number of 539 899) and Africa (13/100,000 popul 75 196), if all culture-negative cases are assumed to be fungal, especially where the incidence of mycotic keratitis is known to be high, then the annual incidence would be about 1408 956 cases. A fungal etiology has been found to account for a very high proportion (%) of 45% of microbial keratitis cases worldwide. A multicentre, retrospective, observational study on the prevalence of fungal keratitis noted that the incidence of fungal keratitis nearly double to about the equal. Interestingly, the proportion of microbial keratitis patients with a proven fungal etiology shows a significant negative correlation with the gross domestic product per capita. Although it is clear that the most common fungal etiological agents in Asia are identified in multiple studies in multiple solid and liquid media culture methods.

Results: A total of 404 fungal isolates were recovered from the corneal scraping of 204 patients suspected microbial keratitis. Of the 404 fungal isolates, Fusarium spp (135) were the predominant isolates, followed by Aspergillus fumigatus (111) (Aspergillus flavus (70) and Aspergillus niger (41)), Cladosporium spp (15), Candida albicans (11), and Rhizopus nigricans (1). The results identified that Fusarium species are the most common fungal isolates and are likely to be the major cause of fungal keratitis.

Conclusions: A retrospective review was performed of microbiological data relating to corneal scraping performed over a period of 11 years (January 2011-December 2021) in 1200 individuals who presented with suspected microbial keratitis. Each individual underwent corneal scraping and the scrapings were cultured on media to identify fungal or bacterial corneal pathogens as well as multiple solid and liquid media culture methods.

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Discussion: The data presented in this study add further evidence to the findings regarding the increasing incidence of fungal keratitis in the Indian subcontinent. The high prevalence of Fusarium species is concerning and highlights the need for improved antifungal therapies and better diagnostic tools to improve the management of fungal keratitis.