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Epidemiology, diagnosis, evolution of 45 mucormycosis cases during the 2006-2016 period in a single tertiary hospital

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Background: Mucormycosis is a rare, dreadful infection, with an increasing incidence, occurring mainly in immunocompromised patients, or patients with diabetes or trauma/burn lesions. With 9 hematological/oncologic departments and a burn unit, our hospital has also faced an increase of mucormycosis diagnoses, that's why an epidemiological study from 01/ 2006 to 06/2016 was conducted. The purpose of our study was to analyze the evolution of predisposing factors, to give a descriptive epidemiology of mucormycosis cases and to study mortality and its risk factors.

Material/methods: A Retrospective analysis of risk factors, clinical, radiological features, microbial diagnosis and outcome of all patients with a mucormycosis diagnosis in one French hospital over 10 years was conducted. All cases were validated by a multidisciplinary committee.

Results: During the study period, 45 mucormycosis cases were diagnosed (10 before 2011, and 35 after), 11 among severely burn patients, 27 among haematological patients (14 Acute Leukemia, 5 lymphoma, 4 myelodysplastic syndrom, 3 medullary aplasia, 1 other) with 14 allograft patients, 2 patients with solid cancers, 1 kidney transplant patient, 4 with diabetes alone. Main site of infection was pulmonary (19 cases, 22%), sinus (16 cases, 36%), cutaneous (14 cases, 31%), liver (3 cases, 7%), other (12 cases, 26%), disseminated (4 cases, 9%). Direct exam showing ribbon-like hyphae was positive in 35/42 (83%) cases, culture positive for mucormycosis in 23/40 (58%), quantitative polymerase chain reaction (qPCR) DNA mucorales in serum in 16/18 cases (89%) and in 9/13 biopsies (69%). Another concomittant infection was observed in 16 (36%) of cases. Prior exposure to antifungals was noted for 27 (60%) patients. Surgical treatment was undertaken in 26 (58%) cases, 40 (89%) received liposomal amphotericin B, 22 (49%) posaconazole, 7 caspofungin (16%), 1 isavuconazole (2%), and 7 (16%) had a tapering of immunosuppressive treatment. Overall mortality was 71% with 47% mortality related to mucormycosis. Three months mortality was 50%, without any death observed in the "diabetes alone" and "kidney transplant" groups. Looking at mortality risk factors, having received voriconazole (HR: 2.4 (1.2-4.6) p: 0.008) or fluconazole (HR: 2.5 (1.0-6.2), p: 0.02) as previous antifungal therapy were significant and not the other antifungals. As curative treatment, having received liposomal amphotericin B (HR: 0.4 (0.1-0.97), p: 0.04) or posaconazole (HR: 0.3 (0.2-0.68), p: 0.002) was protective of death but the adjunction of surgery (p:0.2) or caspofungin (p:0.9) were non-significant.

Conclusions: Our study gives an overview of the recent advances and remaining challenges in the management of mucormycosis infection. In the past 2 years, molecular tools enabled us to make faster diagnosis and we hope to see a mortality decrease in a near future. Severely burned patients are now routinely screened for mucormycosis by qPCR. Mortality remains high in the haematological and burn population.