Antifungal therapy in the intensive care unit (ICU) – potential pitfalls

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Background and Objective: Antifungal therapy in the ICU, particularly therapy targeting resistant aspergillosis, mucormycosis and systemic candida, is often of lifesaving importance. Posaconazole and voriconazole are the antifungal agents of choice. Our aim was to compile a tool that can be used at the ICU to address aspergillosis, mucormycosis and systemic candida in an optimal manner.

Design: Female patient, age 50+, liver transplant, CRP > 300mg/L, creatinine > 150µmol/L. Abdominal X-ray imaging revealed four large abscesses and laboratory analyses confirmed mucormycosis. Posaconazole intravenous (300mg 1 times daily) and liposomal amphotericin B (1mg/kg/day) were initiated. The inflammatory markers remained unchanged 5 days following initiation of therapy with no change in size or number of abscesses and the patient developed sepsis. Amphotericin B dose was increased to 3mg/kg/day. After 1 week the inflammatory parameters and size of abscesses began to fall. The dosage form of posaconazole was switched from intravenous to mixture. The dose remained the same and within 24 hours the CRP rose to 600mg/L.

Results: Pharmacist intervention revealed a missing loading dose of intravenous posaconazole as well as incorrect dosage of the per oral form due to bioavailability variation. Posaconazole mixture dose was increased to 400mg 2 times daily. Through serum concentration analysis of posaconazole was suggested prior to the dose increase. The serum concentration was 0.6mg/L (range > 1.0 to 1.25). Through serum concentration 4 days later was 1.2mg/L. Both CRP and abscess size were on the decline. A dosage and TDM pocket card for posaconazole therapy of mucormycosis, aspergillosis and candida was compiled.

Conclusion: Optimal systemic fungal infection therapy is essential, especially in the critically ill. Of special importance is TDM and correct dose adjustment when dosage-form changes occur.