Editorial

Candida burn wound sepsis: The “holy trinity” of management

Over the past few decades, survival following severe burn injury has been substantially improved with fatal outcome nearly exclusively observed among the elderly, patient with extreme (>85%) total burnt surface area or patients suffering from inhalation injury necessitating mechanical ventilation (Ryan et al., 1998; Brusselaers et al., 2005; Belgian Outcome in Burn Injury Study Group, 2009). The more severely burned cases are especially at risk of additional complications, adding substantial morbidity.

Nosocomial infection frequently complicates the course of a patient with burn injuries. These patients are at high-risk for infectious complications for multiple reasons. The burned skin loses its function as natural barrier against microbial species; the inflammatory storm provoked by the injury may take days or even weeks, resulting in a down-regulated immune system; the critical illness requires prolonged use of invasive devices such as intravascular and urinary catheters and endotracheal tubes allowing mechanical ventilation. Most frequently observed infections in burned patients include ventilator-associated pneumonia (especially in case of associated inhalation injury), bloodstream infection and catheter-associated urinary tract infection (Brusselaers et al., 2010a, 2012; Patel et al., 2012; Norbury et al., 2016).

Conversely, burn wound sepsis has become relatively rare due to innovations in surgery and optimization of topical wound care (Demling, 2008; Brusselaers et al., 2010b; Zuo et al., 2017). Burned patients are often cared for in protective isolation to prevent them from being colonised or infected with hospital-associated bacteria such as Pseudomonas aeruginosa or methicillin-resistant Staphylococcus aureus, two important pathogens often associated with outbreaks in burn units (Douglas et al., 2001; Blot et al., 2003; Safdar et al., 2006; Pednekar et al., 2010; Baier et al., 2017; Raes et al., 2017). Furthermore, Candida infections, which are assumed to originate from critically ill patients’ own gut mucosa or skin (Blot and Vandewoude, 2004), may pose an additional infectious complication. Therefore, protective isolation of burn victims is not likely to favourably alter the risk of such infections.

In this issue of *Intensive & Critical Care Nursing*, Fan et al. describe a rare case series of severely burned patients whose course was complicated by Candida tropicalis burn wound sepsis (Fan et al., 2018). The observation of a series of five cases urges clinicians to appreciate the risk for this infection. Albeit that it is an opportunistic pathogen, and for that reason may favour severely burned patients, Candida isolation from wounds generally represents colonisation rather than deep tissue invasion. Even a small increase in the rate of wound sepsis should alert clinicians to consider potential sources of this problem.

weeks). Invasive candidiasis generally occurs in critically ill patients after a prolonged course that resulted in a strongly debilitated physical condition, a typical feature of opportunistic pathogens. Second, the Candida sepsis was caused by the same species. Little is known about specific risk factors for C. tropicalis, with the exception that non-albicans Candida species are more often isolated from patients who were previously exposed to fluconazole (Blot et al., 2001, 2006). Yet, none of the patients received antifungal prophylaxis before onset of the Candida sepsis. Third, all patients underwent surgical interventions before onset of Candida sepsis. Taking together these three observations (same Candida species, early in the course and post-surgery) might raise a suspicion of a common source of infection. This might be a contaminated piece of surgical equipment or a package of contaminated dressings (Bryce et al., 1996; Dancer et al., 2012). It should be noted that the investigators did not support their study with DNA fingerprinting to assess the clonality of C. tropicalis as the aetiopathological pathogen for the sepsis series. In terms of route-cause analysis this would have been highly interesting. What argues against a common source of infection is the relative wide time-frame in which the cases are observed (2012–2014). This might also be the reason why in-depth microbiological investigation was not performed.

A final remark on the series is that all patients, as per protocol, received antimicrobial prophylaxis with meropenem. Due to their broad antimicrobial spectrum, carbapenems are preferred for empiric antibiotic therapy in patients with an overt risk profile for multidrug resistance involvement or for definitive therapy in the absence of an alternative (Vogelaers et al., 2010). The use of this potent antimicrobial agent for prophylaxis is worrisome. First, it does not match the international call for prudent use of antimicrobials and secondly, antimicrobial prophylaxis is not recommended following burn injuries. Perhaps the specific situation of the unit urged the authors to systematically use meropenem, but no information on local microbial ecology was provided. Last but not least, excessive use of broad-spectrum antibiotic therapy is a significant and well-recognised risk factor for invasive candidiasis.

What is most important to keep in mind as the key message is the “holy trinity” of fungal infection treatment and management, which consists of (1) timely recognition of the potential fungal infection, (2) early and appropriate administration of antifungal treatment according to guidelines and local susceptibility patterns and, (3) aggressive and extensive debridement of the infected tissue (Spebar and Lindberg, 1979; Spebar et al., 1982; Pruitt et al., 1979; Pruitt et al., 1982; Specia et al., 1979; Gambari et al., 1983; Pratt et al., 1983; Pratt et al., 1984).
There are some interesting features in this case series that...
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