Clinical Epidemiology of Candida Colonization and Infection in Military Trauma

Background: Combat-related injured patients have high rates of mold wound infections (MWI) with mortality rates of 7.8%. This is the first study to examine the risk factors, epidemiology, and outcomes of Candida infections and colonization in US military personnel in Iraq and Afghanistan.

Methods: Between 6/30/03-12/31/06, from a population of 5,694 patients from the Trauma Infectious Disease Outcomes Study (TIDOS), all initial unique and serial (7 days between same species) Candida isolates were included. Clinical information associated with Candida isolates was evaluated.

Results: 127 (2%) patients with 131 unique Candida isolates were included. 99% of patients were male with a median age of 23 and an infection severity score (ISS) of 22. 90 (71%) injuries were due to explosive device blasts, 22 (17%) to gunshot wounds (GSW), and 80% of patients were hospitalized in Afghanistan. There was a median of 7 days (max=1, 127) from injury to initial Candida isolate. 102 (79%) of unique isolates were C. albicans; 10 (8%) were C. glabrata, and 7 (6%) C. parapsilosis. Isolation of non-albicans Candida spp. was more common with prior traumatic amputations (10, 9%), intestinal abscesses (9, 6%), and wound isolates (5) in multivariate analysis (p<0.01). 74 (56%) isolates were associated with infection and colonization compared to the overall TIDOS population. There was no attributable mortality to C. albicans infection. 30% also had mild and 21% multilayer-resistant bacterial infections which were not significantly associated with death. Conclusions: Military trauma patients have high rates of Candida infection and colonization with no attributable mortality, its presence is associated with a similar mortality rate to invasive MWI.

Abstract

Study population: The Trauma Infectious Disease Outcomes Study (TIDOS) was implemented on June 1, 2009. TIDOS eligibility criteria include active duty personnel or Department of Defense beneficiaries ≥18 years who are injured during deployment requiring evacuation to Landstuhl Regional Medical Center (LRMC) in Germany and ultimately transferring to a participating clinical site in the US. All patients with isolation of Candida spp. from initiation of TIDOS to October 26, 2015 were included in the analysis.

Results: Trauma history, clinical characteristics on admission, course, and outcomes were obtained and analyzed retrospectively from the TIDOS database.

Statistical Analysis: Uni-variable analysis by χ² and Fisher’s Exact Test for categorical variables. Multivariate analysis for significant risk factors (p<0.05) from univariate analysis with logistic regression

Study Findings: In multifactorial analysis, we sought to identify clinical characteristics and outcomes associated with Candida spp. colonization and infection in deployment-related injured personnel in Iraq and Afghanistan.

Overall Demographics and Injury Patterns: Colonization. While this is not associated with attributable mortality, its presence is associated with a similar mortality rate to invasive MWI.

• Natural disasters and mammade bombings have been associated with both multidrug-resistant (MDR) bacterial infections and invasive mold wound infections (MWI).
• Among trauma patients with penetrating injuries related to natural disasters, rates of wound infections were highest in patients with Candida as high as 20%.
• The risk factors and role of Candida spp. colonization and infection in these patients is unclear.
• We sought to identify clinical characteristics and outcomes associated with Candida spp. colonization and infection in deployment-related injured personnel in Iraq and Afghanistan.

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Acknowledgments

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