Extended-spectrum Beta-Lactamase (ESBL) bacteremia: Looking into the risk factors of mortality from Malaysian's perspective

Muhammad Hazwan Nasarudin[1], Najma Kori[1], Ramliza Ramli[2], Rozita Hod[3], Chee Lan Lau[4], Petrick Periyasamy[1]

[1]Department of Internal Medicine, Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia, [2]Department of Medical Microbiology & Immunology, Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia, [3]Department of Public Health, Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia, [4]Department of Pharmacy, Hospital Canselor Tuanku Muhriz, Kuala Lumpur, Malaysia

ABSTRACT

Introduction: Expanded-spectrum beta-lactamase (ESBL) bloodstream infection often leads to severe outcomes like mortality and treatment failure. We aimed to identify these risk factors in patients with ESBL bacteremia. **Materials and methods:** We performed a retrospective cohort analysis of those aged 13 years old and above admitted to Hospital Canselor Tuanku Muhriz (HCTM), for ESBL bacteremia, between January 2015 and August 2019. Patients with polymicrobial bacteremia were excluded. **Results and conclusion:** The all-cause in-hospital mortality rate was 30.2%, while the infection-related mortality rate was 22.5%. The all-cause in-hospital mortality risk factors include hypertension (OR 3.18; CI 1.21 – 8.40; *p*=0.02), diabetes mellitus (OR 2.65; CI 1.16 – 6.08; *p*=0.02), skin and soft tissue infections (SSTIs) (OR 5.27; CI 1.25 – 22.31; *p*=0.02) and mechanical ventilation (OR 3.53; CI 1.27 – 9.82; *p*=0.02). The independent risk factor associated with mortality was mechanical ventilation (AOR 3.12; CI 1.06 – 9.18; *p*=0.04). No association found between appropriate empirical antibiotic treatment and mortality (*p*=0.74). However, appropriate definitive treatment was associated with a lower mortality rate ($p < 0.01$). The risk factors for mortality in our study were different from previous studies, mainly due to the fact that we had lower critically-ill patients, lower ICU admission rate, and higher Diabetes Mellitus and Hypertension prevalence, compared to other South-East Asian countries. Despite that, our study echoed the previous paper with a comparable mortality rate and was in line with the IDSA guideline in treating ESBL bacteremia, which is by using carbapenem antibiotics. However, more study is needed to look into the risk factors for mortality in more critically-ill patients, for the empirical antibiotic.