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P0650 Carbapenem-resistant Enterobacteriaceae infections - the importance of source control

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Background: CRE is a global health threat associated with high morbidity and mortality. We described the clinical characteristics, microbiology, treatment and outcomes of CRE infections and identified risk factors for mortality.

Materials/methods: A retrospective cohort study of adult inpatients with CRE infections (excluding urine infections) was performed at a large, tertiary hospital in 2013–2016. The primary outcome was 30-day all-cause in-hospital mortality. Predictors of mortality were evaluated in patients who received definitive treatment (treatment after availability of susceptibility results) using multivariable regression.

Results: 123 cases [*Klebsiella pneumoniae* (53%), *Enterobacter* spp. (16%), *Escherichia coli* (15%)] were identified. Intra-abdominal (26%) and bloodstream infections (28%) were the most common, followed by skin/soft tissue infections (22%) and pneumonia (15%). CRE was highly-resistant to all tested antibiotic classes but retained susceptibilities to tigecycline (89%), polymyxin B (86%), and amikacin (76%). Most isolates were carbapenemase-producers (All – 91%, KPC – 55%, NDM – 28%, OXA-48-like – 18%). Empiric antibiotics and source control were initiated in 115(93%) and 45(37%) patients respectively. Clinical response was observed in 73(59%) patients and microbiological clearance was observed in 41/45(91%) of cases with bloodstream involvement. Among patients who received definitive treatment (99/115, 86%), the mortality rate was 25%. At least one *in vitro* active agent was prescribed in 79/99(79%) cases. Combination therapy was administered in 70/99(71%) patients who received definitive treatment. These patients commonly received carbapenem-containing combinations (47/99, 47%), of which 31/47(67%) is in combination with polymyxins. In the univariate analysis, older age, age-adjusted Charlson's comorbidity score (ACCI), pneumonia and intra-abdominal infections, carbapenemase production, and severe illness were associated with mortality. The mortality rate was higher in carbapenemase-producing CRE infections compared to non-producers [50% vs. 0%]. After multivariable adjustment, only ACCI [OR 1.20 (95%CI 1.00 – 1.45)] and source control [OR 0.30 (95%CI 0.09 – 0.98)] were associated with mortality. Receipt of combination therapy was not associated with mortality [OR 0.59 (95% CI 0.19 – 1.80)].

Conclusions: ACCI was directly associated with mortality, while source control was associated with lower risk of death. Poor outcomes of CRE infections are likely contributed by deep-seated infections such as intra-abdominal infections where source control has not been achieved.