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# O0534 First systematic review on risk factors for carbapenem-resistant Gram-negative infections

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**Background:** Antibiotic resistance remains a global concern, putting the treatment of several infectious diseases at risk. Addressing carbapenem resistance (CR) in Gram-negative pathogens has emerged as a priority. Early identification of patients at risk of CR can facilitate early diagnosis and appropriate antibiotic therapy. We conducted the first systematic review to identify risk factors associated with CR Gram-negative infections.

**Materials/methods:** A systematic literature review for studies reporting risk factors for CR Gram-negative infections in hospitalised patients was performed, including urinary tract infections, hospital acquired pneumonia, ventilator-associated pneumonia, community acquired pneumonia, bloodstream infections, intra-abdominal infections, central nervous system infections and skin and skin structure infections. Studies were eligible if they compared risk factors of patients with CR infections with those of patients with carbapenem susceptible infections. Studies published since 2007 and in English language were eligible for inclusion.

**Results:** 9,197 unique records were assessed and 71 were eligible for inclusion. The studies assessed risk factors for six different gram negative pathogens. Study characteristics were considered and the risk factors reported were categorised per pathogen.

Univariate analysis showed intensive care unit (ICU) stay to be a risk factor for CR infection, for five pathogens (K. pneumoniae, E. coli, P aeruginosa, A. baumannii, and A. nosocomialis) (odds ratios (ORs)) range from 1.67 (95% CI 1.26 – 2.21) to 22.57 (7.16 – 71.1). Previous carbapenem exposure was found to be a risk factor for all six pathogens (ORs range from 2.89 (1.36 – 61.5) to 37.13 (4.09 – 336.96)). Additional risk factors reported for four or more pathogens were mechanical ventilation, central venous catheter and urinary catheter use. When data from multivariate analyses were assessed, ICU stay, prior exposure to carbapenems and mechanical ventilation were most frequently confirmed to be independent risk factors for CR infection. Risk factors specific to any single pathogen were not detected.

**Conclusions:** This is the first comprehensive systematic review on risk factors for CR Gram-negative pathogen infection. Results confirmed that certain nosocomial related risk factors (i.e. ICU stay, ventilation and urinary/venous catheterization) were associated with CR across pathogens and sites of infection. Previous carbapenem exposure seems the strongest predictor across pathogens.