Antimicrobials: epidemiology of MDR Gram-negatives

Multidrug-resistant and extensively drug-resistant *Klebsiella pneumoniae* bloodstream infections in intensive care unit patients: epidemiology and outcomes


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Objectives: *Klebsiella pneumoniae* (KP) represents one of the most dreadful nosocomial pathogens due to the widespread emergence of multidrug-resistant (MDR) clones. We sought to investigate epidemiologic trends and outcomes of bloodstream infections (BSIs) by KP, in ICU patients in a geographic area with high prevalence of antimicrobial resistance.

Methods: In a prospective registry of 12 Greek ICUs first episodes of BSI were recorded, excluding those with isolation of coagulase-negative staphylococci as single pathogen, during the first half of 2012 and 2013. Patients’ demographics, comorbidities, microbiological data, treatment and outcomes were recorded in an electronic database. Non-parametric analysis was performed with SPSS13 according to the variable distribution patterns; p values <0.05 were considered as significant.

Results: A total of 79 patients (61.5% male) with BSIs by KP were analyzed. Median (interquartile range) age was 64 years (45-75), APACHE II, SOFA and SAPSII scores were 21 (16-26), 9 (7-11) and 50 (39-59) respectively; prior to the BSI use of antibiotics was 18 days (8-27).

The reason of ICU admission was medical (44.3%), surgical (36.7%, 87.1% of them emergent), or trauma (6.3%). BSIs were classified as primary (63.5%), catheter related/CRBSI (15.9%) and secondary (20.6%, most frequent source respiratory). Crude and attributable ICU mortality were 42.5 and 20.3% respectively. The majority of isolates (84.9%) were MDR with 73.8% exhibiting carbapenem resistance; colistin, tigecycline and gentamicin resistance was detected in 7.7, 29.5 and 38.4% respectively. ICU-acquired BSIs (80.4%) were less likely associated (p 0.038) with a piperacillin/tazobactam-susceptible KP strain compared to the nosocomial+healthcare- acquired counterparts (16.1%); no significant difference was recorded in any other variable or outcome. In 49.4% of cases KP was a copathogen, more frequently along with another Gram-negative (25.3%), mostly Enterobacteriaceae (n=9) or *Acinetobacter baumannii* (n=6) or *Pseudomonas aeruginosa* (n=6); a Gram-positive was recovered in12.7% (mostly coagulase-negative staphylococci) and *Candida* spp in 6.3%. Non-survival was associated with the number of comorbidities (p 0.007), the recovery of a copathogen in blood culture (p 0.027) and the type of the copathogen (p 0.010). Among the three severity scores used, only higher SAPSII was significantly associated with 28day ICU crude mortality in this cohort (p 0.025).

Conclusion: In a cohort of Greek ICU patients KP BSIs showed an extensively drug-resistant profile along with a considerable mortality and were quite often parts of polymicrobial primary BSIs. The recovery of a second or a third copathogen affected adversely mortality.