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Abstract (oral session)

Observational study of bloodstream infections caused by carbapenemase-producing Klebsiella pneumoniae

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Objectives: Carbapenemase-producing Klebsiella pneumoniae (CPKP) have spread widely causing serious infections in healthcare settings. The aim of the present study was to evaluate the importance of carbapenemase production on outcome of patients with K. pneumoniae bloodstream infections (BSIs). Methods: A prospective observational study was conducted at two tertiary care hospitals located in Athens between September 2009 and November 2010. Consecutive patients with K. pneumoniae BSIs were identified and followed up until discharge or death. Susceptibilities to antibiotics were determined by the Etest. All isolates were examined for the presence of carbapenemases by combined disk test based on meropenem-EDTA and meropenem-boronates synergy. The carbapenemase encoding genes were detected by PCR using specific primers for blaVIM and blaKPC. Results: A total of 347 patients were included in the analysis; 214 (62.8%) were infected with CPKP (134 with KPC, 44 with VIM, 36 with both KPC and VIM) and 133 were infected with non-CPKP. During the study period, the incidence of KPC BSIs increased from 0.16 to 0.31/1000 patient-days whereas the incidence of VIM BSIs remained low and stable (0.07/1000 patient-days). The all-cause 14-day mortality rates were 17.3% (23 of 133) for patients infected with carbapenemase-negative organisms, 20.5% (9 of 44) for those infected with VIM-positive organisms, and 29.4% (50 of 170) for those infected with KPC or KPC and VIM-positive organisms (P=0.042). In multivariate analysis, Charlson’s score (odds ratio [OR]=1.24; p=0.001), septic shock (OR=3.97; p<0.000), polymicrobial bacteremia (OR=2.84; P=0.03), and carbapenemase production (OR=1.99; p=0.003) were independent predictors of death. After adjustment for appropriate therapy, the effect of carbapenemase production on outcome was reduced to a level of non-significance, whereas administration of appropriate treatment was associated with favorable outcome (OR=3.2; p=0.006). Conclusion: In patients with K. pneumoniae BSIs, carbapenemase production, severity of sepsis, underlying diseases, and polymicrobial bacteremia were independent predictors of adverse outcome. The higher mortality associated with carbapenemase production was mediated by the failure to provide effective therapy.