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O0285 Total reversal of carbapenemase-producing *Klebsiella pneumoniae* epidemiology from *bla*KPC to *bla*VIM in an ICU after introduction of ceftazidime-avibactam

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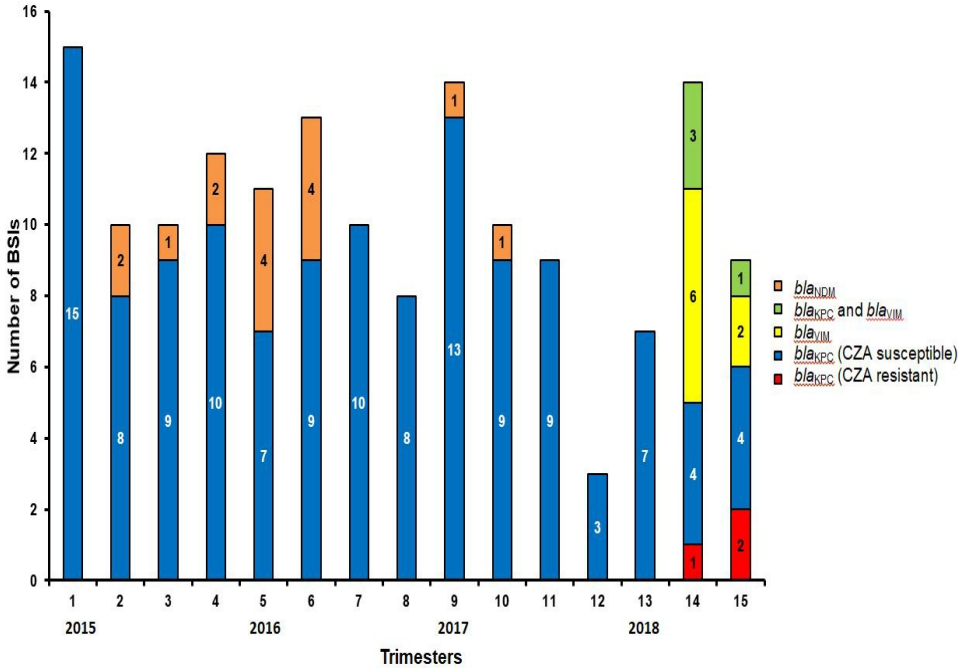
Background: Ceftazidime-avibactam (CZA) is a new beta-lactam/beta-lactamase inhibitor active against *Klebsiella pneumoniae* strains carrying bla_{KPC}. The objective was to determine the epidemiology of bloodstream infections (BSIs) by carbapenemase-producing *K. pneumoniae* (CP-Kp) after the introduction of CZA in January 2018 among Intensive Care Unit (ICU) patients.

Materials/methods: During a 45-month period (January 2015 to September 2018), all CP-Kp BSIs among patients hospitalized at ICU of the University General Hospital of Patras, Greece were included. Antimicrobial susceptibility was performed by the agar disk diffusion method. Colistin, tigecycline and CZA susceptibility was evaluated by Etest. Results were interpreted according to EUCAST guidelines. The presence of bla_{KPC}, bla_{VIM}, bla_{NDM}, bla_{OXA-48} genes was confirmed by PCR.

Results: Among 156 BSIs by CP-Kp, 128 (82%) were caused by isolates carrying bla_{KPC} (3 CZA-resistant), 16 bla_{NDM} (10%), 8 bla_{VIM} (5%) and 4 carrying both bla_{KPC} and bla_{VIM} (3%) (Figure). From 2015 to 2017 (125 BSIs), KPC-producing strains (110; 88%) predominated followed by NDM-producing (15; 12%), while no VIM-producing strain was isolated. Among the 30 BSIs in 2018 (January to September), 18 (60%) were due to isolates carrying bla_{KPC} (3 CZA-resistant), followed by 8 (27%) carrying bla_{VIM} and 4 (13%) carrying both bla_{KPC} and bla_{VIM}. Metallo-beta-lactamases were more frequent in 2018 as compared to 2015-17 (40% vs 25%: $P<0.001$). Overall colistin and tigecycline resistance was 46% and 23%, respectively. The overall consumption of CZA was 23.3 DDD per 1,000 patient-days. Prior administration of CZA was a risk factor in the univariate analysis for the development of BSI due to a strain resistant to CZA (60.0% vs 7%, P 0.005). Multivariate analysis found that prior administration of CZA was independently associated with the development of such infections (*P* 0.009: OR 21.0, 95% CI 2.2-204.6).

Conclusions: After introduction of CZA in January 2018, a reversal of carbapenemase epidemiology was observed with arise of strains carrying bla_{VIM}. Resistance to CZA among KPC-producing strains was still low (17%). Administration of CZA was the sole independent risk factor for the development of BSI due to strains intrinsic (metallo-beta-lactamase-producing isolates) or acquired resistance to CZA.



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