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Carbapenem antimicrobial stewardship programme

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Background: The prevalence of carbapenem resistance throughout the world is increasing and carbapenems are considered critically important antimicrobials by the WHO. The aim of study is to evaluate clinical and antibiotic resistance impact of carbapenems Antibiotic Stewardship Programs (ASP).

Materials/methods: Descriptive study between January-2012/December-2018, pre-post-intervention. A carbapenems ASP was initiated in January 2015, in patients who started treatment with carbapenems (meropenem/ertapenem). An infectious diseases physician performed treatment recommendations to prescribers. Prospective information was collected to evaluate adequacy of carbapenems prescription to local guidelines and to compare results between cases with accepted or rejected intervention. Cases with carbapenems prescription during the last 4 months of 2014 were retrospectively reviewed, this sample of the pre-intervention period was used to compare with patients who started treatment with carbapenems during the intervention period. Appropriate treatment with carbapenems was considered when it was prescribed in patients with: 1. Severe sepsis; 2. history of ESBLs colonization; or 3. hospital-acquired infection in which a broad-spectrum antibiotic treatment was considered necessary. Analysis was performed to verify variables associated with any significant change in clinical evolution, carbapenems consumption, hospital-acquired multidrug-resistant (MDR) bloodstream infections (BSIs) and 30-day all-cause crude death in MDR-BSIs.

Results: Adequacy of carbapenems prescription improved progressively over time, after ASP implementation (p <0.001). Interventions on prescription were performed in 416 (34.5%) patients without carbapenems justified treatment (meropenem 389/ertapenem 27), in 339 (81.5%) intervention was accepted and in 77 was not. Intervention acceptance was associated with shorter duration of treatment (11.3±10.2 vs 13.4±8.6) and inpatient days (18.4±16.8 vs 27.3±23.6, p=0.002), without differences in clinical evolution. During the 2015-2018 period meropenem consumption in DDD/100 patients-day decreased compared with 2012-2014 [Rate ratio 0.61; 95%CI: 0.58-0.64, p<0.001), and ertapenem consumption increased somewhat (Rate ratio 1.07; 95%CI: 0.94-1.22). Hospital-acquired MDR-BSIs rate and 30-day all-cause crude death in MDR-BSIs deceased (0.66; 95%CI: 0.44-1.00, p=006) and (RR 0.60; 95%CI: 0.28-1.34, p=0.29), respectively, coinciding in time with ASP start-up.

Conclusions: The decrease and better use of carbapenems achieved was associated with shorter duration of treatment and of inpatient days, without differences in clinical evolution, and with a decrease of hospital-acquired multidrug-resistant bloodstream infections rate.

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