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Paper Poster Session

Emergence and worldwide outbreaks of carbapenemase-producing bacteria

Epidemiology of carbapenemase-producing Enterobacteriaceae in a tertiary hospital in Spain: trends and impact of infection control measures

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Background: Carbapenemase-producing enterobacteriaceae (CPE) cause serious infections in debilitated and immunocompromised patients, in association with prolonged hospital stays and increased mortality rate. Therapeutic options are limited and treatment should be timely and aggressive to be efficacious. Enhanced infection control measures are needed to limit the spread of this CPE in a tertiary hospital. Standard precautions reinforcement for all patients and transmission based precautions (contact isolation) for colonized and infected patients are a key factor to reduce its impact.

Material/methods: The aim of this study is to describe the epidemiological and microbiological characteristics of carbapenemase-producing *Enterobacteriaceae* during a year in a tertiary hospital in Madrid (Spain). Active surveillance cultures were made weekly in each hospitalization unit when two cases of colonized or infected patients were detected the previous week. Rooms cleaning and disinfection were made twice a day with a sodium hypochlorite solution (2500 ppm). Communication of each case to public health authorities was mandatory. Training sessions in infection control measures to healthcare professionals involved were made in all units.

Results: A total of 356 new cases of CPE were detected from the first of November 2014 to 31 of October 2015. The average of age was 75,1 years (SD 14,74), and 55,9% were men. The density of incidence of this period has been 1,49 ‰ days of stay. 72,47% were nosocomial cases, 6,46% community cases and 21,06% healthcare associated cases. We detected one of three Ambler classes of carbapenemase, A (KPC-type) in 10 cases (2,81%), B (metallo-beta-lactamase) in 71 cases (19,94%) and D (OXA-48-type) in 197 cases (55,34%). Most of the patients (299) presented rectal colonization (83,9%), 45 (12,6%) had an infection, and 12 (3,4%) of them presented both. In the 57

infection cases the most frequent locations were urinary tract infection (59,6%, 34 cases), bacteremia (15,8%,9 cases), respiratory (10,5%, 6 patients), wound infections (12,3%, 7 patients) and renal abscess (1,75%, 1 patient). Microorganisms isolated most frequently were *Klebsiella pneumoniae* in 210 patients (59,98%), and 190 of them (90,5%) were also ESBL producers. *Escherichia coli* was isolated in 52 patients (14,6%), 11 of them (21,15%) were ESBL producers. *Pseudomonas aeruginosa* was detected in 29 patients (8,14%). 26 patients had more than one CPE. Internal Medicine was the department most frequently involved with 34,6% of the cases. The average length of stay was 25,4 days (SD 22,8) and the mortality rate was 11,2%. We had an average of 21 isolated patients daily with CPE.

Conclusions: This data suggest a rising trend of CPE detection in our hospital. Although most of the cases are colonizations, a good compliance with infection control measures is needed to contain this spread. Enhance antimicrobial stewardship policies is another main measure to limit the antibiotic pressure selection.