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Background: Carbapenemase-producing Enterobacteriaceae are increasingly reported worldwide. The aim of the study was to determine the incidence and molecular epidemiology of carbapenemase-producing Enterobacteriaceae (CPE) in a Tunisian hospital between 2009 and 2017.

Materials/methods: The study included all Enterobacteriace strains isolated from clinical samples in Habib Bourguiba University hospital, Sfax Tunisia, from 2009 to 2017. All strains non-susceptible to carbapenems were tested for carbapenemase production by phenotypic methods and PCR. The incidence of CPE isolates was calculated per 1000 patient-days.

Results: Between 2009 and 2017, carbapenemases were detected in 664 Enterobacteriaceae strains (4.48%) increasing from 19 in 2009 to 118 in 2017. 447 strains produced OXA-48-like carbapenemases (67%), 197 NDM (30%), 18 OXA-48+NDM (3%) and 2 VIM. OXA-48-like carbapenemases were predominant in 2009 (100%) and NDM in 2017 (60%).

Klebsiella pneumoniae was the most frequent (n= 524, 81.3%) species followed by Enterobacter spp. (n= 36, 5.6%), Escherichia coli (n= 32, 4.9%), Providencia stuartii (n= 27, 4.2%) and Proteus mirabilis (n= 4, 0.6%). The incidence of carbapenemase increased significantly in K. pneumoniae from 4.48% in 2009 to 26.34% in 2017. The CPE were isolated mainly from urine (37%), pus (21%), blood (20%) and respiratory samples (16%). Co-resistance rates were less than 20% only for colistin ant tigecyclin.

The overall incidence rate of CPE isolates in the hospital increased from 0.139 in 2009 to 0.814 per 1000 patient-days in 2016 especially in the ICUs.

Conclusions: Our study confirms the rapid spread of CPE in a Tunisian hospital and the urgent need for a well-structured and coordinated national surveillance plan in order to limit their dissemination.