P1277 Distribution of carbapenemase-producing Enterobacteriaceae in Europe, ATLAS Global Surveillance Program 2016-2017

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Background: Carbapenemase-producing Enterobacteriaceae (CPE) pose a serious global health threat. The majority of CPE are resistant to all β-lactams. In Europe, an increase in the overall number of CPE and a worsening epidemiological situation in some countries has been reported. In this study, we examined the incidence of CPE collected in Europe as part of the ATLAS global surveillance program from 2016-2017.

Materials/methods: Non-duplicate, clinically significant isolates of Enterobacteriaceae were collected by 74 medical laboratories in 18 countries. Investigators collected a predefined number of selected bacterial species regardless of antibiotic susceptibility. Susceptibility testing was performed by CLSI broth microdilution. All Enterobacteriaceae with meropenem MIC > 1 mg/L and all Escherichia coli, Klebsiella spp. and Proteus mirabilis with aztreonam or ceftazidime MIC > 1 mg/L were screened for genes encoding acquired carbapenemases by PCR and sequencing.

Results: A total of 658 CPE (4.3% of collected isolates) were identified in Europe. The overall percentage of CPE was higher in the Central/Eastern subregion (n=340, 6.0%) than in the Northern/Western subregion (n=318, 3.3%) and correlated well with meropenem non-susceptibility (Figure). Two- to fourfold higher percentages of OXA-48-like-positive, NDM-positive, and VIM-positive isolates were observed in Central/Eastern Europe, while the percentage of KPC-positive isolates was comparable in both subregions. Within Central/Eastern Europe, the countries with the highest percentages of CPE were Greece (13.7%; predominantly KPC- and VIM-positive), Turkey (12.2%, OXA-48-like, NDM), Russia (7.4%; OXA-48-like, NDM), and Romania (6.8%; OXA-48-like, NDM). In Northern/Western Europe, the highest proportions of CPE were found in Italy (13.3%; KPC, OXA-48-like, VIM), Spain (4.6%, OXA-48-like) and Belgium (2.9%, OXA-48-like). GES-positive CPE were only found in France and Spain (<1%). No CPE were identified among isolates collected in Sweden or the Czech Republic and no IMP-positive CPE were found in any surveyed country.
Conclusions: There were substantial differences in the distribution and incidence of carbapenemase types within Europe. Though the ATLAS surveillance program is not structured to measure the prevalence of resistance mechanisms, the general distribution of carbapenemase types and countries in which the highest percentages of CPE were observed were consistent with published reports.

Northern/Western Europe: Belgium, Denmark, France, Germany, Italy, Netherlands, Portugal, Spain, Sweden, United Kingdom. Central/Eastern Europe: Austria, Czech Republic, Greece, Hungary, Poland, Romania, Russia, Turkey.
MEM-NS, meropenem non-susceptible (MIC > 2 mg/L) by EUCAST 2018 guidelines.