28th ECCMID EUROPEAN CONGRESS OF CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES
Madrid, Spain
21 – 24 April 2018

P1075 Report of the National Reference Laboratory for Multidrug-Resistant Gram-negative Bacteria on carbapenemases in Germany in 2017

Niels Pfennigwerth*[1], Agnes Anders[1], Miriam Korte-Berwanger[1], Felix Alexander Lange[1], Jennifer Schauer[1], Sören G. Gatermann[1]

[1]Ruhr-University Bochum, Department of Medical Microbiology, Bochum, Germany

Background: Multidrug-resistance in *Enterobacteriacea, Pseudomonas aeruginosa* and *Acinetobacter baumannii* is of utmost therapeutic importance since hardly any innovative antimicrobial drug against gramnegative bacteria will be introduced into clinical practice within the next years. Among all resistance mechanisms the worldwide spread of carbapenemases is the most worrisome development. However, the correct identification of carbapenemases is still challenging for the microbiological laboratory.

Materials/methods: The National Reference Laboratory for Multidrug-Resistant Gramnegative Bacteria offers the free service of carbapenemase detection in bacterial isolates with elevated carbapenem MICs. All isolates are tested by a wide array of phenotypic and molecular methods. A bioassay based on cell-free extracts and WGS methods allow the detection of still unknown β-lactamases.

Results: A total of 5517 isolates were investigated for carbapenemases in the National Reference Laboratory in 2017 until November 14th. Specimen sources were mostly rectal swabs (23.3 %), urinary (15.7 %) and respiratory samples (12.5 %). Carbapenemases were found in 1469 *Enterobacteriaceae* strains (47,3 %), 382 *P. aeruginosa* (27.9 %) and 407 *A. baumannii* (97.3 %). The most frequent carbapenemases in *Enterobacteriaceae* were OXA-48 (n = 525), VIM-1 (n = 269), KPC-2 (n = 155), NDM-1 (n = 219), KPC-3 (n = 64), OXA-181 (n = 61), NDM-5 (n = 58), OXA-232 (n = 47) and OXA-244 (n = 24). In *P. aeruginosa,* VIM-2 was the most frequent carbapenemase (n = 256), followed by VIM-1 (n = 24), IMP-7 (n = 18) and GIM-1 (n = 17). OXA-23 was the most frequent carbapenemase in *A. baumannii* (n = 305), followed by OXA-72 (n = 52) and NDM-1 (n = 12).

Conclusions: A variety of different carbapenemases has established in Germany. However, the molecular epidemiology in Germany with a predominance of OXA-48 differs significantly from observations made in other countries like Greece, Italy or the USA. Compared to previous years, variants of OXA-48 are again on the rise, together with variants of NDM and VIM.