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P1282 Report of the national reference laboratory for multidrug-resistant Gram-negative bacteria on carbapenemases in Germany in 2018

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Background: Multidrug-resistance in *Enterobacterales*, *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 5238 isolates were investigated for carbapenemases in 2018 until October 11th. Carbapenemases were found in 1455 *Enterobacterales* strains, 407 of *A. baumannii* and 372 of *P. aeruginosa*. The most frequent carbapenemases in *Enterobacterales* were OXA-48 (n = 447), VIM-1 (n = 262), NDM-1 (n = 156), KPC-2 (n = 142), NDM-5 (n = 99), KPC-3 (n = 60), OXA-244 (n = 57), OXA-181 (n = 55), OXA-232 (n = 34), NDM-7 (n = 13) and VIM-4 (n = 12). GIM-1, OXA-162, VIM-2, IMI-1, IMI-2, GES-5, and and others were found in less 10 isolates each. In *P. aeruginosa,* VIM-2 was the most frequent carbapenemase (n = 252), followed by GIM-1 (n = 29), VIM-1 (n = 18), IMP-7 (n = 18) and NDM-1 (n = 14). VIM-4, GES-5, VIM-11, IMP-13, VIM-17, IMP-1, IMP-28 and others were found in less than 10 isolates each. OXA-23 was the most frequent carbapenemase in *A. baumannii* (n = 3013), followed by OXA-72 (n = 60) and NDM-1 (n = 16). GIM-1, OXA-143, OXA-58 and others were found in less than 10 isolates each.

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