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Abstract (poster session)

Report of the national reference laboratory for multidrug-resistant Gram-negative bacteria on carbapenemases in Germany in 2012

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Background: Multidrug-resistance in Enterobacteriacea, Pseudomonas aeruginosa and Acinetobacter baumannii is of utmost therapeutic importance since no innovative antimicrobial drugs against gramnegative bacteria will be introduced into clinical practice within the next five years. Among all resistance mechanisms the worldwide spread of carbapenemases is the most worrisome development. However, the correct identification of carbapenemases is challenging for the microbiological laboratory. 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 allows the detection of still unknown beta-lactamases. Results: A total of 1601 isolates were investigated for carbapenemases in the National Reference Laboratory in 2012. Carbapenemases were found in 364 Enterobacteriaceae strains (40.6%), 97 P. aeruginosa (22.0%) and 263 A. baumannii (93.9%). The most frequent carbapenemase in Enterobacteriaceae was OXA-48 (36.8%), KPC-2 (24.5%), VIM-1 (17.6%), KPC-3 (11.5%) and NDM-1 (5.5%). NDM-1 was found only in four Enterobacteriaceae strains. In P. aeruginosa VIM-2 was the most frequent carbapenemase (69.1%). OXA-23 was the most frequent carbapenemase in A. baumannii (80.6%). NDM-1 was produced in three strains. Conclusion: Almost all carbapenemases found worldwide also arrived in Germany. However, the molecular epidemiology in Germany with a predominance of OXA-48 differs significantly from observations made in other countries like Greece, Israel, USA or the United Kingdom. An ongoing surveillance of resistance determinants is necessary, especially for infection control and diagnostics.