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P0922 The evolution of carbapenem resistance determinants and major epidemiological lineages among carbapenem-resistant *Acinetobacter baumannnii* isolates in Germany, 2010-2016

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Background: *Acinetobacter baumannii* is a major pathogen causing healthcare-associated infections, especially in the intensive care unit (ICU). Penicillins and cephalosporins are usually not clinically effective, while carbapenems play an important role in the management of *A. baumannii* infections. However, *A. baumannii* possesses intrinsic class D β-lactamase genes (*bla*OXA-51-like) being able to confer carbapenem resistance. The majority of carbapenem-resistant isolates however possess acquired carbapenemase-encoding genes including $bla_{\text{OXA-23-like}}$, $bla_{\text{OXA-40-like}}$ and $bla_{\text{OXA-58-like}}$. The objectives of the present study were i) to evaluate the occurrence of carbapenem resistance determinants among *A. baumannii* isolates collected during three multicentre surveillance studies conducted by the Paul-Ehrlich-Society between 2010 and 2016, and ii) to investigate the molecular epidemiology of these isolates.

Materials/methods: Isolates were collected prospectively from hospital in-patients at 18 medical centres in Germany, in each case over a three-month-period in the years 2010, 2013 and 2016. Verification of species identification and susceptibility testing were performed in a reference laboratory. MICs were determined by broth microdilution according to the ISO-standard and interpreted by EUCAST breakpoints (v.8.1). The prevalence of carbapenemase-encoding genes was investigated by oxacillinase (OXA)-multiplex polymerase chain reaction (PCR) and whole-genome sequencing. The molecular epidemiology was examined by repetitive sequence-based PCR (rep-PCR; DiversiLab) and core-genome MLST (cgMLST).

Results: Overall, 236 *A. baumannii* isolates were collected.There were 61 ICU isolates and 175 non-ICU isolates. Resistance to imipenem and/or meropenem was detected in 49 isolates from 13 centres, of which 41 (83.7%) produced an OXA-23-like carbapenemase. Other carbapenemases detected were OXA-24-like (n=3), OXA-58-like (n=2) and NDM-1 (n=2). The proportion of resistant isolates evolved from 15/74 (20.3%) in 2010 to 21/65 (32.3%) in 2013 and then decreased to 13/97 (13.4%) in 2016 (chi-squared-test for linear trend, p=0.2). One carbapenem-resistant isolate was cross-resistant to colistin. Thirty-seven carbapenem-resistant isolates (75.5%) were associated with the clonal lineage IC 2 (13/15 [86.7%] in 2010, 17/21 [81%] in 2013, 5/13 [38.5%] in 2016) and six with IC 1.

Conclusions: This nationwide study found a pooled rate of non-susceptibility to carbapenems of 20.8% (95%-CI: 15.6-26%) in the period 2010-2016, with a decrease in the rate of IC 2 isolates harbouring the *bla*OXA-23-like gene.