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Abstract (poster session)

A large-scale outbreak caused by OXA-48-producing Enterobacteriaceae in a neonatal intensive care unit (NICU): epidemiological and microbiological characteristics

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Objectives: Our aims were 1) to describe the course of an OXA-48 producing Enterobacteriaceae (OPE) outbreak in a NICU, 2) to describe the results of the intervention and 3) to characterize the molecular features of the OPE strains. Methods: The course of the outbreak and the intervention were recorded by the Ministry of Health team. Determination of resistance mechanisms was done by PCR and sequencing of the bla genes and typing was performed by PFGE and MLST. The blaOXA-48-harboring plasmids were compared to the global blaOXA-48-harboring vector. Results: The first 2 cases of bacteremia caused by carbapenem-resistant strains were noted in March 2012. By July 2012, the incidence had increased up to 9 cases/week. The Ministry of Health was notified and intervened in July. The intervention program included closing the unit to new admissions, cohorting colonized patients, frequent rectal surveillance of exposed newborns and improving the implementation of infection control practices. No new cases were identified following 4 weeks of the intervention. Three children hospitalized in the Pediatric ICU were identified as carriers of OPE, which presumably was introduced to this unit by an infant previously in the NICU. Two patients with a previous stay in the affected NICU were identified as OPE carriers upon admission to another hospital. In total, we identified 49 patients who had proven or suspected acquisition of OPE in the NICU, including 16 with invasive infections, out of a total of 156 patients hospitalized in the NICU during that period. 25 patient-unique isolates were available for molecular analysis, 23 K. pneumoniae and 2 Enterobacter cloacae. All isolates produced OXA-48 and CTX-M-14; the K. pneumoniae isolates belonged to a single clone, ST39, that also produced CTX-M-15. blaOXA-48 was located inside a Tn1999.2 transposon, and was carried on the same plasmid with blaCTX-M-14. This plasmid was ~60 kb in size and tested positive for repA, parA and traU, similar to the global blaOXA-48-harboring vector. Conclusion: Dissemination of OPE by combined clonal spread and horizontal plasmid transfer led to a large-scale NICU outbreak. An intervention that included temporary ward closure, active surveillance and cohorting of colonized patients was rapidly effective. A plasmid similar to the global blaOXA-48-harboring vector has now acquired blaCTX-M-14, leading to resistance to all beta -lactam agents.