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Paper Poster Session
Emergence and worldwide outbreaks of carbapenemase-producing bacteria

Ongoing outbreak due to Klebsiella pneumoniae OXA-48 in an Italian referral hospital

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Background: The 2014 ECDC Surveillance data have confirmed a high-level endemicity of carbapenem-resistant *Klebsiella pneumoniae* in Italy. KPC is by far the most widespread mechanism of resistance, accounting for >90% of the strains. Here we describe an ongoing outbreak, caused by an OXA-48-producing *Klebsiella pneumoniae* strain, in an Italian hospital located in area of very low CRE endemicity. Thus far, production od OXA-48 is a mechanism that has been rarely reported in Italy.

Material/methods: The bacterial identification was performed by Vitek-2 (bioMérieux). Minimal inhibitory concentrations (MICs) were determined by Vitek-2 and/or by a micro-dilution method (Sensititre Diagnostic System, Trek), and interpreted according to the EUCAST criteria. The mechanism of carbapenem resistance was confirmed by a Real Time PCR method which allows the detection of the bla_{OXA-48}, bla_{VIM}, bla_{IMP-1}, bla_{NDM} and bla_{KPC} carbapenemase genes. Genotyping to determine genetic relatedness between isolates was performed by an analysis of pulsed-field gel electrophoresis (PFGE) profiles of chromosomal DNA digested with XbaI.

Results: At the beginning of September 2015 a patient underwent cholecystectomy and after 20 days he needed a drainage at the surgical site, from which an MDR *Kleblsiella pneumoniae* strain was isolated, subsequently identified as OXA-48 producer. The strain was resistant to penicillins +/- beta-lactamase inhibitors, cephalosporins, carbapenems, levofloxacin, was intermediate to tigecycline, and was susceptible to colistin, amikacin and trimethoprim/sulfamethoxazole. The resistance profile suggested the presence of an ESBL mechanism associated to OXA-48. In the following two weeks the same strain had been detected in another 4 patients, three in the surgery department, and one in a medical ward. Two of them were intestinal colonisations, while the other two had clinical infections (peritoneal and drainage fluids).

PFGE typing of the isolates identified a single profile.

All five cases were characterized as hospital-acquired, and none of them were linked to a history of travel in endemic areas for OXA-48 producing *Klebsiella pneumoniae*. After a temporary containment, three new cases were detected in late November 2015, one from a blood culture, one from a cutaneous swab and one from a rectal swab, all admitted to the medical department, whose characterization is ongoing.

Conclusions: Trieste hospital is located in a Region of low-level endemicity of carbapenem-resistant *Klebsiella pneumoniae*, and before September 2015 the only mechanism of resistance to carbapenems detected in *Klebsiella pneumoniae* had been KPC production. In this report we describe the first outbreak of OXA-48 *Klebsiella pneumoniae* in Italy. Further studies will investigate the possible source of the outbreak.