

## Recent epidemiological data on carbapenem-resistant Enterobacteriaceae

Multi-centre survey of carbapenemase-producing *Escherichia coli* and *Klebsiella pneumoniae* in German hospitals

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## Objectives

Aim of this study was to determine the prevalence of carbapenemase-producing *Escherichia coli* and *Klebsiella pneumoniae* in clinical specimens of hospitalized patients and to further characterize the isolates.

## Methods

As part of a European surveillance project (EuSCAPE), 20 laboratories throughout Germany collected *E. coli* and *K. pneumoniae* strains non-susceptible to ertapenem, imipenem or meropenem between November 2013 and April 2014 from clinical specimens. The isolates were tested for carbapenemase production by modified Hodge test, combined disk test with boronic acid and EDTA, disk diffusion for temocillin and PCR followed by sequencing for *bla*<sub>KPC</sub>, *bla*<sub>IMP</sub>, *bla*<sub>NDM</sub> and *bla*<sub>OXA-48</sub>. In addition MLST was performed.

## Results

Of 46 isolates non-susceptible to carbapenems, four *E. coli*- and 20 *K. pneumoniae*-isolates producing a carbapenemase were found in ten centers. Carbapenemase producers of both species were detected in two patients. In total, the rate of carbapenemase-producing *E. coli* and *K. pneumoniae* per 1000 admissions was 0.052 (95%CI: 0.033 to 0.077). OXA-48 was found in 14 isolates from twelve patients treated at nine centers. *K. pneumoniae* isolates positive for OXA-48 belonged to sequence types ST15, ST45, ST101, ST307, ST377 and ST392. KPC-2 was detected in seven isolates from four centers, NDM-1 was found in two isolates from two centers. A single *E. coli* isolate harbouring NDM-5 was detected.

## Conclusions

The prevalence of carbapenemase-producing *E. coli* and *K. pneumoniae* in clinical specimens among hospitalized patients in Germany is still low. However, various carbapenemase producers could be detected in half of the participating centers. OXA-48 was the most frequently detected carbapenemase and had the widest geographical spread in German hospitals. The multiclonal background of OXA-48 producing *K. pneumoniae* highlights the importance of horizontal gene transfer for this carbapenemase.

