27th ECCMID Vienna, Austria 22 – 25 April 2017
The congress of ESCMID

Session: P031 The mcr genes around the world

Category: 3b. Resistance surveillance & epidemiology: Gram-negatives

23 April 2017, 12:30 - 13:30
P0693

First report of the plasmid-mediated colistin resistance gene mcr-1 in a clinical Escherichia coli isolate in the Sultanate of Oman

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Background: *mcr-1* gene has not been found earlier in the Sultanate of Oman. The aim of the present study was to search for plasmid mediated colistin resistance in *Enterobacteriaceae* isolated recently in Muscat, Oman.

Material/methods: Twenty-two colistin resistant *Enterobacteriaceae* clinical isolate collected between July 2014 and June 2016 in a tertiary care hospital were screened by PCR for the *mcr-1* and *mcr-2* genes. The strain identified as *mcr-1* positive was genotyped, and its antibiotic susceptibility was established. The *mcr-1* containing plasmid was mobilized into *Escherichia coli* K-12 and its sequence was determined.

Results: In the 22 clinical isolates screened a single *Escherichia coli* isolate (OM97) carrying *mcr-1* gene was identified. *mcr-2* positive isolate was not found. *E. coli* OM97 was isolated in June 2016 from blood of a male patient with multiple co-morbidities, who underwent bypass surgery for aortic aneurysm. *E. coli* OM97 belonged to ST10. It was susceptible to third generation cephalosporins, carbapenems and gentamicin, and beyond colistin, was resistant to amoxicillin-clavulanic acid, amikacin, tobramycin, ciprofloxacin, tetracycline and co-trimoxazole. In *E. coli* OM97 the *mcr-1* gene

was located on a conjugative IncI2 type plasmid of 63722 bp size. The plasmid did not harbor any further resistance genes and the genetic surrounding of the *mcr-1* gene lacked the IS*Apl1* element.

Conclusions: Although colistin resistance caused by the *mcr-1* gene is not common in our collection of clinical isolates, the occurrence of the plasmid mediated colistin resistance in an *E. coli* ST10 strain is of concern as this clonal group was already shown to spread ESBL-genes and quinolone resistance in human isolates worldwide. It is especially worrisome, that as the *mcr-1* gene occurred in a non-ESBL, carbapenem susceptible *E. coli* strain, current admission screening protocols would not detect its presence.