Colistin resistance among carbapenem-resistant Enterobacteriaceae recovered in Belgium in 2014-2015

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Introduction

• mcr-1 plasmid-mediated resistance to colistin was reported for the first time in 2016 (Liu et al., 2016) raising the concern of its occurrence in multidrug and in extensively-resistant Enterobacteriaceae.
• Here, the frequency of colistin resistance was assessed among carbapenem-resistant Klebsiella pneumoniae (KP) and Escherichia coli (EC) isolates referred to the national reference centre in 2014 and in 2015.
• The mechanism of resistance to colistin was explored to determine the chromosomal or plasmidic origin of the resistance.

Results

**Introduction**

Colistin resistance in KP and EC carbapenem non-susceptible: n=791 including 101 (12.7%) isolates colistin R (KP-CR; MIC from 4 to >= 16 mg/L)

Seventy-four KP-CR analyzed: no plasmidic mcr-1

Klebsiella pneumoniae colistin R (n=74)

**Methods**

• Inclusion criteria: all clinical KP and EC non-susceptible to carbapenems (EUCAST or CSL criteria) detected locally by Belgian laboratories from Jan. 2014 to Dec. 2015 and sent for confirmation to the NRC (CHU UCL Namur, Yvoir, Belgium).
• MIC determination against colistin and carbapenems (meropenem, ertapenem, imipenem) was performed by broth microdilution (Sensititre panels, Thermofisher) and susceptibility categorized using EUCAST criteria.
• Carbapenemase encoding genes (Bogaerts et al. 2013), mcr-1 plasmidic gene (Liu et al., 2016) and the mcr-1 gene were confirmed by LAMP technology using Amplex Diagnostics GMBH detection kit.
• mcr-1 plasmid was transferred by electroporation in E. coli Top10

**Seventy-four KP-CR analyzed: no plasmidic mcr-1**

Klebsiella pneumoniae colistin R (n=74)

**kp-CR mcr-1 related resistance**

Colistin resistance in KP and EC carbapenem non-susceptible: n=152 including 2 (1.3%) isolates colistin R (EC-CR; MIC=4 mg/L)

Two EC-CR producing MCR-1 and OXA-48

E. coli (EC) carbapenem non-susceptible: n=152 including 2 (1.3%) isolates colistin R (EC-CR; MIC=4 mg/L)

**Conclusions**

• Colistin resistance was found in 13% of carbapenem non-susceptible KP and in 1% of carbapenem non-susceptible EC received in 2014 and 2015.
• Colistin resistance in KP was not related to mcr-1 but to various modifications of mcr-8 or other chromosomal mutations under investigation (pmrAB/PhoP/PhoQ).
• Colistin resistance was found in 2 unrelated E. coli isolates expressing OXA-48.
• Plasmids were sequenced (Ceyssens et al. Poster P0700)

**References**