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Abstract (poster session)

Carbapenemase producers in the Czech Republic – current situation

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Objectives: Monitoring of the epidemiological situation in carbapenemase-producing Gram- negative bacteria is necessary to prevent the rapid spread of this type of carbapenem resistance. The objective of this work is to summarize the current incidence and spectrum of carbapenemase producers in the Czech Republic. Methods: All blood isolates of *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* have been sent to the National Reference Laboratory for Antibiotics since 2005 for the purpose of EARS-Net survey. Moreover, Enterobacteriaceae and *Acinetobacter baumannii* isolates resistant to meropenem or imipenem according to the CLSI or EUCAST criteria were sent to the NRL for Antibiotics and/or to the Pilsen laboratory for confirmation of resistance to carbapenems. The approximation disk test was used to detect MBLs, KPCs and AmpC enzymes. Carbapenemase activity was formerly confirmed by imipenem spectrophotometric hydrolysis assay and recently by MALDI-TOF MS hydrolysis assay. Identification of carbapenemase was performed by PCR followed by amplicon sequencing. MLST was performed in *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Acinetobacter baumannii* isolates. Results: The most of the analysed isolates were resistant to the carbapenems due to the porin mechanism. Carbapenemase production has been confirmed in minority of the cases. The KPC-2 carbapenemase was firstly detected in *K. pneumoniae* (ST258) isolated from a patient repatriated from Greece, followed by KPC-3-producing *K. pneumoniae* (ST515) from a patient previously hospitalized in Italy. VIM-1 metallo-beta-lactamase was detected in two strains of *Serratia marcescens* isolated independently in two hospitals and also in *K. pneumoniae* isolates. VIM-1-producing *K. pneumoniae* has been responsible for local outbreaks in one hospital in Prague. In spring 2011, the first NDM-1 producer was observed in the Czech Republic. NDM-1 was detected in *Acinetobacter baumannii* (ST1) isolated from a patient repatriated from Hurgada, Egypt. Metallo-beta-lactamase-producing *P. aeruginosa* isolates (VIM-2, IMP-7) have been detected in at least 7 hospitals causing local outbreaks. Conclusions: Although the incidence has been mostly sporadic in the Czech Republic, the outbreak potential of these isolates has already been shown. In 2011, rapid increase of carbapenemase-producing enterobacteria was observed. This work has been supported by the research project grant NT11032-6/2010.