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ePoster Session

Controlling MDR Gram-negative bacteria

Containment of an outbreak of KPC-producing *Klebsiella pneumoniae* in a geriatric ward

A. Anesi[1], S. Asticcioli[1], D. Baroni[1], A. Piazza[2], M. Ferrari[3]

[1]*Laboratory of Microbiology- Ospedale Maggiore, Lodi, Italy*

[2]*Department of Clinical-Surgical- Diagnostic and Paediatric Sciences, Unit of Microbiology, University of Pavia, Pavia, Italy*

[3]*Department of Hygiene- Ospedale Maggiore, Lodi, Italy*

Objectives. To evaluate the effect of a bundle of infection control measures on the horizontal transmission of *Klebsiella pneumoniae* carbapenemase (KPC)-producing *K. pneumoniae* during an outbreak in a geriatric ward.

Methods. A bundled intervention was implemented in a ward of the Ospedale Maggiore, Lodi, Italy to contain an outbreak of KPC *Klebsiella pneumoniae* occurred from August to October 2013**.** Infection control measures were implemented following the detection of the index carbapenem-resistant *K. pneumoniae* isolate, but the outbreak continued to evolve with more isolates being detected. Infection control measures were therefore reinforced, including: spatial isolation of colonized or infected patients; education of patients and their families, physicians and staff members about carbapenemases-producing bacteria; monitoring compliance with hand hygiene and use of barrier precautions; enhancement of environmental cleaning and decontamination with active chloride plus an automated decontamination systems using a broad spectrum, bioactive disinfectant agent based on mist-generated hydrogen peroxide and silver cations (HyperDRYMist, 99 Technologies); surveillance rectal cultures from all admitted patients and from all patients in the ward. Swabs were plated onto chromogenic CRE-selective media (ChromID CARBA SMART agar, Biomerieux) and incubated at 35°C for 18-24 h. Carbapenem resistance of the isolated bacterial strains was initially detected by routine methods according to EUCAST guidelines and production a carbapenemases was identified by Rosco KPC/MBL Confirm Kit. The genetic relatedness of all KPC–producing *K. pneumoniae* isolates was evaluated using pulsed-field gel electrophoresis (PFGE) analysis.

Results. KPC-producing *K. pneumoniae* patients were recovered from clinical and screening specimens of 14 patients, aged 59–93 years, that had been hospitalized in the ward for a median of 12 days (range: 4-33 days) before CRKP identification. Seven were treated for KPC *Klebsiella pneumoniae* infection and seven were found to be asymptomatically colonized. Six patients had urinary tract infections, one had a respiratory tract infection. All strains collected were susceptible only to colistin and gentamicin. Intermediate susceptibility to tigecycline occurred in 8 isolates. PFGE analysis of the *K. pneumoniae* isolates identified one clonal type. The clonal type A included subtypes A1 and A2, differing by not more of 3 bands from A. The outbreak was ultimately controlled within a 3-month period of time, with no novel carbapenem-resistant isolates being detected thereafter.

Conclusion. The application of strict infection control measures combined with automated technologies in decontamination allows the containment of an outbreak and reinforces the importance of rapid identification and notification of multidrug-resistant Gram-negative bacteria to reduce transmission.