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Paper Poster Session
Surveillance and control of nosocomial pathogens and infection

Colonization by multidrug-resistant bacteria in long-term care facilities in Italy: a point-prevalence study

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Background: Multidrug-resistant (MDR) bacteria constitute a major public health concern worldwide. Residents in long-term care facilities (LTCFs) are at increased risk for colonization/infection with MDR organisms because of age-associated morbidities, exposure to recurrent antibiotic courses and frequent referral to and from acute-care hospitals. This study aimed to determine the prevalence of colonization by extended-spectrum β-lactamase (ESBL)- and/or carbapenemase-producing Enterobacteriaceae, hypervirulent antibiotic resistant *Clostridium difficile* and methicillin-resistant *Staphylococcus aureus* (MRSA) in elderly LTCF residents in Italy.

Material/methods: A point-prevalence study was conducted at 12 LTCFs located in 4 different Italian regions (1 February 2015–15 March 2015). The total number of residential beds was 856. Only LTCF residents aged ≥ 65 years who were not admitted in sub-intensive care units and/or special care wards were enrolled in the study. Socio-demographic and clinical data of the residents were collected. After obtaining informed consent, clinical samples were collected and cultured: faecal samples for *C. difficile*, faecal samples/rectal swabs for ESBL- or carbapenemase-producing Enterobacteriaceae and nasal/axillary swabs for MRSA. Antibiotic susceptibility testing, detection of toxigenic *C. difficile*, identification of carbapenemase-encoding genes, MLST genotyping, screening for *Escherichia coli* ST131 and capillary gel electrophoresis PCR-ribotyping were appropriately carried out on *E. coli*, *Klebsiella pneumoniae* and *C. difficile* isolates. Potential risk factors for colonization were investigated.

Results: Overall, a total of 489 LTCFs residents (mean and median age: 85 and 86 years, respectively; 69.1% female) were enrolled. The mean and median length of LTCF stay was 41.4 and 18.0 months (Q1=4.0; Q3=51.0). Of all enrolled residents, 21.3% had been hospitalised within the previous 3 months and 26.4% had received antibiotics in the last month. A total of 418 isolates (303 ESBL-producing Enterobacteriaceae, 93 MRSA, 21 *C. difficile*) were collected. The overall prevalence of colonization by ESBL-producing Enterobacteriaceae, *C. difficile* and MRSA was 57.3% (279/487), 5.1% (21/409) and 17.5% (85/487 for at least one sample site), respectively. Carriage rate of carbapenemase-producing Enterobacteriaceae was low (1%, 5/487). Most ESBL-producing Enterobacteriaceae isolates were *E. coli* (247/303, 87.3%) followed by *K. pneumoniae* (35/303, 12.7%). The MDR *H30*-ST131 subclone strongly predominated among *E. coli* isolates (70.0%). Among carbapenemase-producing Enterobacteriaceae, 3 *K. pneumoniae* isolates harboured bla_{KPC-3} and 2 *E. coli* isolates carried bla_{VIM-1}. Significant differences in *C. difficile* colonization rates were observed among the different LTCFs, with no residents colonized in 5 LTCFs. Notably, prior hospitalisation resulted to be associated with *C. difficile* colonization (OR 4.87; 95% CL 1.91-12.42; p 0.0013). All but one *C. difficile* isolates were toxigenic. The predominant PCR-ribotype was 356/607 (50%). Most *C. difficile* isolates (85%) were MDR; of these 82% were resistant to erythromycin, clindamycin, rifampicin and moxifloxacin.

Conclusions: MDR bacteria, especially ESBL-producing Enterobacteriaceae, represent a huge problem in Italian LTCFs. Specific control actions are needed.