

Session: P024 Infection control: update and limitations

**Category: 8d. Nosocomial infection surveillance & epidemiology**

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### The microbiome and the enteropathogenetic syndrome: risk for recurrent infections

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**Background:** Gastrointestinal dysbiosis is important in the pathogenesis of *C. difficile* infection (CDI) as in many cases of bloodstream infection (BSI) caused by *Candida*, ESBL-producing Enterobacteriaceae and KPC-producing *K. pneumoniae* (KPC-Kp), sometimes referred as enteropathogenetic syndromes. Few data reported subsequent episodes of infections in such diseases.

**Material/methods:** This was a single centre observational study on patients admitted to Molinette Hospital, Turin, from January 2013 to April 2015 with CDI or BSI caused by *Candida*, ESBL-producing Enterobacteriaceae or KPC-Kp. For each patient demographic, clinical and microbiological data were collected. Aims of the study were to describe the epidemiology and to evaluate risk factors for second infections in these patients.

**Results:** 786 cases were analyzed: 398 CDI, 137 Candida BSI, 126 ESBL-producing Enterobacteriaceae BSI and 125 KPC-Kp BSI. The annual incidence of CDI in medical wards was 0.9%, while the one of KPC-Kp BSI in ICU was 5.7%. In-hospital death occurred in 23.4%.

Among 786 cases evaluated for the first episode of infection, 138 (17.5%) patients had a second infection due to enteric pathogens during hospitalization: 51 (37%) had a previous BSI (19 by *E. coli*, 18 by Enterococci), 30 (21.7%) a subsequent BSI (11 Klebsiella, 12 Enterococci). Candidemia followed BSI in 3% of patients. CDI preceded BSI, mostly candidemia in 31% of patients, whilst 4% of patients had CDI after KPC-Kp BSI.

The median age was 69 ( $\pm 15$ ), 61.6% were male; 71% had a previous hospitalization in the 6 months before admission and 46.4% had previous surgery. In the 6 months before the admission, the antibiotic consumption was documented in 48.6%, while 87% had antibiotics during the recovery, before the diagnosis. The majority of patients had cardiovascular or neurologic disease (50% and 30.4%, respectively) and they had a central venous line at the time of admission (78%) or had recently treated with total parenteral nutrition (57; 41%). In-hospital death occurs in 69.6%, while mortality at 14 days was 18.1%.

Moreover, patients with subsequent infections were usually more frequently admitted to medical wards ( $p=0.004$ ), had parenteral nutrition ( $p<0.001$ ), had a central venous line at time of admission ( $p<0.001$ ) and a higher use of colistin therapy ( $p<0.001$ ): in hospital mortality was higher in this group of patients ( $p=0.02$ ).

**Conclusions:** The gastrointestinal alterations are well recognized key players in promoting intestinal colonization, overgrowth and diseases by opportunistic microorganisms. Patients with one enteropathogenetic infection are more suitable to a second infection and this may reflect the alteration of intestinal microbiota and the intestinal barrier damage which may help translocation from the lumen to blood. To reduce the opportunity of enteropathogenetic infectious syndromes, there is a strong need of a correct antibiotic use and adequate infection control measures.