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Paper Poster Session III

Clostridium difficile on the move

Diagnosis and epidemiology of *Clostridium difficile* infection (CDI) in Italy: results of a national study conducted in 2012-2013

P. Spigaglia¹, F. Barbanti¹, M. Morandi², M.L. Moro², P. Mastrantonio¹

¹Istituto Superiore di Sanità, Rome, Italy

²Agenzia Sanitaria e Sociale - Regione Emilia Romagna, Bologna, Italy

Objectives. A national study on *Clostridium difficile* infection (CDI) was carried out in Italy between 2012 and 2013 to obtain information on CDI diagnosis and to characterize the *C. difficile* strains isolated during the study.

Methods. Microbiologists of the Italian National Public Health System were invited to provide information on diagnostic protocols for CDI by the Istituto Superiore di Sanità (ISS) through a closed answer questionnaire between October and December 2012. *C. difficile* strains were voluntarily sent from different Italian hospitals to ISS between July and November 2013. Strains were typed by agarose gel-based PCR-ribotyping method and/or capillary gel electrophoresis-based method and denominated using the nomenclature of the Leeds-Cardiff collection and/or the WEBRIBO nomenclature. All strains were also characterized using Xpert® *C. difficile* (Cepheid). Antibiotic susceptibility to moxifloxacin (MXF), erythromycin (ERY), clindamycin (CLI), rifampin (RIF), metronidazole (MTZ) and vancomycin (VAN) were evaluated by agar dilution method.

Results. In total, 278 filled questionnaires were sent back to ISS and 15 Italian regions participated in the study. The data obtained indicate that 87% of the laboratories perform diagnostic assays for *C. difficile*. GDH detection is used as the first screening test by 33% of these laboratories. Most of them declared to use toxins enzyme immunoassays (88%), whereas a minority performs *C. difficile* culture (26%) or molecular assays (18%). Only 38% of the laboratories stated to adopt a diagnostic algorithm. Fifty eight percent of laboratories declared to type *C. difficile* strains, the majority (82%) sending fecal samples or strains to a reference laboratory. In total, 103 isolates from 22 hospitals were collected and 31 different PCR-ribotypes were identified. PCR-ribotype 356/607 was the most frequent (27%), followed by 018 (12%) and 027 (8%). Four PCR-ribotypes (027, 033, 078 e 126) were positive for toxin A, B and the binary toxin CDT. In particular, PCR-ribotype 033 produces only CDT and it has been recently associated with symptomatic cases. 71% of the strains analysed were resistant at least to one of the antibiotic tested, and 59% were multi-drug resistant (MDR). Interestingly, all strains PCR-ribotypes 356/607 and 018 were resistant to ERY, CLI, MXF and RIF, as the 75% of strains 027. No strains were resistant to MTZ or VAN.

Conclusion. The results showed the emergence of new PCR-ribotypes in Italy, including 356/607 and the hypervirulent 027. The majority of these strains were MDR and cause of severe infections and outbreaks. The information provided by microbiological laboratories indicates an increased awareness about CDI in our Country (87% perform diagnostic assays) even if a more careful selection of algorithms to improve CDI diagnosis and the implementation of a National Surveillance of CDI in Italy are needed.