Different distribution of Clostridium difficile PCR-ribotypes in acute care and long-term care wards of Czech hospitals

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**Background:** Clostridium difficile infection (CDI) is the most important bacterial cause of hospital-acquired diarrhoea. The aim of the study is to compare the presence and distribution of various *C. difficile* PCR-ribotypes in acute care and long-term care wards of ten Czech hospitals in 2015.

**Material/methods:** During 2015, 10 different Czech hospitals, providing acute and long-term care, were requested to participate in a national study of *Clostridium difficile* infections (CDI). *C. difficile* strains cultured from stool samples of hospitalized patients with CDI were sent for molecular typing to the central laboratory in Motol University Hospital, Prague. PCR-ribotyping was performed according to the protocol recommended by the European *Clostridium difficile* infection surveillance network (ECDIS-net) using the Webribo database to determine the relevant ribotype (https://webribo.ages.at/). Antibiotic susceptibility to metronidazole and vancomycin was determined by E-test.

**Results:** A total of 223 strains (151 from acute care, 72 from long-term care wards) were available for further characterisation. The average age of patients in acute care was 72.4 (median 76) years and 80.3 (median 83) years in long-term care wards. Of all the isolates (n=223), 38.1% belonged to the PCR-ribotype 001 (n=85) and 28.7% belonged to PCR-ribotype 176 (n=64). Other frequently found toxigenic PCR-ribotypes were: 014 (7.2%), 020 (3.5%), 012 (3.5%) and 002 (2.7%). Differences in the distribution of various PCR-ribotypes in acute care and long-term care wards were observed (see graph). Thirty-four different PCR ribotypes were identified in isolates from acute care wards and only ten different ribotypes were identified in isolates from long-term care wards. A significant difference was found for PCR-ribotype 176, which was present in 22% of isolates from acute wards, compared with 43% of isolates in long-term care. All isolates were susceptible to metronidazole and vancomycin with minimum inhibitory concentrations ranging from 0.03–2.0 mg/L for metronidazole and 0.015–1.0 mg/L for vancomycin.

**Conclusions:** Our results show a significantly high prevalence of epidemic PCR-ribotypes 001 and 176 (027-like) in ten hospitals in the Czech Republic. A higher diversity of ribotypes was observed among isolates from patients in acute-care wards. In contrast, a **twofold higher** frequency of PCR-
ribotype 176 was detected in long-term care wards, suggesting more efficient transmission and disease development in the higher age group of patients.

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Distribution of epidemic C. difficile ribotypes 001 and 176 in acute-care wards and long-term care wards of ten Czech hospitals in 2015.