Summary

Introduction: *Clostridioides difficile* infection (CDI) is the most common nosocomial gastrointestinal infection, it is associated with antibiotic use and due to the spread of epidemic strains of *C. difficile*, there are differences in the course and severity of the disease. This study aimed to describe the characteristics of patients with CDI, to perform molecular analysis of isolates , and then to correlate CDI course and treatment outcomes with the causative ribotypes. Furthermore, the efficacy of antibiotic regimens in the treatment of CDI was evaluated with the severity and number of CDI episodes.

Methods: The observational cohort study was conducted in 2013-2016 at the Department of Infectious Diseases of the Bulovka University Hospital in Prague. Patients with laboratory-confirmed CDI were included in the study. *C. difficile* isolates were characterized by ribotyping, multiple variable tandem repeat analysis (MLVA) and examination of antibiotic resistance determinants (mutations in *gyrA*, *gyrB*, *rpoB* genes or the presence of ermB). Univariate logistic regression was used to evaluate the efficacy of antibiotic regimens (metronidazole, vancomycin, combination of vancomycin and metronidazole, fidaxomicin). Subgroup analyses were performed based on the number and severity of CDI episodes.

Results: A total of 111 C. difficile isolates were characterized, of which 64 (58%) belonged to PCR-ribotype 176. MLVA analysis of PCR-ribotype 176 isolates revealed 11 clonal complexes. Severe CDI according to ESCMID criteria was observed in 42 patients (37.8%) and 16 patients (14.4%) had an ATLAS score ≥ 6. 26.1% of patients had recurrent CDI and 21.6% died. In the overall study group, fidaxomicin was more effective than metronidazole, vancomycin or their combination in terms of sustained clinical response and prevention of recurrent CDI (rCDI). In subgroup analyses, fidaxomicin was superior in terms of sustained clinical response and prevention of rCDI for initial episode, first recurrence, and non-severe cases. In the treatment of severe CDI, fidaxomicin had comparable treatment outcomes to vancomycin, and none of the antibiotics was superior in preventing rCDI.

Conclusion: Ribotype 176 was the most common causative agent of CDI, causing a more severe disease course, more frequent relapses and higher mortality. We point out the risk of its nosocomial spread. Fidaxomicin was more effective than metronidazole or vancomycin in treating patients with the initial episode, first relapse and non-severe CDI.