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Asymptomatic Clostridium difficile colonization on admission to a hospital: a multi-centre study

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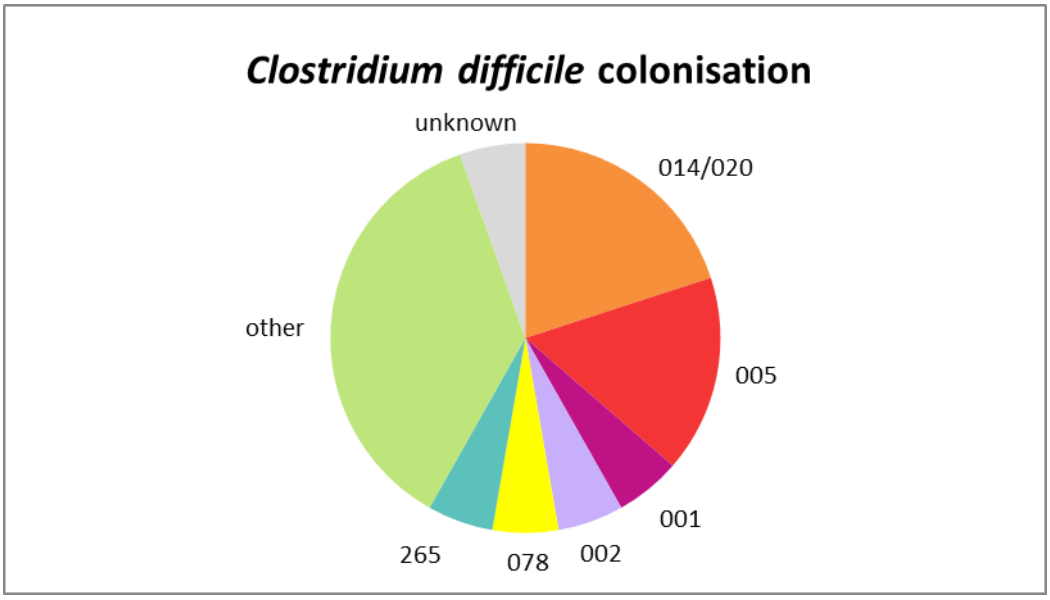
Background: Patients asymptomatically colonised with *C. difficile* are thought to play a role in the epidemiology of *Clostridium difficile* infections (CDI). Patients with *C. difficile* colonisation (CDC) on admission to a hospital are of specific interest as they can be a potential reservoir for onwards transmission to other patients, or could progress to symptomatic CDI themselves. We studied the prevalence of CDC on admission to 3 hospitals across the Netherlands.

Material/methods: A multi-centre cohort study was performed in 2 university-affiliated (hospital A and B) and 1 general hospital (hospital C) across different regions in the Netherlands. Adult patients admitted to medical or surgical wards were enrolled from January 2015 to April 2016. Stool specimens or rectal swabs were collected within 72 hours of admission to the hospital and cultured for *C. difficile*. For rectal swabs, an additional culture after broth enrichment was performed. An in-house GLuD PCR, toxinotyping and PCR ribotyping were performed on all recovered isolates. During the study period, all CDI cases in hospitalized patients in the same 3 hospitals were registered and isolates of these clinical samples were also ribotyped. The distribution of ribotypes among colonised patients was compared to the distribution of ribotypes among hospitalised patients with CDI.

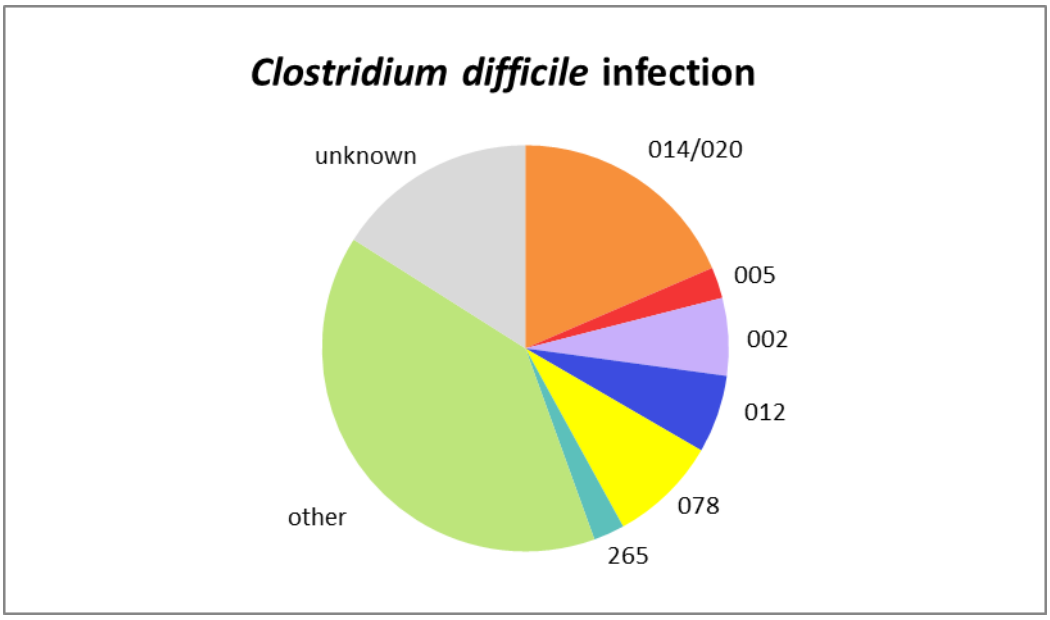
Results: . In total, 2133 samples were obtained (from 49.4% of enrolled patients; 525 in hospital A, 597 in hospital B and 1011 in hospital C). Of all samples, 1664 (78%) were stool samples and 469 (22%) were rectal swabs. Samples obtained after a hospital stay of more than 72hrs (n=320) were excluded from further analyses. The overall prevalence of CDC on admission was 4.9% (4.2% in hospital A, 6.3% in hospital B and 4.3% in hospital C). The overall prevalence of toxigenic CDC on admission was 3.0%. There were no differences in age or proportion of male patients between CDC and non-colonised patients (58.1 +/- 17.6 vs 60.8 +/- 15.9 years, p=0.06 and 55.1% vs 52.8% males, p=0.68) or between patients colonised by toxigenic or non-toxigenic strains (58.9 +/-17.6 vs 56.1+/-18.2, p=0.76 and 56.4 vs 51.6% males, p=0.67). Thirty-seven different ribotypes were identified

among CDC patients, the most frequently encountered ribotypes in CDC patients were 014/020 (20.0%), 005 (16.4%), 001 (5.5%), 002 (5.5%), 078 (5.5%, 1 patient in each hospital) and 265 (5.5%). During the study period 81 CDI cases were reported. Most frequently encountered ribotypes in CDI patients were 014/020 (18.5%), 078 (8.6%), 002 (6.2%) and 012 (6.2%). Ribotype 027 was not found among CDC or CDI patients.

Conclusions: In this multi-centre study, the prevalence rates of CDC and toxigenic CDC on admission to the hospital were 4.9% and 3.0%, respectively. Similar ribotypes were found in CDC and CDI patients.



A.



B.

Figure. A. Distribution of the most common ribotypes among patients colonised on admission. B. Distribution of the most common ribotypes among patients with *Clostridium difficile* infection.