

High prevalence of Binary Toxin producing *Clostridium difficile* among hospitalized symptomatic patients in western Austria 2014

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Objectives

Several prevalence studies in Austria during the last years demonstrated a rising number of binary toxin producing *C. difficile* in hospitalized patient due to ribotype 027 in eastern Austria but not in the western parts of the country. Therefore we set up a regional investigation in the county of Salzburg.

Methods and study design

A prospective incidence study of consecutive stool samples was performed from December 2013 to August 2014 characterizing molecular pattern of 110 detected *Clostridium difficile* isolates originating from 6 hospitals (including our university hospital). PCR-ribotyping and detection of the genes for toxin A, toxin B and binary toxin from cultured specimens were performed. In addition, the three most abundant deletions in *tcdC* gene were investigated in parallel and correlated with binary toxin production and PCR-ribotype.

Results

In 19 isolates (17,3% of all 110 samples) the binary toxin gene was detected (Fig.1). Ribotype 078 belonged with in a total 10 isolates to the most frequent ribotype (Fig.1). Another four binary toxin positive isolates were derived from a single patient with recurrent disease and identified as ribotype 027. The remaining four isolates of binary toxin positives belonged to other various ribotypes (Fig.1). Regarding the ribotype distribution among all isolates the most common ribotype found was ribotype 001 (11 isolates, 10%) (Fig.2).

Moreover, detecting the *tcdC* deletions we have found 9 isolates with 18 bp deletion not associated with ribotype 027. Those isolates were tested as binary toxin positive or negative and belonged to different ribotypes (001, 080, 081, AI-84, 131, 235) (Fig.3). Three isolates out of 13 with 36 bp deletion were not associated with ribotype 078 (413, 003) (Fig.4).

Within the ribotype 078 - or 001 patient group no clinical-epidemiological link or suspected transmission has been demonstrated suggesting the prevalence derived from the community. Severe clinical conditions of clinical manifestation could not be correlated with so called hypervirulent strains.

Conclusion

Considerably high prevalence of binary toxin producing *C. difficile* was found for the first time in a patient cohort in western Austria. Due to laboratory diagnostics lacking routine detection of the binary toxin gene until now, the number of CDI patients with ribotype 078, 027 and others was underestimated inadvertently in the community. These observations urge to further alterations in the routine laboratory diagnostics and broader clinical and epidemiological investigations.

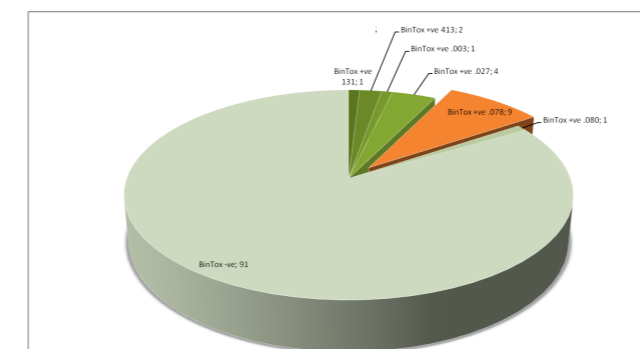


Fig. 1 17.3% of all stool samples positive for Binary Toxin Gene

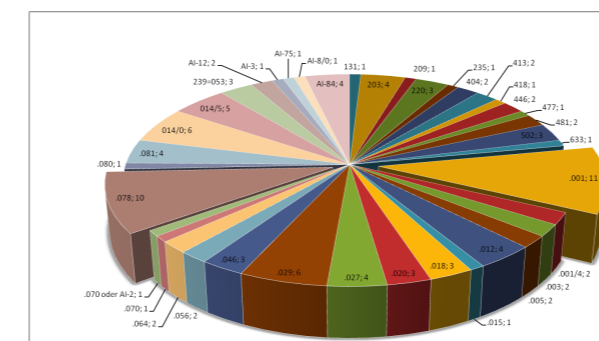


Fig. 2 PCR- Ribotyp-distribution

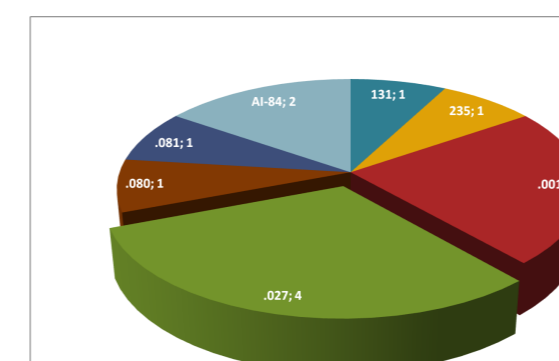


Fig. 3 Distribution of PCR - Ribotypes with 18 bp deletion

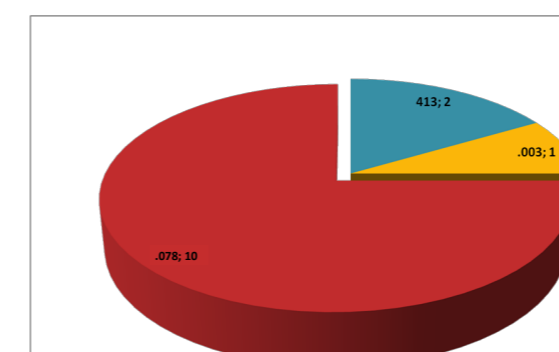


Fig. 4 Distribution of PCR - Ribotypes with 36 bp deletion