

FIRST CONFIRMED CASES OF *CLOSTRIDIUM DIFFICILE* PCR RIBOTYPE 027 IN NORWAY

A Ingebretsen (andre.ingebretsen@rikshospitalet.no)^{1,2}, G Hansen³, C Harmanus⁴, E J Kuijper⁴

1. Department of Infection Prevention, Rikshospitalet, Oslo, Norway

2. Institute of Microbiology, Rikshospitalet, Oslo, Norway

3. Department of Microbiology, Aker University Hospital, Oslo, Norway

4. Department of Medical Microbiology, Leiden University Medical Center, Leiden, the Netherlands

Since 2003, the emergence and distribution of a hypervirulent strain of *Clostridium difficile* PCR ribotype 027 has been described in North America, Japan and several European countries [1-6]. In December 2007, *C. difficile* PCR ribotype 027 was found in two cases of *C. difficile*-associated disease treated in a hospital in Oslo, Norway.

Case reports

The first case, a woman in her eighties living in a nursing home in Oslo, was diagnosed in September 2007 with a urinary tract infection and treated with mecillinam. Twenty-four hours after initiating treatment, she was admitted to a local hospital with a diagnosis of diverticulitis, for which she was treated with ciprofloxacin and metronidazole. She was then transferred to a hospital in Oslo, where computer tomography scanning revealed abdominal abscesses and the colonoscopy showed pseudomembranous colitis. *C. difficile* toxin A was detected in a stool specimen. The treatment was changed to oral vancomycin and she was discharged from the hospital. She was readmitted 38 days later with a diagnosis of acute abdominal pain and toxic megacolon. Total colectomy was performed and biopsies revealed pseudomembranous colitis. The patient was discharged from the hospital eight days later.

The second case, another woman in her eighties, had a history of several admissions to two hospitals and one nursing home in Oslo during the autumn of 2007. In early November 2007, the patient had fever and constipation. She was treated with ciprofloxacin and metronidazole. Mechanical ileus was eventually diagnosed and laparotomy with resection of parts of the ileum was performed. Around two weeks later, she developed diarrhoea, and *C. difficile* toxin A was detected in a stool specimen. She was then treated with metronidazole. Her clinical condition worsened, and she died 13 days later due to the consequences of a severe pneumonia.

Laboratory characterisation

Stool specimens of both patients were positive for *C. difficile*. The isolates were further characterised in December 2007 as *C. difficile* PCR ribotype 027 by PCR ribotyping [7], and both contained the genes for toxin A, toxin B, and the binary toxin. In addition, an 18 base pair deletion in *tcdC* was present. Both isolates were further characterised by multilocus variable-number tandem-repeats analysis (MLVA). The MLVA profiles of the isolates differed only by one repeat at one locus and must be considered as clonal [8]. A comparison with other MLVA profiles in the database at the reference laboratory for *C. difficile* in Leiden indicated that the two isolates are most closely related to the *C. difficile* PCR ribotype 027 strains circulating in the Netherlands rather than the 027 strains in other European countries.

Susceptibility testing by E-tests revealed a typical pattern of clindamycin-susceptible and fluoroquinolone-resistant type 027. This pattern is similar to the other European 027 strains [9].

Investigations on the epidemiological relatedness of the two strains are ongoing, since it is very likely that the two cases are a part of a clonal spread of one MLVA type in the nursing homes or the hospitals involved.

Conclusion

We advise microbiological laboratories to start cultivating toxin A- and toxin B-positive stool samples and to apply typing methods on the isolates to obtain more insight in the circulating *C. difficile* types.

References

1. Kuijper EJ, Coignard B, Tull P. Emergence of *Clostridium difficile*-associated disease in North America and Europe. *Clin Microbiol Infect.* 2006;12 Suppl 6:2-18.
2. Kuijper EJ, Coignard B, Brazier J, Suetens C, Drudy D, Wiuff C, et al. Update of *Clostridium difficile*-associated disease due to PCR ribotype 027 in Europe. *Euro Surveill.* 2007;12(6). Available from: <http://www.eurosurveillance.org/em/v12n06/1206-221.asp>
3. Lyytikäinen O, Mentula S, Kononen E, Kotila S, Tarkka E, Anttila V, Mattila E, Kanerva M, Vaara M, Valtonen V. First isolation of *Clostridium difficile* PCR ribotype 027 in Finland. *Euro Surveill.* 2007;12(11);E071108.2. Available from: <http://www.eurosurveillance.org/ew/2007/071108.asp#2>
4. Zaiß NH, Weile J, Ackermann G, Kuijper E, Witte W, Nübel U. A case of *Clostridium difficile*-associated disease due to the highly virulent clone of *Clostridium difficile* PCR ribotype 027, March 2007 in Germany. *Euro Surveill.* 2007;12(11);E071115.1. Available from: <http://www.eurosurveillance.org/ew/2007/071115.asp#1>
5. Kleinkauf N, Weiss B, Jansen A, Eckmanns T, Bornhofen B, Kühnen E, Weil H-P, Michels H. Confirmed cases and report of clusters of severe infections due to *Clostridium difficile* PCR ribotype 027 in Germany. *Euro Surveill.* 2007;12(11);E071115.2. Available from: <http://www.eurosurveillance.org/ew/2007/071115.asp#2>
6. Kato H, Ito Y, van den Berg R, Kuijper EJ, Arakawa Y. First isolation of *Clostridium difficile* 027 in Japan. *Euro Surveill* 2007;12(1);E070111.3. Available from: <http://www.eurosurveillance.org/ew/2007/070111.asp#3>
7. Bidet P, Barbut F, LaLande V, Burghoffer B, Petit J-C. Development of a new PCR-ribotyping method for *Clostridium difficile* based on ribosomal RNA gene sequencing. *FEMS Microbiol Lett.* 1999;175:261-266.
8. van den Berg RJ, Schaap I, Templeton KE, Klaassen CH, Kuijper EJ. Typing and subtyping of *Clostridium difficile* isolates by using multiple-locus variable-number tandem-repeat analysis. *J Clin Microbiol.* 2007;45:1024-8.
9. Barbut F, Mastrantonio P, Delmée M, Brazier J, Kuijper EJ, Poxton I. Prospective study of *Clostridium difficile* infections in Europe with phenotypic and genotypic characterization of the isolates. *Clin Microbiol Infect.* 2007;13:1048-1057.

This article was published on 10 January 2008.

Citation style for this article: Ingebretsen A, Hansen G, Harmanus C, Kuijper EJ. First confirmed cases of *Clostridium difficile* PCR ribotype 027 in Norway. *Euro Surveill.* 2008;13(2);pii=8011. Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=8011>