

## *Clostridium difficile* PCR Ribotype 078: an Emerging Strain in Humans and in Pigs?

In a recent paper, Keel and colleagues concluded that *Clostridium difficile* PCR ribotype 078 was the most common PCR ribotype among isolates from swine (83% of 119 isolates) and isolates from calves (94% of 33 isolates) in The United States (1). In contrast, only 1 of 23 human isolates collected from two hospitals belonged to type 078. The recent finding of Songer et al. that type 078 is frequently found in meat products suggests that transmission from animals to humans is possible (J. G. Songer, H. T. Trinh, A. D. Thompson, G. E. Killgore, L. C. McDonald, and B. M. Limbago, presented at the Second International *Clostridium difficile* Symposium, Maribor, Slovenia, 6 to 9 June 2007). Our results from The Netherlands are in agreement with the hypothesis and indicate that *C. difficile* type 078 is of more clinical importance than was reported by Keel and colleagues (1).

In a 2-month period in 2005, 17 hospitals participated in a surveillance study of the incidence of *Clostridium difficile*-associated diarrhea (CDAD) in The Netherlands (2). PCR type 078 was found in 5 out of 67 (7.5%) CDAD patients and represented the third most frequently occurring type, after type 027 (16%) and type 014 (16%). In 2006, a surveillance study in a 982-bed hospital located in Amersfoort revealed 105 patients with CDAD, where type 078 was present in 3 patients (3.9%). In 2007, we performed a surveillance study in a 1,004-bed hospital in Zwolle and found type 078 to be present in 5 out of 47 patients (10.6%). All 13 type 078 isolates belonged to toxinotype V, contained the genes *tcdA* and *tcdB*, were binary toxin positive, and had a 39-bp deletion in *tcdC*. The average age of 13 patients was 63 years, ranging from 8 to 85 years, and all had one or more comorbid conditions. A health care onset was observed in 6 (46%) patients and a community onset in 7 (54%) patients, 3 of whom had been discharged in the 3 months prior to the onset of CDAD (health care association) and 4 of whom had not previously been admitted to a health care facility (community association). Severe diarrhea was present in nine patients (69%). Two patients died within 30 days of diagnosis, one death (8%) being attributable to CDAD.

In accordance with the findings of Keel and coworkers, we also found *C. difficile* ribotype 078 in pigs, but in our case, this ribotype was exclusive and was found only in diarrheal neonatal piglets in 6 out of 12 diseased and sampled litters (S. B. Debast, L. A. M. G. van Leengoed, C. Harmanus, E. J. Kuijper, and A. B. Bergwerff, submitted for publication). At the pathological investigation, these animals typically showed colitis. Like our hospital isolates, piglet-derived *C. difficile* ribotype 078 contained the genes *tcdA* and *tcdB*, were binary toxin positive, and had a 39-bp deletion in *tcdC*.

We conclude that *C. difficile* PCR ribotype 078 is a frequently encountered pathogen of CDAD in the human population in The Netherlands, represented mainly as a community onset disease. Since type 078 is also found as an important pathogen of CDAD in pigs, studies are currently ongoing to investigate this association in more detail.

### REFERENCES

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**Author's Reply**

Much of the information regarding ribotype 078/toxinotype V strains as human pathogens emerged during the process of publication of Keel et al. (1). Data on the occurrence of this genotype of *Clostridium difficile* in humans are neither extensive nor conclusive, but I agree with the authors that some sort of connection among food animals, foods, and humans is likely. Data in another of our publications (2) suggest that human strains arose from those found in pigs.

**REFERENCES**

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