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Letter to the Editor

# Transmission of methicillin-resistant *Staphylococcus intermedius* between humans and animals

*Keywords:* *Staphylococcus intermedius*; Methicillin-resistant; Transmission; Animals; Humans

At the Veterinary Microbiological Diagnostic Center (VMDC) of Utrecht University methicillin-resistant *Staphylococcus intermedius* (MRSI) were cultured from infected surgical wounds of five dogs and one cat over a short period of time (June 2006–April 2007). All patients had undergone surgery at the same private veterinary clinic (clinic A). Identification of *S. intermedius* and antimicrobial susceptibility tests were performed as described (van Duijkeren et al., 2004). These isolates appeared to be resistant against ampicillin, amoxicillin with clavulanic acid, cephalexin, ceftiofur, ceftazidime, enrofloxacin, gentamicin, kanamycin, chloramphenicol, lincomycin, clindamycin, tetracycline and trimethoprim/sulphamethoxazole and susceptible to fusidic acid and rifampicin. Our suspicion that they were MRSI was confirmed by a positive *mecA* PCR. At this point, the clinic became suspected to be the source of the infections because MRSI is uncommon in The Netherlands, since all isolates had the same remarkable resistance pattern and all patients had undergone surgery at this clinic. Personnel at the clinic was sampled; samples from the nose were taken from the surgeon and six nurses/technicians who regularly assisted during surgery. These samples were taken with informed consent. MRSI with the same resistance pattern were cultured from the nose of the surgeon and three technicians. Subsequently, 22 environmental samples were taken from several sites at the surgery, the waiting-room, the kitchen and the staff-members room, to examine whether the environment was contaminated. A sterile gauze was rubbed over the surface, submerged and incubated in 15 ml MRSA broth (Busscher et al., 2006). After incubation at 37 °C for 48 h the broth was plated on sheep blood agar which was incubated at 37 °C for 24 h. Four environmental samples were positive for *S. intermedius*: the cupboard in the surgery, the staff members' room, the shelf behind the counter in the waiting room and a cupboard in the dark room. Antimicrobial susceptibility was determined and all isolates were multidrug-resistant with the same resistance pattern as the isolates from the patients. They were also *mecA* positive by PCR. Additional samples were taken from the nose and coat of two healthy dogs of staff members at the clinic; one of the dogs (regularly present at the clinic) also carried MRSI with the above characteristics. Thirteen MRSI isolates (from six patients, a healthy dog, four humans and two environmental samples) were genotyped by PFGE according to the Harmony protocol (Murchan et al., 2003). *Staphylococcus aureus* ATCC 29213 served as control. Four single MRSI isolates from other veterinary clinics (B, C, D and E) in The Netherlands, and five methicillin-susceptible *S. intermedius* isolates from two carriers and three patients at clinic A, isolated during the same time period, were included. The PFGE profiles from the methicillin-resistant *S. intermedius* isolates from clinic A were indistinguishable and differed from the profiles of the

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other isolates (Fig. 1). We conclude that the methicillin-resistant isolates from clinic A were epidemiologically related. We do not know the index case, but most likely it was a dog since *S. intermedius* is a commensal and pathogen in dogs. It is seldom isolated from the normal flora of humans even those with frequent exposure to animals (Madoudeau et al., 1997; Talan et al., 1989a). In the nasopharyngeal flora of 144 healthy veterinary staff members *S. intermedius* was only found once (Talan et al., 1989a). In our case, it seems likely that the veterinary surgeon and/or the nurses were the source of the wound infections because they were present during surgery. The dogs and cat had no contact with each other.

In several case reports zoonotic transmission of methicillin-susceptible *S. intermedius* between dogs and humans was reported. *S. intermedius* in humans has been associated with dog bite wounds (Talan et al., 1989b), bacteraemia (Vandenesch et al., 1995), pneumonia (Gerstadt et al., 1999) and ear infections (Kikuchi et al., 2004; Tanner et al., 2000). Guardabassi et al. (2004) demonstrated that owners of dogs affected by deep pyoderma often carry the same *S. intermedius* strains as their dogs. Although *S. intermedius* rarely causes disease in humans its prevalence may be underestimated because *S. intermedius* may be misidentified as *S. aureus* because it is coagulase positive, produces thermonuclease and clumping factor.

To our knowledge, this is the first report on the transmission of methicillin-resistant *S. intermedius* between humans and animals. People working at veterinary clinics should be aware of this risk for their own and their patients' sake.

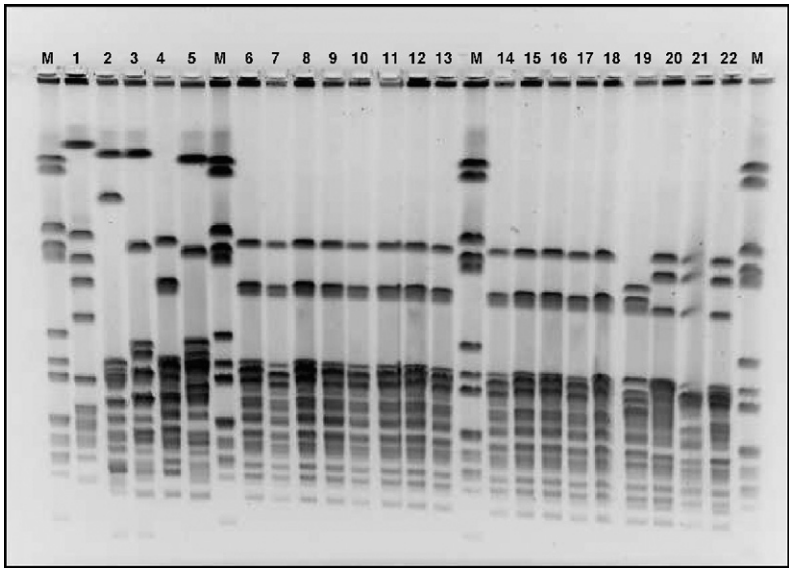


Fig. 1. Pulsed-field gel electrophoresis profiles of the isolates. (M) *S. aureus* ATCC 29213; (1) methicillin-susceptibe *S. intermedius* from healthy human carrier at clinic A; (2) methicillin-susceptibe *S. intermedius* from healthy carrier dog at clinic A; (3) methicillin-susceptibe *S. intermedius* from dog with pyoderma from clinic A; (4) methicillin-susceptibe *S. intermedius* from dog with wound infection at clinic A; (5) methicillin-susceptibe *S. intermedius* from dog with wound infection at clinic A; (6) methicillin-resistant *S. intermedius* from veterinary surgeon at clinic A; (7) methicillin-resistant *S. intermedius* from healthy carrier dog at clinic A; (8) methicillin-resistant *S. intermedius* from dog with wound infection at clinic A (case 5); (9) methicillin-resistant *S. intermedius* from human carrier at clinic A; (10) methicillin-resistant *S. intermedius* from dog with wound infection (case 1) at clinic A; (11) methicillin-resistant *S. intermedius* from dog with wound infection (case 2) at clinic A; (12) methicillin-resistant *S. intermedius* from cat with wound infection (case 3) at clinic A; (13) methicillin-resistant *S. intermedius* from dog with wound infection (case 4) at clinic A; (14) methicillin-resistant *S. intermedius* from healthy human carrier at clinic A; (15) methicillin-resistant *S. intermedius* from healthy human carrier at clinic A; (16) methicillin-resistant *S. intermedius* from environmental sample at clinic A; (17) methicillin-resistant *S. intermedius* from environmental sample at clinic A; (18) methicillin-resistant *S. intermedius* from dog with wound infection (case 6) at clinic A; (19) methicillin-resistant *S. intermedius* from dog with pyoderma at clinic B; (20) methicillin-resistant *S. intermedius* from dog with pyoderma at clinic C; (21) methicillin-resistant *S. intermedius* from cat with wound infection at clinic D; (22) methicillin-resistant *S. intermedius* from dog with wound infection at clinic E.

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