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Isolation of *Streptococcus suis* from the urine of a clinically ill dog

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Streptococcus suis is an important pathogen of swine causing meningitis, sudden death, septicemia, polyserositis, endocarditis, and pneumonia (1). It is also an important human pathogen affecting people working with pigs or pork meat in many countries throughout the world (2). Thirty-five serotypes have been reported. The distribution of serotypes in swine varies depending on the geographical origin of the samples, with serotypes 2, 1/2, 3, and 8 being the most common serotypes isolated from pigs in Quebec (3), a province where serotyping of isolates is routinely performed. Serotypes 2 and 14 are the most common types isolated from humans, with cases already described in Canada (2). In addition to swine and humans, *S. suis* has been isolated from a variety of mammals and birds (1).

We present here the first report of a *S. suis* strain recovered from an ill dog. A 6-year-old female, spayed Labrador retriever presented to the Atlantic Veterinary College Teaching Hospital with a 1-week history of lethargy, anorexia, polyuria and polydipsia, and intermittent vomiting. On physical examination, the dog was lethargic and mildly febrile (39.5°C). A complete blood (cell) count was unremarkable except for a mild monocytosis (1.54×10^9/L). Serum biochemistry analysis revealed a mild hyperglycemia (6.3 mmol/L, reference range: 3.3 to 5.6 mmol/L) and elevated liver enzymes [alkaline phosphatase 640 U/L, reference range: 23 to 87 U/L; aspartate aminotransferase (AST) 65 U/L, reference range: 20 to 50 U/L; alanine aminotransferase (ALT) 195 U/L, reference range: 5 to 69 U/L; γ-glutamyl transferase (GGT) 12 U/L, reference range: 0 to 8 U/L). Urinalysis of a sample collected by cystocentesis revealed minimally concentrated urine (specific gravity 1.021) and 1+ bacteria in a noninflammatory sediment [1–2 neutrophils/400×; 0–1 red blood cells (RBCs)/400×; 0–1 transitional cells/400×]. Urine culture on sheep blood agar after 24 h aerobic incubation at 37°C yielded a pure growth of small numbers of small moist, translucent-to-white colonies with a zone of incomplete (green) hemolysis. There was no growth on MacConkey agar. Colonies were catalase-negative and a Gram stain revealed gram-positive cocci. The isolate gave a positive amylase test on starch agar. It was identified as *S. suis* (group 1) by API 20 Strep (BioMérieux Canada, Montreal, Quebec) (94.4% probability), and as *S. suis* by Sensititre (Trek Diagnostic Systems, Cleveland, Ohio, USA) (100%). The first choice identification by the Biolog Micro Station System (Biolog, Hayward, California, USA) was *S. suis* (serogroup 5) (100% probability). *S. suis* identity was confirmed by a species-specific PCR (3) and by sequencing of 16S rRNA genes. Serotyping was carried out using the coagglutination test with reference antisera (3). The isolate was confirmed to belong to a typical *S. suis* serotype 8.

Although isolation of *S. suis* from ill dogs had never been reported, Devriese et al (4) showed that 20% of streptococci isolated from dogs' tonsils were biochemically identified as *S. suis.* A few non-typable *S. suis* isolates have also been recovered from tonsils of dogs by Salasia et al (5). Strains from both studies were characterized biochemically only. In contrast to strains usually found in pigs, *S. suis* strains from dogs have been reported to be able to ferment mannitol (4). The *S. suis* strain in this present study was mannitol negative, similar to swine strains.

This particular dog had no apparent history of exposure to pigs or a farm environment, however, she had previously been fed commercial pig ear treats. Human outbreaks of *Salmonella* related to contaminated pig ear treats in Canada have been described (6). In spite of new recommendations applied in the industry to reduce the risk, a recent follow-up investigation found a 4% prevalence of *Salmonella* from commercial pig ear treat samples (7). These studies indicate that pig ear treats should still be considered as a possible source of *Salmonella* and other zoonotic agents isolated from pigs. *Streptococcus suis* is reported to survive in carcasses, feces, and dust for extended periods (1), but its ability to survive in a product such as a smoked pig ear has not been documented. It is interesting to speculate that the pig ear treat eaten by the dog just prior to the onset of clinical illness may have been the source of the *S. suis* infection, but further investigation of this connection was not possible. An ultrasonographic examination of the dog's abdomen might have provided evidence of the origin of the *S. suis* urinary tract infection, possibly differentiating pyelonephritis from cystitis, and would have allowed further investigation of the liver enzyme abnormalities; however, the dog's owner declined further diagnostic tests. The dog was placed on cephalexin (Novo-lexin; Novopharm, Toronto, Ontario), 24 mg/kg, PO, q12h, pending antibiotic sensitivity results. Once sensitivity to cephalexin was

confirmed, therapy was continued for a total of 4 wk. The owner reported that all of the dog's clinical signs resolved within 48 h of initiating antibiotic therapy, and she remained free of clinical illness after therapy was completed.

This is the first report in the literature of a *S. suis* recovered from a clinically ill dog and also the only canine isolate that has been genetically confirmed as *S. suis.*

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