

Sharing a microbe with man's best friend: A case of canine streptococcal infection in a diabetic patient

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SUMMARY

We report a case of a diabetic patient with an infected leg wound leading to septicemia and abscess formation in the contra-lateral leg due to *Streptococcus canis*. This organism belongs to the Lancefield group G and is more commonly found in dogs. It is often mistaken for *Streptococcus dysgalactiae* which is a human strain of streptococci. Infections in humans are not common and usually involve infected wounds or ulcers and the surrounding soft tissue. In most reported cases, patients had close contact with domestic dogs and a pre-existing wound as a portal of entry. Our patient recovered after surgical debridement and drainage of abscess together with antibiotics. This organism is sensitive to common antibiotics like penicillin, amoxicillin, cephalosporins and erythromycin. The incidence of infections due to *Streptococcus canis* may be under-reported as laboratories may just report an isolate as group G streptococcus. Susceptible patients with wounds or ulcers should be counselled on proper wound care and advised to avoid or minimise contact with the family dog.

KEY WORDS:

Streptococcus canis; dogs; diabetes mellitus; infected wound

INTRODUCTION

Ever since man domesticated the wolf, dogs have had a close relationship with humans. Apart from being a companion, dogs have been used to hunt, herd, guard and pull sleds. Invariably, zoonotic infections from dogs will occur in humans due to this close relationship. Here we report a case of a patient with an infected leg wound leading to septicaemia and abscess formation in the contra-lateral leg due to an organism which is more commonly found in dogs.

CASE REPORT

A 57-year-old gentleman presented to us with one-week history of fever, lethargy and giddiness. He had sustained a laceration wound over the dorsum of his right foot one month earlier following a motor-vehicle accident. The wound was noted to be infected and had a foul smelling discharge. He also had spreading cellulitis over the left foot. The patient denied having any wound over the left foot prior to this. He was hypotensive with blood pressure of 79/46 mmHg, pulse rate 101 beats per minute and temperature 36.3°C.

The patient had been diagnosed with type 2 Diabetes Mellitus and hypertension for the past 20 years. He was not known to have any micro or macro-vascular complications. He was on basal bolus insulin for his diabetes but he omitted his regular insulin doses for the last three days due to poor oral intake. The initial capillary blood sugar reading was 11.1 mmol/l. He did not smoke or drink alcohol.

The patient was resuscitated with intravenous fluids and started on inotropes. His haemoglobin was 9.4 g/dl, White Cell Count (WCC) 10,900/l (predominantly neutrophils) and platelets 287,000/l. He also had evidence of acute renal failure with urea of 16.7 mmol/l, potassium 5.4 mmol/l and creatinine 274 umol/l. X-ray of the right foot did not show any air shadows in the surrounding soft tissue but the 5th metatarsal had osteomyelitic changes. Blood and pus samples were taken for culture and sensitivity and the patient was started on IV Sulbactam/Ampicillin combination and oral Clindamycin. His blood sugar was controlled with regular subcutaneous short and intermediate acting insulin. The patient subsequently underwent wound debridement and bone curettage of the right foot. His blood pressure stabilized and inotropes were discontinued.

However, the patient remained febrile with spikes of temperature up to 39.4°C. The cellulitis over the left leg worsened and he developed an abscess over the dorsum of the left foot. Antibiotics were then changed to IV Meropenem to cover for the possibility of melioidosis. Incision and drainage of the left foot abscess was carried out. His condition improved progressively after that and he became afebrile.

Both the blood and swab culture isolated *Streptococcus canis* (group G), which was sensitive to Cefotaxime, Ceftriaxone, Clindamycin, Erythromycin and Penicillin but resistant to Tetracycline. Meropenem was de-escalated to IV Ceftriaxone 2 g daily. Upon further questioning, the patient has two pet dogs at home. He denied ever being bitten by them before. The dogs were kept outside the house but he has regular close contact with them. Unfortunately, we were not able to obtain cultures from our patient's dogs.

The patient's renal profile improved with urea 6.5 mmol/l, potassium 4.4 mmol/l and creatinine 118 umol/l and he remained afebrile. He was discharged after 11 days and was given another 7 days of oral Sulbactam/Ampicillin combination.

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DISCUSSION

Streptococcus canis is a B-hemolytic Lancefield group G streptococci, which is often mistaken for *Streptococcus dysgalactiae*. While *Streptococcus dysgalactiae* is considered a human strain of streptococci, which causes pathology in humans like respiratory tract infections, skin and soft tissue infections, septic arthritis, osteomyelitis, endocarditis, meningitis, puerperal infections and neonatal sepsis, *Streptococcus canis* is a zoonotic streptococcal strain. Although its name is derived from the word canine, it is not exclusive to dogs and has been isolated from other animals like cats, harbour porpoises, cows, mice, rats and rabbits.¹

Streptococcus canis can be isolated as commensal flora from the skin, oropharynx, genito-urinary tract and anus of healthy dogs. It can also cause diseases like urinary tract infections, abortions, vaginitis, metritis, skin infections, necrotising fasciitis and toxic shock syndrome in dogs.¹

Streptococcus canis infections in humans are not common and usually involve infected wounds or ulcers and the surrounding soft tissue. In most reported cases, patients had close contact with domestic dogs and a pre-existing wound as a portal of entry.¹ Diabetics also appear to be more susceptible. However, the incidence of this organism is likely to be under reported as laboratories may just report an isolate as group G streptococcus. Differentiating between *Streptococcus dysgalactiae* and *Streptococcus canis* is based on their biochemical and enzymatic profiles or DNA hybridization studies.² Over the past year, Hospital Raja Permaisuri Bainun, Ipoh have not reported any isolate of *Streptococcus canis* from specimens apart from this patient. Identification of *Streptococcus canis* in our laboratory is based on identifying a streptococcal species on gram stain and colony morphology with B-hemolytic properties. The Lancefield grouping of the isolate is then identified i.e. group

G. To differentiate between *Streptococcus dysgalactiae* and *Streptococcus canis*, the API Strep System based on biochemical characteristics was used. The API Strep System has an identification of 99.9% for *Streptococcus canis*.³ 16S rRNA gene analysis was not performed, as this was not routinely done and not available in our laboratory.

Management of *Streptococcus canis* infections include prompt debridement of infected tissue, drainage of pus collection and antibiotics. This organism is sensitive to common antibiotics like penicillin, amoxicillin, cephalosporins and erythromycin. However, there are some studies which report erythromycin resistance of up to 23.5%.¹

Susceptible patients with wounds or ulcers should be counselled on proper wound care and advised to avoid or minimize contact with the family dog.

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