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Scientific Report

First report of *Pasteurella dagmatis* isolation from a bitch urine in Iran

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Summary

Pasteurella species are commensal bacteria of the respiratory airways and oronasal cavity of animals. In this study, we report an unusual case of *Pasteurella dagmatis* isolation from dog urine with uroliths. An 11-year-old female dog was admitted to the Veterinary Hospital of Ahvaz University complaining of abdominal pain, hematuria, dysuria and stranguria. In clinical and radiological examinations, it was found that abdomen was distended due to urinary bladder obstruction with uroliths. *Pasteurella dagmatis* was isolated from urine specimen collected by cystocentesis. Finally, uroliths were removed by surgery. Appropriate antibiotic treatment with cephalexin caused improvement. To the best of our knowledge, this is the first report of *P. dagmatis* presence in dog urine.

Key words: *Pasteurella dagmatis*, Bitch, Urine, Urolith, Ahvaz

Introduction

Pasteurella species are small, nonmotile, gram-negative, bipolar-staining aerobes present in the oropharynx of the majority of healthy dogs and cats, isolated from 20 to 30% of dog-bite wounds and more than 50% of cat-bite wounds. *Pasteurella* species cause zoonotic infections in humans. Most *Pasteurella* infections occur in people who have frequent contact with farm or pet animals. Recently, a more virulent strain of the organism, called *P. multocida dagmatis*, has been described. This bacteria, previously known as *Pasteurella* "gas", Pasteurella new species 1 or *Pasteurella pneumotropica* type Henriksen that is rarely implicated in human pathology. *P. dagmatis* is often isolated simultaneously with other bacteria and mis-identification may have contributed to the slightly underestimated frequency of its isolation. *Pasteurella* acquired from pets may also cause a variety of upper respiratory tract infections, including tonsillitis, sinusitis, and epiglottiditis (Talan *et al*., 1999; Ettinger *et al*., 2005). We report an unusual case of *Pasteurella dagmatis* isolation from a dog urine with uroliths. To the authors' knowledge, this is the first reported case of *P. dagmatis* isolation in dog urine.

Materials and Methods

An 11-year-old female terrier breed dog was admitted to the Veterinary Hospital of Ahvaz complaining of abdominal pain, hematuria, dysuria and stranguria. The affected dog was examined clinically and paraclinically including a complete blood count (CBC). Urinalysis (by cystocentesis during surgery) and radiography (lateral and ventrodorsal views) from abdomen region were accomplished. The sample of urine was sent to the Department of Microbiology, School of Veterinary Medicine of Ahvaz for

urine culture. The culture medium used in this study was trypticase soy agar supplemented with 5% defibrinated sheep blood, chocolate agar, Rose agar and MacConkey (Quinn, 1994). Finally, stones were removed by surgery (Fig. 1).

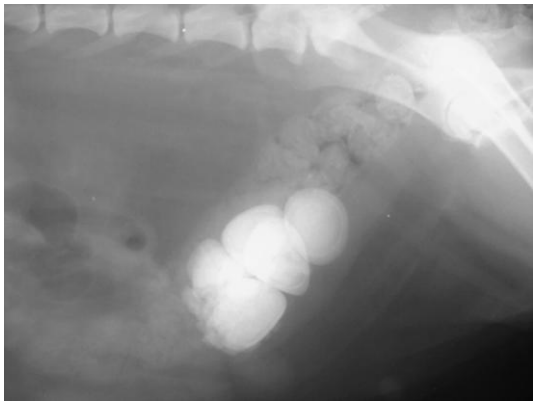

Fig. 1: Lateral radiograph showing uroliths in urinary bladder of affected dog

Results

The general clinical examinations showed that the temperature, heart rate and respiratory rate were 39.2°C, 125 beats/min and 36/min, respectively. The abdomen was distended due to urinary bladder obstruction with uroliths. Laboratory tests showed a normal white blood cell count (WBC = 12500 cells/µl). Results of urinalysis were as follow: RBC: 15 per HPF, WBC: 10 per HPF, Epithelial cells: 4 per HPF, Bacteria: 4 per HPF and Casts: 3 per HPF. Radiography showed many stones in urinary bladder. The composition of stones was mixture of calcium oxalate (60%) and calcium phosphate (40%). *Pasteurella dagmatis* was isolated from the urine that had been taken by cystocentesis. This bacterium grew on blood agar after 24 h as 3+ pure medium size non-hemolytic grayish colonies, which did not grow on MacConkey agar. Smear from colonies revealed small gram-negative coccobacilli that was oxidase and catalase positive. *Pasteurella dagmatis* was identified based on routine biochemical reactions. Treatment with first-generation cephalosporins (cephalexin with dosage 20 mg/kg PO q8h for 2 weeks) was successful. The second culture was negative for *pasteurella dagmatis*, two weeks after treatment.

Discussion

To our knowledge, this is the first report of *Pasteurella dagmatis* presence in terrier dog urine. In this research, we isolated this bacterium from urinary system that is an unusual case, because it is not among normal flora of urinary system of dogs. The incidence of *Pasteurella dagmatis* infection has been increasing in many countries. The first case of *P. dagmatis* endocarditis, occurred in a healthy man after a cat-bite (Rosenbach *et al*., 2001). The second case, complicated by vertebral osteomyelitis, involved the native mitral valve of a cirrhotic woman with a known history of animal contact (Peel, 1993). The above results show that continuous contact with small animals such as dogs or cats may be a risk factor for transmission of *Pasteurella* sp. to human.

Pasteurella dagmatis spondylodiscitis was reported in a diabetic patient and another case of prosthetic aortic valve endocarditis caused by *P. multocida* has been reported in human (Sorbello *et al*., 1994; Garcia-Hejl *et al*., 2007). In our case, the main reason of *P. dagmatis* existence in urine was unknown. Probably, as a result of septicemia the dog has been infected to this bacterium, and then it localized in urinary system without any clinical signs. The affected dog did not have any complications such as tenosynovitis, arthritis or abscesses in clinical examination.

Pasteurella multocida was identified in 43% of the dogs in the small animal hospital of Tehran University. It was found as normal flora in oral cavity of healthy dogs (Shirani *et al*., 2006).

Hubbert and Rosen (1995) showed that up to 31% of human patients had no history of animal contact or exposure (Greene, 1998). A *Pasteurella* throat abscess developed after tonsillectomy in a person that her hands were licked daily by her dog (Allison *et al*., 2005). Also *Pasteurella* peritonitis had developed in dialysis patients after a cat scratch or bite that penetrated the tubing of their home dialysis machines (Deschilder *et al*., 2000). Presumably, bites in people in urban environments are related to dog, cat, or other small animals or rodent exposure. It has double importance, because

the animal may be without clinical signs in relation to urinary system infection and had continuous shedding of bacterium in urine.

Excessive urinary calcium or oxalate excretion results in increased risk of calcium oxalate urolith formation. Also, calcium phosphate saturation in the urine is affected by the concentrations of calcium and phosphate, the urine PH, and inhibitors of the calcium phosphate crystal system (Ettinger *et al*., 2005). It seems that there has been no relationship between this bacterium and stones formation. Other causes might be involved in urolith formation in the dog.

The animal did not show any clinical signs of urinary system infection. CBC was normal and other symptoms such as abdominal pain, hematuria, dysuria and stranguria were related to stones. Our study verified the presence of *Pasteurella dagmatis* in urine of a dog with no evidence of septicemia or bacteraemia in the animal.

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