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Unexpected Isolation of *Leclercia Adecarboxylata* in Dermatitis of a Dog

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Abstract : A two-year-old intact male Labrador retriever was presented with generalized erythema, pustule and pruritus. A skin screening test revealed that there were no fleas but bacteria and dermatophytes were present. Blood testing revealed no remarkable findings. The patient was prescribed systemic medication of enrofloxacin 30 mg/kg once a day and itraconazole 10 mg/kg once a day and topical medication of 2% chlorhexidine shampoo twice a week for 2 weeks. Two weeks after the prescription, aerobic culture confirmed that the bacteria were *Leclercia Adecarboxylata* and *Pseudomonas putida* was sensitive to enrofloxacin. Therefore, more medicine was prescribed for 4 weeks to alleviate clinical signs. After six weeks of medication, clinical signs were alleviated and skin screening test revealed no remarkable findings. Bacterial and fungal skin infections are common in dogs. However, there are no reports of *Leclercia Adecarboxylata* infection even in gastrointestinal tract in veterinary medicine. This is the first report of *Leclercia Adecarboxylata* infection in dogs. This report proved that *Leclercia Adecarboxylata* can cause skin problem in dogs.

Key words **:** dog, infection, *Leclercia Adecarboxylata*, skin.

Introduction

Leclercia Adecarboxylata is a motile, Gram-negative rod, facultative anaerobic, oxidase-negative bacterium (1). This bacterium shares some of the characteristics of *Enterobacteriaceae*, therefore it was named *Escherichia Adecarboxylata* when it was the first discovered, however the common antigens of *Enterobacteriaceae* were not found in this bacterium, this bacterium was later recognized under a different genus, and was renamed as *Leclercia Adecarboxylata* (1,6,8).

Leclercia Adecarboxylata is not commonly reported in human medicine and rare reported in veterinary medicine (5, 12,14). *Leclercia Adecarboxylata* is rarely pathogenic, especially in immunocompetent patients in human medicine. In immunocompetent human patients, *Leclercia Adecarboxylata* caused various problems, which are sepsis, pneumonia, endocarditis, cholecystitis and skin problems such as cellulitis, abscess (2,4,6,8,13). However, in veterinary medicine, there are no reports about the pathogenic action of *Leclercia Adecarboxylata*. Only isolations of *Leclercia Adecarboxylata* were reported in hens' eggs and healthy domestic pigs without any clinical signs (12,14).

In this study, we confirmed *Leclercia Adecarboxylata* in dogs' skin with dermatitis. This report proved that *Leclercia Adecarboxylata* can cause dermatitis in dogs.

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Case

A two-year-old intact male Labrador retriever was presented to Kangwon National University Veterinary Medical Teaching Hospital with generalized erythema, pustule and pruritus (Fig 1).

A skin screening test revealed that there were no fleas but bacteria and dermatophytes were present. Blood testing revealed no remarkable findings. The patient was prescribed systemic medication of enrofloxacin 30 mg/kg once a day and itraconazole 10 mg/kg once a day and topical medication of 2% chlorhexidine shampoo twice a week for 2 weeks. Two weeks after the prescription, aerobic culture confirmed that the bacteria were *Leclercia Adecarboxylata* (Fig 2) and *Pseudomonas putida*. These bacteria were sensitive to tetracyclines, aminoglycosides, B-lactams, quinolones, trimethoprim/sulfamethoxazole and chloramphenicol. 2 weeks after the prescription, the pustule alleviated, however the patient still had erythema and pruritus. A skin screening test also revealed that bacteria and dermatophytes were present. Therefore, more medicine was prescribed for 4 weeks to alleviate clinical signs. After six weeks of medication, clinical signs were alleviated (Fig 1) and skin screening test revealed no remarkable findings.

Discussion

*Leclercia Adecarboxylata*is isolated from normal flora in the gut of animals (12,15). It has been also isolated from the environmental sources (11).

The epidemiology of infection is not clear. The pathogenic

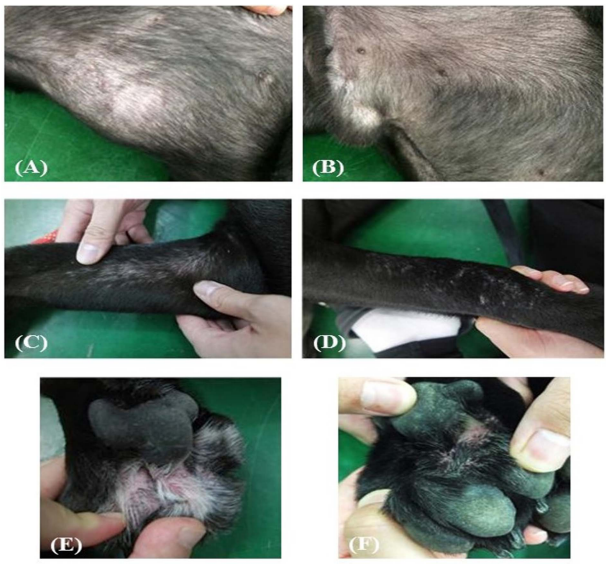

Fig 1. The clinical signs of the patient. Generalized erythema, pustule and pruritus were identified (A), (C), (E). Six weeks after treatment, clinical signs were alleviated (B), (D), (F).

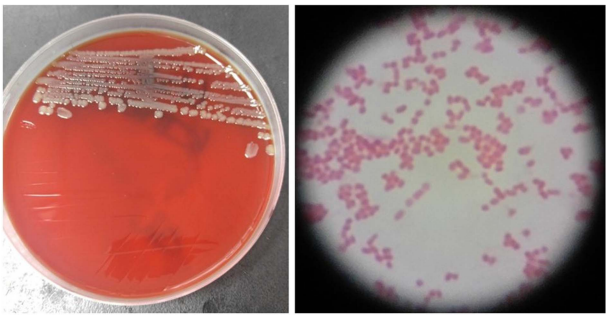

Fig 2. *Leclercia Adecarboxylata* identification by aerobic culture.

effects have been identified only in human medicine. As we mentioned before, only small number of clinical reports have been published, mostly affected patients were immunocompromised (3,9). In healthy patients who infected by *Leclercia Adecarboxylata*, the organism was presented as part of a post-traumatic poly-microbial infection (16). In human medicine, *Leclercia Adecarboxylata* has been generally sensitive to most antibiotics (15,16). In our study, *Leclercia Adecarboxylata* was sensitive to tetracyclines, aminoglycosides, B-lactams, quinolones, trimethoprim/sulfamethoxazole and chloramphenicol by aerobic culture and antibiotic susceptibility test. The *Leclercia Adecarboxylata* infection of the dog in this report was recovered by enrofloxacin prescription in substance.

Leclercia Adecarboxylata is an opportunistic pathogen, commonly seen in a mixed infection with other pathogens (2,4,6,8). In this case report, we also confirmed mixed infection of *Leclercia Adecarboxylata* with *Pseudomonas putida* by aerobic culture.

In veterinary medicine, only two isolations of *Leclercia Adecarboxylata* have been published. One isolation was performed in hen's eggs and the other was performed in healthy domestic pigs. Both *Leclercia Adecarboxylata* were isolated with other bacteria without any clinical signs (12,14). There is no report of clinical symptoms by *Leclercia Adecarboxylata* in veterinary medicine.

Defects in the skin barrier and an aberrant immune system can cause atopic dermatitis. Bacterial agents in the pathogenesis of canine atopic dermatitis play an important role (10). In addition, dermatophytosis occurs as high incidence in atopic dermatitis (7). Therefore, in canine atopic dermatitis, infections of bacteria and dermatophytes are commonly identified.

In this study, we could not perform the allergic test, but just performed skin screening test. Skin screening test revealed that there were no fleas but bacteria and dermatophytes were present. And aerobic culture of the bacteria revealed that *Leclercia Adecarboxylata* with *Pseudomonas putida* presented. With treatment for the bacteria and dermatophytes, the clinical signs were alleviated. However the clinical signs can be recur if this dog has atopic dermatitis.

The duration of the treatment in this study was 6 weeks. This duration is a little longer than it usually takes to alleviate clinical signs in superficial pyoderma. We could not prove that the infection of Leclercia Adecarboxylata needs longer treatment period or not. Further studies will be needed.

Bacterial and fungal skin infections are common in dogs with or without atopic dermatitis. However, there is no report of pathogenic *Leclercia Adecarboxylata* infection even in gastrointestinal tract in veterinary medicine. This is the first report of *Leclercia Adecarboxylata* infection in dogs. This report proved that *Leclercia Adecarboxylata* with mixed infection can cause skin problem in dogs.

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References

1. Anuradha M. Leclercia adecarboxylata isolation: case reports and review. J Clin Diagn Res 2014; 8: DD03-04.
2. Atas DB, Velioglu A, Asicioglu E, Arikan H, Tuglular S, Ozener C. Polymicrobial peritonitis with Leclercia adecarboxylata in a peritoneal dialysis patient. Saudi J Kidney Dis Transpl 2017; 28: 181-182.
3. Beltran A, Molinero AV, Capilla S, Polo AM. [Isolation of Leclercia adecarboxylata from wound exudate of a diabetic patient]. Med Clin (Barc) 2004; 122: 159.
4. Eiland EH, 3rd, Siddiqui H, Goode AM, Leeth SD. Pneumonia due to multidrug-resistant Leclercia adecarboxylata. Am J Health Syst Pharm 2013; 70: 940-941.
5. Hess B, Burchett A, Huntington MK. Leclercia adecarboxylata in an immunocompetent patient. J Med Microbiol 2008; 57: 896-898.
6. Hurley EH, Cohen E, Katarincic JA, Ohnmacht RK. Leclercia Adecarboxylata Infection in an Immunocompetent Child. R I Med J (2013) 2015; 98: 41-44.
7. Jones HE, Reinhardt JH, Rinaldi MG. A clinical, mycological, and immunological survey for dermatophytosis. Arch Dermatol 1973; 108: 61-65.
8. Jover-Saenz A, Cerezo-Esforzado E, Barcenilla-Gaite F,

Garrido-Calvo S, Porcel-Perez JM. Leclercia adecarboxylata cholecystitis in a patient with metabolic syndrome. Surg Infect (Larchmt) 2008; 9: 411-412.
9. Lee B, Sir JJ, Park SW, Kwak CH, Kim SM, Kim SB, Kwak YG, Whang DH, Cho WH, Choi SK. A case of Leclercia adecarboxylata endocarditis in a woman with endometrial cancer. Am J Med Sci 2009; 337: 146-147.
10. Ong PY, Leung DY. The infectious aspects of atopic dermatitis. Immunol Allergy Clin North Am 2010; 30: 309-321.
11. Sarma PM, Bhattacharya D, Krishnan S, Lal B. Degradation of polycyclic aromatic hydrocarbons by a newly discovered enteric bacterium, Leclercia adecarboxylata. Appl Environ Microbiol 2004; 70: 3163-3166.
12. Schierack P, Walk N, Reiter K, Weyrauch KD, Wieler LH. Composition of intestinal Enterobacteriaceae populations of healthy domestic pigs. Microbiol 2007; 153: 3830-3837.
13. Shah A, Nguyen J, Sullivan LM, Chikwava KR, Yan AC, Treat JR. Leclercia adecarboxylata cellulitis in a child with acute lymphoblastic leukemia. Pediatr Dermatol 2011; 28: 162-164.
14. Stepien-Pysniak D. Occurrence of gram-negative bacteria in hens' eggs depending on their source and storage conditions. Pol J Vet Sci 2010; 13: 507-513.
15. Stock I, Burak S, Wiedemann B. Natural antimicrobial susceptibility patterns and biochemical profiles of Leclercia adecarboxylata strains. Clin Microbiol Infect 2004; 10: 724-733.
16. Temesgen Z, Toal DR, Cockerill FR, 3rd. Leclercia adecarboxylata infections: case report and review. Clin Infect Dis 1997; 25: 79-81.