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Two cases of atypical periorificial dermatitis caused by *Candida parapsilosis* in patients volunteering in dog shelters

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Abstract

Candida is a genus of yeasts that can be a part of normal human skin flora, but may cause disease when the skin barrier is compromised. *C. albicans* is the most common pathogenic species of this genus, but in recent years infection with other species, such as *C. parapsilosis* has been growing. *C. parapsilosis* is a species of *Candida* that has been found in the skin of humans and other mammals, including dogs. In this brief report, the authors describe two cases of atypical periorificial infection with *C. parapsilosis* in patients who both volunteered in dog shelters. Owing to the atypical presentation of the fungal infections, the isolation of *C. parapsilosis* as the causative organism and their extensive history of exposure to dogs, these cases may represent the first evidence of possible zoonotic transmission of *C. parapsilosis* from dogs to humans.

Keywords: *Candida*, perioral dermatitis, zoonotic

Case Synopsis

Case 1: A woman in her twenties presented with unilateral well demarcated, erythematous annular plaques around the eyes (**Figure 1**). Exposure history was significant for volunteer work at a dog shelter. She was originally diagnosed with contact dermatitis and treated with topical corticosteroids. After negative patch testing to the ACDS 80 standard panel, a fungal culture was performed and demonstrated *Candida guilliermondii* and *Candida parapsilosis* complex. She was started on itraconazole and at three-month follow up the eruption had cleared completely.

Case 2: A woman in her eighties presented with bilateral erythematous excoriated scaling patches and plaques of skin. Exposure history was significant for volunteer work at a dog shelter. Initially she was diagnosed with contact dermatitis and given intramuscular and topical triamcinolone. On follow up three weeks later, she reported the itching was getting worse and she exhibited a wide moist perioral erythematous patch confluent with the vermillion (**Figure 2**). Her zinc and B vitamins were tested and found normal. One month later she returned to clinic with little improvement and fungal culture was taken, which grew *Candida parapsilosis*. She was given fluconazole, which resulted in complete clearance.

Case Discussion

It was long believed that *Malassezia pachydermatis* was the sole cause of canine dermatitis, with *Candida* playing little or no role [2]. Recent studies, however,



Figure 1. Periocular erythematous, annular plaques due to *Candida parapsilosis* infection.



Figure 2. Perioral erythematous plaques caused by *Candida parapsilosis* infection.

have shown evidence that not only are dogs frequently colonized with *Candida*, but that it can also be pathogenic [2]. A recent study examining both healthy dogs and those with seborrheic dermatitis found *Candida parapsilosis* to be a common organism. Of 34 isolates studied, 11/34 (32.4% from 17 healthy dogs) were associated with *C. parapsilosis*, whereas 14/32 (43.7%) isolates from 20 dogs with seborrheic dermatitis grew *C. parapsilosis* [2]. Of these 14 isolates that contained *C. parapsilosis*, 9 of the 14 did not have *Malassezia pachydermatis* present, suggesting that the *C. parapsilosis* alone may have been responsible for the seborrheic dermatitis. This study however, was carried out in Thailand, where the canine flora may be different owing to humidity and climate; this may not be representative of the prevalence of *C. parapsilosis* in the United States. A study examining the fungi present on healthy dogs in the United States found the prevalence of *C. parapsilosis* on healthy dogs to be around 2-3% [3]. This study however was limited by the fact it only had 10 animals and all the dogs were healthy. Therefore, the prevalence of *C. parapsilosis* on dogs with seborrheic dermatitis or other cutaneous infection in the United States remains unknown. As both these studies have their limitations, further study into the prevalence of cutaneous *C. parapsilosis* in dogs is warranted.

Zoonotic transmission of fungal organisms is well established, including clinically relevant relationships such as *Paracoccidioides* transmission from dogs, *Histoplasma capsulatum* transmission

from a variety of mammals, and *Cryptococcus* from pigeon droppings [4]. Classically, these transmissions all involve inhalation of spores. There is also evidence for dog-to-human zoonotic transmission of infection with *M. pachydermatis* [5]. The fact that, like *M. pachydermatis*, *C. parapsilosis* may be found on the skin of dogs, and both patients volunteer at dog shelters, makes canine-to-human transmission an interesting potential source of the pathogen in our patients [1, 2].

Susceptibility testing has been carried out to determine if *C. parapsilosis* susceptibility profiles differ significantly from that of *C. albicans*. They have shown a 97-98% susceptibility to amphotericin B, 96-98.5% for itraconazole, 93.3% susceptibility to fluconazole, and 98.1-100% susceptibility for voriconazole [1, 6]. Importantly, of the fluconazole-resistant isolates, only 36.7% were susceptible to voriconazole, suggesting cross-resistance across azoles [6].

Conclusion

These cases present an interesting association of resistant periorificial dermatitis, associated with possible canine to human transmission of *C. parapsilosis*. *Candida parapsilosis* may be simply a colonizer; however, both patients presented with topical and/or systemic corticosteroid resistance and cleared only after systemic antifungals. Further study is warranted on the impact of shared microbiome between humans and pets. Very limited research has been performed in this arena, although clinically-significant cases have been reported including an outbreak of *M. pachydermatis* at a Massachusetts hospital, originating from a pet dog of a nurse [5]. This case is an excellent example of One Health: the concept of interlocking the health of humans with animal and environmental effects. Greater collaboration between human and veterinary dermatologists are needed to better assess the impact of cutaneous microbiome and skin disease in pets with their owners.

Potential conflicts of interest

The authors declare no conflicts of interests.

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