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## Incidence of canine pododermatitis in dogs in Nagpur

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### Abstract

The present study was conducted at Veterinary Clinical Complex, Nagpur Veterinary College, Nagpur, from July 2022 to December 2022. The study involved 727 dermatological cases, of which 90 (12.37%) dogs had pododermatitis. Diagnostic testing on 61 dogs with pododermatitis revealed that 25 (40.93%) had bacterial dermatitis, followed by 14 (22.95%) with mixed bacterial and Malassezia infections, 7 (11.47%) with dermatophytosis, 6 (9.83%) with Malassezia pododermatitis, and 4 (6.55%) with hookworm dermatitis and pododemodicosis each. One case (1.63%) had mixed Malassezia and demodex infection. The most common clinical signs of pododermatitis observed were erythema in 55 dogs (61.11%), licking in 48 dogs (53.33%), and maximally present in all four paws (58.89%). The majority (42.22%) of pododermatitis cases in dogs were between the ages of 1-3. Comparatively speaking, male dogs (63.3%) suffered more than female dogs (36.7%). The Labrador breed had the highest incidence (35.58%), followed by breeds like Non-Descript (23.35%), German Shepherd, and Pug (6.66%). The plantar surface of the pastern (75.55%) and interdigital space (55.55%) of the foot were the two areas where skin lesions were most frequently localized.

**Keywords:** Pododermatitis, dog, incidence, Nagpur

### 1. Introduction

Inflammation of the interdigital skin is known as pododermatitis. It is a relatively common skin condition in dogs that can affect one or more of their feet (Bajwa, 2016)<sup>[1]</sup>. The condition, also known as pedal folliculitis and furunculosis is complicated, multifaceted, and may be challenging to identify and manage (Miller *et al.*, 2013)<sup>[19]</sup>.

Infections of the paw can be excruciating, leading to limping and reluctance to place weight on the affected limb. The affected tissues include interdigital spaces, footpads, and nail folds. The front feet are more susceptible than the back feet to a wide range and intensity of damage (Besancon *et al.*, 2004; Kovacs *et al.*, 2005; Duclos *et al.*, 2008 and Miller *et al.*, 2013)<sup>[2, 13, 6, 19]</sup>. There are many causes of pododermatitis infectious, parasitic, immunologic, metabolic, genetic, neoplastic, foreign body, and progression to trauma/secondary infection (Duclos, 2013)<sup>[7]</sup>, so it is essential to evaluate each patient presented with pododermatitis.

Diffuse erythema and skin thickening, particularly in the ventral palmoplantar and dorsal interdigital regions, are clinical signs of pododermatitis. The digital and metacarpal/metatarsal surface or deeper layers may be affected less frequently. There could be one or more feet involved. Many dogs have primarily foot-related lesions, even though pododermatitis may be one aspect or expression of a more extensive dermatological condition (Ihrke *et al.*, 1985; Elkins and Berkenblit, 1990)<sup>[10, 8]</sup>. The incidence of pododermatitis in dogs was examined in the current study in dogs living in Nagpur city, including incidence in various breeds, ages, sexes, aetiologies, as well as the number of affected paws, the location of skin lesions and symptoms in the affected dogs.

### 2. Materials and Methods

All dogs presented were screened for pododermatitis from July 2022 to December 2022. After taking a detailed history of animals regarding sex, age, breed, location of lesions, and initial symptoms, various parameters like rectal temperature, body condition, and colour of the visible mucous membrane were recorded. The paws were thoroughly examined for erythema, hyperpigmentation, swelling, bleeding, pus discharge, alopecia, ulceration, lichenification, erosions, plaques, nodules, pustules, and footpads for the presence of hyperkeratinization, ulceration, etc. History regarding the vaccination schedule, deworming, ectoparasite control, and dietary change was also recorded.

The incidence of pododermatitis in dogs was calculated amongst the total number of dermatological cases screened. The incidence was further analyzed in relation to age, sex, breed, etiologies, number of paws affected, location of skin lesions, and symptoms.

### 3. Results and Discussion

During the study period, 727 dogs presented for treatment, of which ninety (12.37%) were found positive for pododermatitis. This was similar to the findings of Chhabra *et al.* (2020) [5], who reported that pododermatitis occurred at a rate of 12.89 percent among all dermatological cases that were screened. The maximum incidence rate of pododermatitis was recorded in 57 males (63.3%) than in 33 female dogs (36.7%) (Table 1). Similarly, Chhabra *et al.* (2020) [5] reported a higher occurrence of pododermatitis in male dogs (71.71%). Kshama (2013) [14], Sarma *et al.* (2013) [21], Khurana *et al.* (2016) [12], and Katariya *et al.* (2018) [11] also reported that male dogs were more prone to have dermatological conditions than female dogs. This might be brought on by male dog's tendency to roam during seasonal breeding, coming into contact with sick animals, and male dog's tendency to fight (Lashkar *et al.*, 2005) [16] and hormonal influence. Due to their more masculine appearance, greater vigour, and lack of unintended pregnancies, residents prefer male dogs over female dogs. This observation should be taken into consideration while analyzing sex susceptibility (Kumar *et al.*, 2006) [15].

**Table 1:** Sex wise incidence of Pododermatitis in dogs

Sex	No. of Pododermatitis affected dogs	Incidence (Percent)
Male	57	63.3
Female	33	36.7
Total	90	100

In the present investigation, pododermatitis mainly affected the age group of 1-3 years (42.22%), followed by 3-6 years (32.22%) and dogs older than six years (17.78%). The under-one-year-old age group was shown to be the least affected (7.78%) (Table 2). These findings were similar to those of Chhabra *et al.* (2020) [5], who reported the highest occurrence of pododermatitis in dogs 1-3 years of age (34.34%). Similarly, Shyma and Vijayakumar (2011) [23] reported the highest rate of skin problems in dogs between the ages of one to three (42.85%). Kumar *et al.* (2006) [15] also noted that dogs with skin issues were most likely to be between one and three years old. Infection in young dogs may be caused by inadequate epithelial development and a lack of specialized immunity (Hay, 1992) [9]. High body temperatures, high nutritional demands, and overcrowding may also increase young animal's vulnerability to bacterial infection (Scott *et al.*, 1995) [22].

**Table 2:** Age wise incidence of pododermatitis in dogs

Age	No. of Pododermatitis affected dogs	Incidence Percentage
<1yr	7	7.78
1-3yrs	38	42.22
3-6yrs	29	32.22
>6yrs	16	17.78
Total	90	100

The current investigation's findings showed that Labrador (35.58%) was the most commonly affected breed with

pododermatitis, followed by Non-Descript (23.35%), German Shepherd (6.66%), and Pug (6.66%). Other breeds of dogs like Golden Retriever, Pomeranian, Beagle, and Rottweiler breeds showed an occurrence of 5.55% each. Breeds like Doberman showed an occurrence of 3.33%. Saint Bernard and American bully showed a lower occurrence of 1.11% (Table 3). The results of the present investigation hold a partial similarity with Chhabra *et al.* (2020) [5], who reported the highest prevalence of pododermatitis in the Labrador breed (30.30%) followed by Pug (18.18%) and Beagle breeds (13.13%). This study's findings concur with those of Besancon *et al.* (2004) [2], who claimed that Labradors were more prone to paw infections than Greyhound dogs because of their wider-based paws and more expansive spaces between the pads. The breed composition of the canine population in a specific region and the popularity of individual breeds affect the breed's susceptibility to dermatological issues (Pocta and Svoboda, 2007) [20].

**Table 3:** Breed wise incidence of pododermatitis in dogs

Breeds	Cases of Pododermatitis	Percent incidence
Labrador	32	35.58
Non-Descript	21	23.35
German Shepherd	6	6.66
Pug	6	6.66
Pomeranian	5	5.55
Golden retriever	5	5.55
Beagle	5	5.55
Rottweiler	5	5.55
Doberman	3	3.33
Saint Bernard	1	1.11
American Bully	1	1.11
Total	90	100

Sixty-one dogs with pododermatitis were selected for this study. It was discovered that bacterial pododermatitis occurred most frequently, with 25 cases (40.93%), followed by 14 instances (22.95%) of mixed infection with bacteria and Malassezia, and seven instances (11.47%) of dermatophytosis. Malassezia pododermatitis was to be identified in six instances (9.83%), followed by hookworm dermatitis and pododemodocosis in four cases (6.55%) each. A mixed infection with Malassezia and Demodex was found in one case (1.63%) (Table 4). This study was in accordance with Chhabra *et al.* (2020) [5], who reported the highest occurrence of bacterial dermatitis in 24 (48%) dogs, followed by 14 (28%) positive for atopic dermatitis, 6 (12%) positive for demodicosis, 3 (6%) positive for dermatophytosis, 2 (4%) positive for a mixed infection and one (2%) suffered from superficial necrolytic dermatitis out of 50 dogs suffering from pododermatitis. Region-specific variations in the prevalence of skin problems are related to geo-climatic factors (Khurana *et al.*, 2016) [12].

**Table 4:** Incidence of different etiologies of pododermatitis in dogs

Etiology	Cases	Percentage
Bacterial	25	40.93
Mixed infection (Bacteria and Malassezia)	14	22.95
Dermatophytosis	7	11.47
Malassezia	6	9.83
Ancylostoma	4	6.55
Pododemodocosis	4	6.55
Mixed infection (Demodex and Malassezia)	1	1.63

In the present study, it was recorded that all four paws (58.89%) were more commonly affected with pododermatitis, followed by two paws (22.22%) and one paw (15.56%), and three paws were least affected (3.33%) (Table 5). The findings of the present investigation were in accordance with Chhabra *et al.* (2020) [5], who reported that all four paws (61.61%) had the most pododermatitis lesions, followed by two paws (28.28%), and one paw (10.10%) had the least number of lesions. This was also in accordance with Breathnach *et al.* (2008) [4], who noted that 18/20 cases of pododermatitis had lesions on all four paws. According to Ural *et al.* (2012) [25], all four feet were affected in three out of seven cases of hookworm dermatitis in German Shepherd dogs. They also suggested that poor limb or foot conformation may have contributed to the uneven weight distribution on the feet, which caused the weight to be distributed partially on the haired skin between the footpads rather than entirely on the footpads. On the top of the paws, abscesses appeared in the space between the footpads because hair shafts were forced back into the skin, causing profound skin irritation, infection, and abscesses.

**Table 5:** Number of affected paws and percent incidence in dogs suffering from pododermatitis

Number of paws affected	No of cases	% Incidence
Two paws	20	22.22
All four paws	53	58.89
Only one paw	14	15.56
Three paws	3	3.33
Total	90	100

The current investigation discovered that the interdigital space (55.55%) was where the inflammation was most concentrated, followed by the plantar surface of the pastern (75.55%). About 43.33% of the cases of inflammation were in the fingers and pastern tissues. The dorsal side of the pastern (12.22%) and the phalanges of the fingers (31.11%) both had relatively less infection (Table 6). Breathnach *et al.* (2005) [3] reported the presence of lesions on both the dorsal and palmoplantar skin surfaces in all pododermatitis cases. They observed regions bordering the paw pads were seen in 15/20 cases. He opined that clinical signs in each case fluctuated in line with the dynamic nature of the chronic inflammatory disorder.

Clinical examination of 90 dogs with pododermatitis revealed symptoms of licking in 48 dogs (53.33%), erythema in 55 dogs (61.11%), alopecic patches in 15 dogs (16.66%), hyperkeratinisation or hyperpigmentation in 7 dogs (7.77%), crusted/fissured footpads in 6 dogs (6.66%), papules/ pustules in 8 dogs (8.88%), ulcers/erosions in 3 dogs (3.33%), discharge of exudates in 7 dogs (7.77%), inter digital nodules in 2 dogs (2.22%), vesicle in 1 dog (1.11%), swelling of paws in 7 dogs (7.77%), bleeding in 10 dogs (11.11%), limping in 11 dogs (12.22%) and reluctance to walk in 7 dogs (7.77%) (Table 7) which was pretty consistent with the conclusions of Chhabra *et al.* (2020) [5] who also reported clinical signs of dogs suffering from pododermatitis to be licking (69.69%) and erythema (29.29%) followed by papules/ pustules in six (6) dogs (6.06%), hyperkeratinisation or hyperpigmentation, reluctance to walk and bleeding in five (5) dogs (5.05%), crusts, nodules and ulcerations in three (3) dogs (3.03%), alopecia in two (2) dogs (2.02%) and vesicles in one (1) dog (1.01%). According to Swaim *et al.* (1991) [24], pododermatitis

also has alopecia, hyperpigmentation, pyoderma, and sinus tracts with serosanguinous or seropurulent discharges. This ailment was more likely to develop in situations where the dog was likely to lick its feet excessively. The skin may macerate, soften, and degrade when there is friction and moisture. These symptoms were caused by bacterial growth on the skin, which led to the release of toxins and enzymes that led to inflammation and pruritus (Leib and Monroe, 1997 and Loeffler *et al.*, 2011) [17].

**Table 6:** Incidence of localization of skin lesions in pododermatitis affected dogs

Localisation of inflammation	No of Cases	Percentage
In the interdigital space	50	55.55
On the plantar surface of the pastern	68	75.55
Inflammation limited only to the phalanges of the fingers	28	31.11
On the dorsal side of the pastern	11	12.22
Inflammation in which more tissues of the pastern and fingers are affected	39	43.33

**Table 7:** Symptomatology in pododermatitis of dogs

Clinical Signs	No of cases	Percentage
Licking/Itching	48	53.33
Erythema	55	61.11
Alopecia and patches	15	16.66
Hyperkeratosis/Hyperpigmentation	7	7.77
Crustation/Fissured paw pads	6	6.66
Pustules/papules	8	8.88
Ulcers/Erosions	3	3.33
Discharge of exudates	7	7.77
Interdigital nodules	2	2.22
Vesicle	1	1.11
Swelling of paws	7	7.77
Bleeding	10	11.11
Limping	11	12.22
Reluctance to walk	7	7.77

## Conclusion

The incidence of pododermatitis at the VCC from July 2022 to December 2022 was 12.37 percent. More male dogs (63.3%) than female dogs (36.7%) had pododermatitis. Dogs between the ages of 1-3 (42.22%) years had the highest incidence of pododermatitis. The breed that was most frequently affected (35.58%) was the Labrador Retriever. Bacterial infection was the most prevalent cause of pododermatitis.

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