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Research Article

HOSPITAL OCCURRENCE OF CANINE DERMATOLOGICAL DISORDERS AND RELATED LESIONS IN AND AROUND PALAM VALLEY OF HIMACHAL PRADESH

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ABSTRACT

The present study was conducted to know the hospital occurrence, and nature of lesions in various skin affections seen in dogs in and around the Palam valley of Himachal Pradesh. Dogs suffering from various dermatological conditions were presented at the Department of Veterinary Medicine, DGCN College of Veterinary and Animal Sciences, CSK Himachal Pradesh Krishi Vishwavidyalaya, Palampur (H.P.) The dogs were screened for various skin affections using point-of-care diagnostic techniques such as superficial and deep skin scrapings, cytology of impression smears, as well as biopsy and were considered for the following study. A total of 2,671 canine cases w.e.f. February 2021 to April 2022 were presented, out of which 227 (8.40%) canines were diagnosed with different dermatological disorders. Bacterial dermatitis 78 (34.00%) was the most common diagnosed skin condition which showed *Staphylococcus* spp. as the most dominant bacterial infection. Demodicosis, fungal origin, flea infestation, and sarcoptic mange were other dermatological affections observed in this study. Another role was played by climate in ascertaining these maladies, a greater number of cases of dermatitis were reported during the monsoon season (46.69%). Specific breeds such as mongrel dogs (34.36%) showed higher susceptibility to skin afflictions, and it was noticed that sex of the species was significant too; males (75.33%) were found to be increasingly prone than females (24.66%), but this could also be due to an over presentation of male dogs. Most canines with differing dermatological disorders had pruritis (80.62%), followed by alopecia (75.33%) and erythema were all found as associated lesions. In the situation at present, skin problems in dogs are amongst the most prevalent disorders seen in veterinary hospitals. Therefore, it is required that definite strategies are established and further implemented in the controlling of canine dermatological disorders in the proposed study area.

Keywords: Alopecia, Atopic, Dermatitis, Dogs, Pruritis

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Dermatitis is a condition that is very burdensome for dog owners to cope with as the causes can seldom be appreciated. This disease can pave the way for subsequent infections that can cause further complications and distress to the animals. Typically, canine dermatitis does not pose a life-threatening concern, although it can be quite intolerable. Treatment and control of the issue is still necessary to give the dog a happy, itch-free and a high quality of life. Skin disorders in dogs range from acute self-limiting ailments to chronic or long-term affairs that require lifelong treatment. Cold, heat, light, sunshine, and humidity are all climatic factors that influence the prevalence of skin diseases (Handa *et al.*, 2001). Even though skin lesions are easily seen and can be closely examined, dermatology is still a challenging field of veterinary medicine. In the present scenario due to an increase in the pet population, global warming, additional ectoparasitic infestations etc. canine dermatologic problems are amongst the most frequently seen disorders in veterinary hospitals. No detailed research has been conducted in the past twenty years on canine dermatologic conditions in and around the Palam valley of Himachal Pradesh. To develop a strong comprehensive understanding of the situation in this scenario, the current research was conducted in which the prevalence and lesion distribution in various canine dermatological conditions was presented at the Veterinary Hospital of the College of Veterinary and Animal Sciences, Palampur.

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MATERIALS AND METHODS

A total of 2,671 dogs of different ages, sex, and breeds were presented at the Veterinary Hospital Small Animal Medicine OPD of DGCN, College of Veterinary and Animal Sciences, CSK Himachal Pradesh Krishi Vishwa Vidyalaya, Palampur (H.P.) over a period of 14 months w.e.f. February 2021 and April 2022. Dogs presented with dermatological conditions were screened for various skin affections using point-of-care diagnostic techniques such as wood's lamp, acetate tape techniques, cytology of impression smears, superficial and deep skin scrapings as well as biopsy. Dogs suffering from dermatitis displayed varying nature of lesions including pruritus, alopecia, crusts, pustules, papules, macules, scales, erythema, alopecia, abscesses, ulcers, erosions, lichenification. Depending on the history and clinical appearance of the lesions, superficial or deep skin scrapings were taken using the techniques outlined by Soulsby (2012). Cytological samples (tape stripes, impressions from the moist surface lesions, PBS-dipped wet swabs from the dry lesions, and aspirates from the papules, pustules, and nodules) were stained (Giemsa), dried, and examined microscopically.

Woods lamp examination was performed using a handheld woods lamp which was switched on ten minutes prior to the examination of the lesion. The lesion was first examined under white light followed by UV light in a dark room for any fluorescence under the UV light (Curtis, 2001). In the case of unresponsive chronic recurrent dermatitis, bacterial culture examination and in vitro antibiotics sensitivity patterns of the microorganisms was performed (Bauer *et al.*, 1966).

RESULTS AND DISCUSSION

Out of the total 2671 dogs cases presented, 227 dogs were diagnosed with different dermatological disorders indicating an 8.40% overall hospital prevalence. Considering an etiological occurrence, bacterial dermatitis (Fig. 3a-c) included 78 (34.00%) of the 227 dogs which was the most common dermatological disorder followed by demodectic mange 41 (18.00%) (Fig. 1a-c), fungal origin 40 (17.62%) (Fig. 2a-c), flea infestation 38 (16%) (Fig. 4a-c), sarcoptic mange 8 (3.52%) (Fig. 5a-c), atopic dermatitis, cheyletiellosis (Fig. 6) and nutritional deficiency was 6 (2.6%) and pemphigus was 4 (1.7%). Fig.-A showed most common canine dermatological disorders reported in Palam Valley of Himachal Pradesh. Various researchers in different states of India and abroad have studied the frequency of canine dermatological disorders, Ananda and Adeppa (2017) in Shimoga reported highest prevalence of fleas (38%), Khurana *et al.* (2016) in Haryana reported mange as maximum and Khoshnegah *et al.* (2013) in Iran reported superficial bacterial folliculitis 57 (18.03%) as a predominant skin problem in dogs. These findings were not totally in accordance with our study which could be because of a variety of reasons including but not limited to the differences in management practices, environmental or geographic variations between the study areas.

The most common bacteria that was isolated in cases of chronic dermatitis was *Staphylococcus* spp. followed by *Pseudomonas* spp. which was similar tothe findings of Parvathy *et al.* (2022). *Staphylococcus intermedius* is believed to be a part of the normal and diseased dog's resident flora and can spread from these locations to other areas, such as hair shafts and infection locations (Muller, 2001). In this study amoxiclav was found to be the most sensitive drug (71.43%) followed by clindamycin and the least sensitive was ampicillin. These findings were in conjunction with the findings of Blunt *et al.* (2013).

The maximum number of cases were recorded during monsoon season (46.69%) followed by the winter season (22.46%) while the least number of cases were recorded during autumn (14.53%). In the summer skin affections were observed in 16.29% of cases. Khurana *et al.* (2016) reported maximum cases of dermatitis were recorded during the rainy season (30.02%) followed by the summer season (24.24%). A positive association between several skin conditions and monthly ambient temperature was observed. This could occur because of the hot, humid weather, which keeps animals wet for a long time, favouring the growth of parasites, and hastening the development of skin problems (Kamboj, 1991). In our study, the maximum recorded bacterial, fungal, flea, *Cheyletiella* and pemphigus dermatitis cases were in the monsoon season i.e., 46.15, 60.00, 65.78, 66.66 and 50.00%, respectively. Similarly, Gupta *et al.* (2000) found that prevalence of mycotic dermatoses peaked in July (23.66%) and August (15.38%), higher relative humidity and *Microsporum canis* exhibits a strong positive correlation and might be the reason for the higher fungal infections in monsoon season. Also bacterial, fungal and flea allergic dermatitis was most prevalent in this season which suggested that high humid conditions helped in accelerating the growth of the microorganism. *Demodex* spp. was recorded maximum in the winter season i.e., 41.46% followed by summer (29.26%) and the least in the autumn season (4.87%). This conclusion is comparable to that made by Lahkar *et al.* (2005), who found that the incidence of *Demodex canis* was higher (20.69%) during the post-monsoon season, especially in the month of November. During winter, the low humidity causes the skin to crack, allowing the offending agents to enter the breached integument. Furthermore, due to the cold weather in December, most dogs tend to stay indoors and huddle together to combat the effects of the cold environment. Sarcoptic mange and nutritional dermatitis were found to be the maximum recorded in summer i.e., 37.50% and 66.66%, respectively.

The maximum cases of dermatitis were found in males (75.33%) rather than females (24.66%) which could be due to an over presentation of male dogs by the owners. The current study conducted in and around Palampur area of Himachal Pradesh indicated that overall skin affections were more in the Mongrel breed (34.36%) followed by German shepherd (13.22%), Labrador (9.69%) and Pitbull (9.69%),which is in accordance to the findings of Singh et al. (2012) who reported mongrels (67.52%) and German shepherd (9.20%) were the most affected breeds, followed by Labradors (6.51%). According to breed-specific propensity data, bacterial, demodectic mange, flea, sarcoptic mange, cheyletiellosis, and nutritional were more common in mongrel breeds of dog (35.90%, 36.59%, 42.11%, 50%, 50%, and 66.67%, respectively). The prevalence of fungal dermatitis was more in German shepherds (22.50%). Atopic dermatitis was more prevalent in Labrador (33.33%). Pemphigus was most prevalent in German

Fig. A. Various canine dermatological disorders reported in Palam Valley

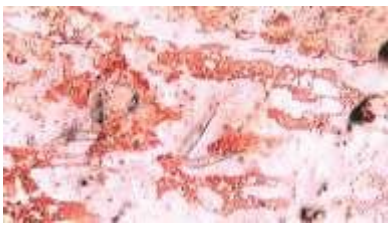
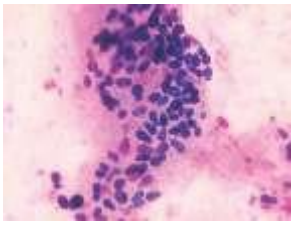
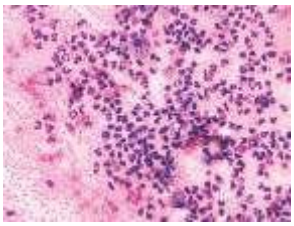
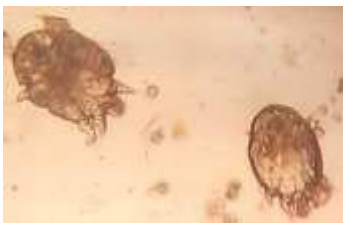
Cause	Condition	Post treatment Improvement
		
1a. Demodex (10x) in skin scrapping	1b. Demodicosis in 11-month-old Pitbull	1c.
		
2a. Basophilic unicellular yeast like organisms on impression smear of skin (Giemsa stain 100x)	2b. Fungal dermatitis in a 4-year-old Pug	2c.
		
3a. Bacterial colonies alongwith neutrophils & lymphocytic infilteration (Giemsa stain 100x)	3b. Bacterial dermatitis in a 1-year-old Shitzu	3c.
		
4a. Hair coat brushing for flea detection	4b. Flea allergy dermatitis in a 2-year-old German Shepherd	4c.
		
5a. Sarcoptes mite (10x) in skin scrapping	5b. Canine Scabies	5c. Pinna pedal reflex in Scabies
		
6. Walking dandruff/Cheyletiellosis in a 1.5 -year-old pug		

Table 1. Nature of lesion in various dermatological disorders

Lesions	Total n=227	Bacterial n=78	Demodectic n=41	Fungal n=40	Flea n=38	Sarcoptic n=8	Atopic n=6	Cheyletiella n=6	Nutritional n=6	Pemphigus n=4
Pruritis	183(80.62)	59(75.64)	39(95.12)	30(75)	35(92.11)	8(100)	5(83.33)	3(50)	1(16.67)	3(75)
Macula	4(1.76)	1(1.28)	0(0.00)	3(7.50)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)
Papule	52(22.91)	40(51.28)	0(0.00)	5(12.50)	0(0.00)	1(12.50)	3(50.00)	0(0.00)	1(16.67)	2(50)
Pustule	45(19.82)	44(56.41)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(16.67)	0(0.00)	0(0.00)	0(0.00)
Scale	81(35.68)	11(14.10)	7(17.07)	24(60)	28(73.68)	3(37.50)	1(16.67)	6(100.00)	1(16.67)	0(0.00)
Ulcer	5(2.20)	2(2.56)	0(0.00)	2(5.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(25)
Erosion	43(18.94)	15(19.23)	10(24.39)	1(2.50)	13(34.21)	2(25.00)	1(16.67)	0(0.00)	0(0.00)	1(25)
Crust	22(9.69)	5(6.41)	2(4.88)	6(15.00)	2(5.26)	7(87.50)	0(0.00)	0(0.00)	0(0.00)	0(0.00)
Erythema	148(65.20)	70(89.74)	37(90.24)	15(37.50)	15(39.47)	1(12.50)	4(66.67)	1(16.67)	1(16.67)	4(100)
Abscess	8(3.52)	8(10.26)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)
Alopecia	171(75.33)	69(88.46)	38(92.68)	25(62.50)	20(52.63)	7(87.50)	3(50.00)	3(50.00)	4(66.67)	2(50)
Lichenification	22(9.69)	2(2.56)	5(12.20)	10(25.00)	3(7.89)	0(0.00)	0(0.00)	0(0.00)	2(33.33)	0(0.00)

Figures in bracket indicated per cent affected.

shepherds, Labrador, Pitbulls, and Bull terriers (25% each). Similarly, Sharma *et al.* (2018) reported the highest prevalence of demodicosis in the Mongrel breed. The poor physical state of the mongrel may have altered the microenvironment of the skin, leaving it more vulnerable to mite growth. Chesler *et al.* (2010) reported mixed breed dogs (25.30%), German shepherd dogs (12.72%), and Spanish Cocker dogs (7.19%) had the highest incidences of demodicosis. The breeds predisposition to dermatological problems varied according to the breed composition of a specific region's canine population and the popularity of individual breeds (Pocta and Svoboda, 2007).

Nature of lesion in various dermatological disorders

The nature of lesions recorded in various dermatological disorders is given in Table 1. Pruritis, a manifestation of skin damage brought on by inflammatory agents, was the only major clinical symptom that appeared in all dermatoses (80.62%). Pruritis was caused by injury in all dermatological conditions, including bacterial, fungal, and ectoparasite infestation (Baker and Thomsett, 1990). The dermo-epithelial junction's pruritus receptors are stimulated by an ectoparasite infestation, which results in pruritus. In this investigation, all dermatotic animals displayed erythema, which may have been caused by an inflammatory response brought on by epidermal cell injury, exudates produced by infected mites or toxins released by bacteria that lead to increased peripheral blood circulation (Ettinger and Feldman, 2000). The main mediators of pruritus, however, are currently believed to be proteolytic enzymes. Other mediators, including histamine, serotonin, prostaglandins and peptides, and leukotrienes, are also thought to play a role in the development of pruritus in the affected dogs. Alopecia (75.33%) was second most common clinical sign reported in this study, Ettinger and Feldman (2000) found alopecia may arise from structural damage to the hair during growth, which can leave it brittle or damaged and cause it to break off, causing a range of alopecia from patchy to generalized. Hair loss may be brought on by parasitic infestation of the hair roots, inflammatory invasion of the root sheath, and disruption of the nutrition of the hair bulb, the atrophy of the hair follicles and sebaceous glands, the closure of follicular glands by mites could all be contributing factors.

In the case of bacterial dermatitis, the maximum number of dogs suffer from erythema, alopecia, pruritis, pustules and papules. According to Mason (1997), papules and pustules are the actual bacterial dermatitis lesions, but pustules are a clear indication of bacterial dermatitis, epidermal collarettes are the remains of pustules. Bacterial toxins function as super antigens and enhance the cutaneous and immune response in the area (Muller, 2001).

A range of lesions was seen in dogs with demodectic mange. The conventional and widespread lesions were pruritis, alopecia, erythema, erosions, scale, hyperpigmentation, and crust. These findings concur with those made by Reddy and Kumari (2010) and Sharma *et al.*, 2018. Alopecia may have been brought on by the irritation and inflammation that mites in the hair follicle generated (Muller, 2001). In the current investigation, dogs with fungal dermatitis displayed a wide range of clinical lesions and are similar to the findings of Scott *et al.* (2001) who also noted that fungal dermatitis is characterised by alopecia patches, scales, crusts, erythema, hyperpigmentation, and extreme pruritis. The signs shown in flea allergy dermatitis (FAD) were severe pruritus, erythema, excoriation, and alopecia, mostly affecting the dorso-lumbosacral region of the body and is similar to the findings of Noli and Beck's

(2007). Alopecia was observed in almost all cases of sarcoptic mange as a sequela of erythema. Scales and pruritis were a characteristic finding in sarcoptic mange. These were the result of increased keratin production and damaged dermis suffering from sarcoptic mange. This was consistent with the research of Gupta (2000). In atopic dermatitis lesions were pruritis, erythema, papule, alopecia, pustule, scale, and erosion. The significant lesions noticed in the present atopic dogs agreed with the findings of Olivry *et al.* (2007). Favrot *et al.* (2010) also recorded that 61% atopic dermatitis affected dogs showed pruritus which is the clear pathognomonic sign of atopic dermatitis; face rubbing, and foot licking were also observed in atopic dogs.

In conclusion, the canine dermatological disorders were most frequently presented and diagnosed in the Veterinary Hospital of DGCN, COVAS, CSK HPKV, Palampur. The stand alone characteristics included: skin affection mainly caused by bacterial dermatitis followed by demodicosis, mongrel and German Shepherd breeds were mostly affected, and maximum cases of dermatitis were recorded during monsoon season. Pruritis was one of the most predominant signs seen in dogs presented with various dermatological issues. There is a necessary requirement for diversified planning and development of procedures to control canine dermatological disorders in the study area with additional studies needed to apprehend the nature and resistance pattern of different causative agents against commonly available drugs.

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