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Incidence of Parasitic Dermatological Disorders in Dogs – A Detailed Epidemiological Study

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A B S T R A C T

A study was undertaken to determine the prevalence of different parasitic dermatological disorders in dogs during the period from January 2016 to December 2016. Out of 22,193 dog cases reported to the Small Animals Dermatology Unit, Madras Veterinary College Teaching Hospital, Chennai, 11,774 (32.56%) animals had different dermatological disorders. Parasitic skin diseases were the most common dermatological disorder with highest prevalence of 44.68% (5261/11774). Among the parasitic skin infestations, tick infestation showed highest prevalence (2015/5261 parasitic infestation cases; 38.30%) followed by demodicosis (1723/5261; 32.75%), scabies (1429/5261; 27.16%), pediculosis (77/5261; 0.46%) and ear mite infestation (17/5261; 0.32%), respectively. Parasitic skin infestation showed higher prevalence in summer (1499/5261; 28.49%) followed by monsoon season (1469/5261; 27.92%), post monsoon (1466/5261; 27.90%). The young dogs under less than one year showed highest prevalence (1879/5261 parasitic infestation cases) of parasitic infestation among all the age groups (35.76%). Long haired breed dogs had higher prevalence of parasitic skin diseases (2701/5261; 51.47%) than short haired breed dogs (2560/5261; 48.70%). Epidemiological analysis of the parasitic skin diseases data revealed an increasing awareness among dog owners about the health of their pets and the environment becoming more favorable for the various etiological agents of skin disorders.

Introduction

Skin is a largest organ, that guards the body against dehydration by preventing fluid loss protects from exposure to the weather. Dermatological problems are one of the most commonly reported by veterinarians in small animal medicine (Scott *et al.*, 2001). Pet owners always desire to have pets with healthy fur. Dogs are commonly infested with many ecto-parasites and bacterial infection which makes them miserable due to constant scratching and severe itching. Several studies from India and abroad have indicated that skin affections make up a significant proportion of the small animal caseload (Sarma *et al.*, 2013). The purpose of this study was to document the prevalence of different parasitic

dermatological disorders in dogs particularly in Chennai city, Tamil Nadu, India and to look for epidemiological factors associated with their occurrence.

Materials and Methods

The present study was carried out in the Small Animals Dermatology Unit, Madras Veterinary College Teaching Hospital, Chennai – 600 007 from the period of January 2016 to December 2016. Dogs presented to the Small Animals Dermatology Unit with clinical signs suggestive of dermatological problem were included in the study. During the visit, information such as history, clinical signs, age, sex etc. were recorded. The data so collected was analysed to determine epidemiological pattern of various skin disorders in dogs. Skin scrapings from the dogs suspected for mite infestation were collected and examined by the method of Souls by (1982). Deep scrapings were taken from the peripheral areas of active lesions.

Results and Discussion

Prevalence

The results of the prevalence studies of the dermatological disorders of dogs during 2016 are presented in Table 1 and 2. Total number of dogs referred to Madras Veterinary College Teaching Hospital, Small animals outpatient ward (Medicine) and dermatology units was 36,161. Out of these, 11,774 (32.56%) dogs were affected with dermatological disorders.

The highest prevalence of skin diseases was recorded in June 2016 (45.83%) and lowest was recorded during February 2016 (24.56%), respectively. Prevalence of skin disorders ranging from 15-25% in dogs had been earlier reported (Hill *et al.,* 2006). Increasing trend of dermatological disorders observed in this study may probably be due to updated knowledge in diagnosis of skin diseases, increasing population of pets, increased awareness among pet owners or due to change in climate conditions.

Among dermatological problems in dogs, parasitic infestation showed higher prevalence (44.68%), followed by allergic skin diseases (32.46%), nutritional, physiological and hormonal disorders (10.85%), fungal skin diseases (6.85%), bacterial skin diseases (4.33%) and miscellaneous skin diseases (0.72%). Autoimmune diseases were the least (0.11%) in occurrence (Table 2).

Incidence of parasitic dermatological disorders in dogs

The results of the prevalence studies (Jan 2016 – Dec 2016) of the parasitic dermatological disorders of dogs are presented in Tables 3, 4 and 5. The prevalence of parasitic skin diseases among skin disorder was 44.68% (5261/11774).

It occupies 14.54% in total SAC medicine cases (5261/36161). Among the parasitic skin infestations, tick infestation showed highest prevalence (2015/5261 parasitic infestation cases; 38.30%) followed by demodicosis (1723/5261; 32.75%), scabies (1429/5261; 27.16%), pediculosis (77/5261; 0.46%) and ear mite infestation (17/5261; 0.32%), respectively.

The prevalence among the total skin disorders of the above said diseases are tick infestation 0.17%, demodicosis 0.15%, scabies 0.12% and others such as ear mite infestation and pediculosis are less than 0.01%. Kumar *et al.,* (2006) recorded ticks infestation as a major dermatological problem followed by sarcoptic mange and lice infestation in dogs. The prevalence of skin disorders appears to be region specific and dependent upon geo-climatic conditions.

Age

Age and sex-wise cases of parasitic skin diseases in dogs were presented in Table 3. The young dogs under less than one year showed highest prevalence (1879/5261 parasitic infestation cases) of parasitic infestation among all the age groups (35.76%) followed by 1 – 2 years age group (28.50%), 2 – 4 years age group (18.40%) and more than six years age group (10.10%). The least prevalence of parasitic skin diseases was observed in 4 –6 years age groups (7.30%). Less than one year age group showed highest prevalence of demodicosis (781/1723; 45.32%) and pediculosis (42/77; 54.55%). More than six years of age group showed highest prevalence in scabies (167/1429; 11.7%), lowest prevalence in demodicosis (120/1723; 7.00%) and pediculosis (0.8%). Ear mite showed highest prevalence in less than one year age group.

Higher prevalence of pediculosis was observed in dogs less than one year old (42/87; 48%).

This could be due to juvenile immune system which is unable to produce specific and sufficient antibodies to protect skin infection from different factors (Ardeth, 2002). In more than six years age group, the tick infestation was found to be always in higher prevalence (31.57%).

Sex

Male dogs showed higher prevalence of parasitic skin diseases (3216/5261; 61.13%). Male dogs had higher prevalence in all the parasitic diseases such as scabies (883/1429; 61.79%), demodicosis (1047/1723; 60.76%), tick infestation (1226/2015; 60.84%), ear mite infestation (10/17; 58.82%) and pediculosis (52/77; 67.53%).

Table.1 Total number of dermatological cases – Month wise

Month	No. of cases (SAC OP-M)	No. of cases (Dermatology Unit)	Total number of SAC-M cases	No. of dermatological cases (in %)
Jan-16	1969	804	2773	28.99%
Feb-16	2925	952	3877	24.56%
Mar-16	2346	1178	3524	33.43%
Apr-16	2501	1193	3694	32.30%
May-16	2199	1046	3245	32.23%
Jun-16	1098	929	2027	45.83%
Jul-16	1970	873	2843	30.71%
Aug-16	1831	795	2626	30.27%
Sep-16	1780	968	2748	35.23%
Oct-16	2081	1078	3159	34.12%
Nov-16	1897	999	2896	34.50%
Dec-16	1790	959	2749	34.89%
TOTAL	24387	11774	36161	32.56%

Table.2 Major skin disorders recorded in dogs			
Major skin disorders	**Number of cases**	**% within skin diseases**	**% among the total SAC OP M cases**
Parasitic diseases	5261	44.68%	14.55%
Bacterial diseases	510	4.33%	1.41%
Fungal diseases	806	6.85%	2.23%
Auto immune diseases	13	0.11%	0.04%
Allergic diseases	3822	32.46%	10.57%
Nutritional, physiological and hormonal disorders	1277	10.85%	3.53%
Others	85	0.72%	0.24%
Total	**11774**	**100.00%**	32.56%

Table.3 Age and sex-wise cases of parasitic skin diseases in dogs

		Scabies	**Demodicosis**	**Tick infestation**	**Ear mites**	**Pediculosis**	**Total**
Age-wise prevalence							
< 1 year	**No. of cases**	**450**	**781**	**601**	**6**	**42**	**1879**
	% within age gp.	23.9%	41.6%	32.0%	0.3%	2.2%	100.0%
	% within disease	31.4%	45.3%	29.8%	35.3%	54.5%	35.7%
1 -2 years	**No. of cases**	**429**	**404**	**642**	**7**	**17**	**1499**
	% within age gp.	28.6%	27.0%	42.8%	0.5%	1.1%	100.0%
	% within disease	30.0%	23.4%	31.9%	41.2%	22.1%	28.5%
2 - 4 years	**No. of cases**	**288**	**278**	**388**	**3**	**8**	**965**
	% within age gp.	29.8%	28.8%	40.2%	0.3%	.8%	100.0%
	% within disease	20.2%	16.1%	19.3%	17.6%	10.4%	18.3%
4 - 6 years	**No. of cases**	**95**	**120**	**163**	**0**	**6**	**384**
	% within age gp.	24.7%	31.3%	42.4%	0.0%	1.6%	100.0%
	% within disease	6.7%	7.0%	8.1%	0.0%	7.8%	7.3%
> 6 year	**No. of cases**	**167**	**140**	**221**	**1**	**4**	**533**
	% within age gp.	31.3%	26.3%	41.5%	0.2%	.8%	100.0%
	% within disease	11.7%	8.1%	11.0%	5.9%	5.2%	10.1%
	Total	**1429**	**1723**	**2015**	**17**	**77**	**5261**
Sex-wise prevalence							
Male	**No. of cases**	**883**	**1047**	**1226**	**10**	**52**	**3216**
	% within group	27.4%	32.5%	38.1%	0.3%	1.6%	100.0%
	% within disease	61.7%	60.7%	60.8%	58.8%	67.5%	61.1%
Female	**No. of cases**	**546**	**676**	**789**	**7**	**25**	**2043**
	% within group	26.7%	33.1%	38.6%	0.3%	1.2%	100.0%
	% within disease	38.2%	39.2%	39.2%	41.2%	32.5%	38.8%
	Total	**1429**	**1723**	**2015**	**17**	**77**	**5261**

Table.4 Breed and season-wise cases of parasitic skin diseases in dogs

		Scabies	Demodicosis	Tick infestation	Ear mites	Pediculosis	Total
Breed-wise prevalence							
Long haired	No. of cases	**825**	**767**	**1076**	**5**	**28**	**2701**
	% within group	30.5%	28.4%	39.8%	0.2%	1.0%	100.0%
	% within disease	57.7%	44.5%	53.4%	29.4%	36.4%	51.3%
Short haired	No. of cases	**604**	**956**	**939**	**12**	**49**	**2560**
	% within group	23.6%	37.3%	36.7%	0.5%	1.9%	100.0%
	% within disease	42.3%	55.5%	46.6%	70.6%	63.6%	48.7%
	Total	**1429**	**1723**	**2015**	**17**	**77**	**5261**
Season-wise prevalence							
Winter (Jan - Feb)	**No. of cases**	**203**	**374**	**228**	**5**	**17**	**827**
	% within group	24.5%	45.2%	27.6%	0.6%	2.1%	100.0%
	% within disease	14.2%	21.7%	11.3%	29.4%	22.1%	15.7%
Summer (Mar - May)	**No. of cases**	**440**	**478**	**558**	**0**	**23**	**1499**
	% within group	29.4%	31.9%	37.2%	0.0%	1.5%	100.0%
	% within disease	30.8%	27.7%	27.7%	0.0%	29.9%	28.5%
Monsoon (Jan - Sep)	**No. of cases**	**375**	**394**	**672**	**8**	**20**	**1469**
	% within group	25.5%	26.8%	45.7%	0.5%	1.4%	100.0%
	% within disease	26.2%	22.9%	33.3%	47.1%	26.0%	27.9%
Post Monsoon (Oct - Dec)	**No. of cases**	**411**	**477**	**557**	**4**	**17**	**1466**
	% within group	28.0%	32.5%	38.0%	0.3%	1.2%	100.0%
	% within disease	28.8%	27.7%	27.6%	23.5%	22.1%	27.9%
	Total	**1429**	**1723**	**2015**	**17**	**77**	**5261**

Table.5 Month-wise cases of parasitic skin diseases in dogs

		Scabies	Demodicosis	Tick infestation	Ear mites	Pediculosis	Total
Jan-16	**No. of cases**	**78**	**228**	**69**	**4**	**11**	**390**
	% within group	20.0%	58.5%	17.7%	1.0%	2.8%	100.0%
	% within month	5.5%	13.2%	3.4%	23.5%	14.3%	7.4%
Feb-16	**No. of cases**	**125**	**146**	**159**	**1**	**6**	**437**
	% within group	28.6%	33.4%	36.4%	.2%	1.4%	100.0%
	% within month	8.7%	8.5%	7.9%	5.9%	7.8%	8.3%
Mar-16	**No. of cases**	**146**	**151**	**200**	**0**	**7**	**504**
	% within group	29.0%	30.0%	39.7%	0.0%	1.4%	100.0%
	% within month	10.2%	8.8%	9.9%	0.0%	9.1%	9.6%
Apr-16	**No. of cases**	**181**	**149**	**218**	**0**	**12**	**560**
	% within group	32.3%	26.6%	38.9%	0.0%	2.1%	100.0%
	% within month	12.7%	8.6%	10.8%	0.0%	15.6%	10.6%
May-16	**No. of cases**	**113**	**178**	**140**	**0**	**4**	**435**
	% within group	26.0%	40.9%	32.2%	0.0%	.9%	100.0%
	% within month	7.9%	10.3%	6.9%	0.0%	5.2%	8.3%
Jun-16	**No. of cases**	**158**	**121**	**99**	**0**	**4**	**382**
	% within group	41.4%	31.7%	25.9%	0.0%	1.0%	100.0%
	% within month	11.1%	7.0%	4.9%	0.0%	5.2%	7.3%
Jul-16	**No. of cases**	**85**	**67**	**187**	**4**	**5**	**348**
	% within group	24.4%	19.3%	53.7%	1.1%	1.4%	100.0%
	% within month	5.9%	3.9%	9.3%	23.5%	6.5%	6.6%
Aug-16	**No. of cases**	**32**	**104**	**194**	**4**	**7**	**341**
	% within group	9.4%	30.5%	56.9%	1.2%	2.1%	100.0%
	% within month	2.2%	6.0%	9.6%	23.5%	9.1%	6.5%
Sep-16	**No. of cases**	**100**	**102**	**192**	**0**	**4**	**398**
	% within group	25.1%	25.6%	48.2%	0.0%	1.0%	100.0%
	% within month	7.0%	5.9%	9.5%	0.0%	5.2%	7.6%
Oct-16	**No. of cases**	**229**	**185**	**95**	**1**	**3**	**513**
	% within group	44.6%	36.1%	18.5%	.2%	.6%	100.0%
	% within month	16.0%	10.7%	4.7%	5.9%	3.9%	9.8%
Nov-16	**No. of cases**	**143**	**129**	**229**	**0**	**4**	**505**
	% within group	28.3%	25.5%	45.3%	0.0%	.8%	100.0%
	% within month	10.0%	7.5%	11.4%	0.0%	5.2%	9.6%
Dec-16	**No. of cases**	**39**	**163**	**233**	**3**	**10**	**448**
	% within group	8.7%	36.4%	52.0%	.7%	2.2%	100.0%
	% within month	2.7%	9.5%	11.6%	17.6%	13.0%	8.5%
	Total	**1429**	**1723**	**2015**	**17**	**77**	**5261**

This study revealed that there was no difference in skin diseases between males and females. This could be due to lack of sufficient specific antibodies to protect males from different parasitic agents. This was in accordance with Brilhante *et al.,* (2003). However, comparatively slight increase in prevalence of scabies and pediculosis in males and demodicosis and tick infestation was observed in females. Both sexes have the same ability to transmit genetic predisposition to demodicosis, scabies and fungal dermatitis (Morris *et al.,* 1936). This may be the reason for no sex predilection in skin disorders of dogs in our present study.

Breed

Breed and season-wise cases of parasitic skin diseases in dogswere presented in table 2. Long haired breed dogs had higher prevalence of parasitic skin diseases (2701/5261; 51.47%) than short haired breed dogs (2560/5261; 48.70%). Among parasitic diseases, scabies (825/1429; 57.73%), tick infestation (1076/2015; 53.40%) were highly prevalent in long haired breeds. Short haired breeds showed higher prevalence of demodicosis (956/1723; 55.48%), ear mites (12/17; 70.58%) and pediculosis (49/77; 63.63%). Higher prevalence of scabies, tick infestation, ear mites and pediculosis was observed in long haired breeds of dogs as compared to short haired breed, where exceptionally higher prevalence of demodicosis was observed.

Breed composition of canine population in a particular region and popularity of individual breeds can affect the results of breed predilection to dermatitis in the examined area (Pocta and Svoboda, 2007). However, Marsalla *et al.,* (2010) reported a higher prevalence of disease in long haired dogs like Spitz. It was concluded that the incidence of skin diseases depends on popularity of breeds and their population distribution in different geographical locations.

Season

Parasitic skin infestation showed higher prevalence in summer (1499/5261; 28.49%) followed by monsoon season (1469/5261; 27.92%), post monsoon (1466/5261; 27.90%). The least prevalence in observed during winter (827/5261; 15.71%). During winter, demodicosis showed higher prevalence (374/827; 45.22%) among other parasitic diseases. Tick infestation showed higher prevalence during summer (558/1499; 37.20%), monsoon (672/1469; 45.83%) and post monsoon (557/1466; 37.99%). Demodicosis was the most common dermatitis observed in winter season (45.1%) and the least occurrence was ear mites (0.6%). The highest prevalence during winter season might be due to hot and humid environment condition favouring the growth of mite and bacteria (Upadhyay *et al.,* 2005). In summer, monsoon and post monsoon seasons, the tick infestation found to be higher *viz.,* 37.2, 45.7 and 38.1%, respectively.

Month wise incidence

Month-wise number of cases of parasitic skin diseases in dogs was presented in Table 3. Parasitic skin infestation was higher during the month of April (560/5261; 10.64%) and lowest during the months of July (348/5261; 6.61%) and August (341/5261; 6.48%). Scabies, demodicosis, tick infestation, and pediculosis infestation were found to be higher in October, January, August, December and May months, respectively. Among all these infestation, ear mites was observed as lower prevalence in dogs. Different skin affections showed a positive correlation with monthly ambient temperature. In summer season, maximum cases were of tick infestation. Similar to the

observations of the present study, Dimri and Sharma (2004) reported maximum cases of skin diseases during hot and humid months of the year. The results revealed the dermatological disorders are prevalent in dog population in the Chennai city. Comprehensive planning and formulation of strategies for the control of skin affections in dog is presently needs attention. Further epidemiological analysis are required to understand the nature and resistance pattern of different causative agents and an increasing awareness among dog owners about the health of their pets or increasing pet population or the environment becoming more favourable for the various etiological agents of skin disorders.

References

Ardeth, B., 2002. Treatment of Mange, An explanation of the various types of mange in dogs and cats-- all caused by mites--their degree of seriousness, treatment, and prevention. Demandmedia Network.

Brilhante, R.S.N., C.S.P. Cavalcante, F.A. Soares-Junior, R.A. Cordeiro, J.J.C. Sidrim and M.F.G. Rocha, 2003. High rate of *Microsporum canis* feline and canine dermatophytoses in Northeast Brazil: Epidemiological and diagnostic features. *Mycopathologia*, 156: 303–308.

Dimri, U and Sharma, M.C. 2004. Effect of sarcoptic mange and its control with oil of *Cedrus deodara*, *Pongamia glabra*, *Jatropha curcas* and *Benzyl benzoate*, both with and without ascorbic acid on growing sheep: Epidemiology, assessment of clinical, hematological, cell mediated, humoral immune responses and pathology. *J. Vet. Med*. 51: 71-78.

Hill, P.B and D.J. DeBoer, 2001. The ACVD task force on canine atopic dermatitis (IV): environmental allergens. *Vet. Immunol. Immunopathol*. 81(3): 169-186.

Kumar, S., Khurana, R., Rakha, N.K and Khokhar, R.S. 2006. Epidemiological pattern of various skin disorders in dogs. *Indian J. Vet. Res*. 15 (1): 1-14.

Marsella, R., D. Samuelson and K. Doerr, 2010. Transmission electron microscopy studies in an experimental model of canine atopic dermatitis. *Vet. Dermatol*. 21(1): 81-88.

Morris, M.L., 1936. Demodex folliculorum canis. Its diagnosis and treatment. *J. Amer. Vet. Med. Assoc*. 88: 460-67.

Počta, S and M. Svoboda, 2007: Incidence of Canine Hypersensitivity in the Region of North Eastern Bohemia. *Acta Vet. Brno.*76: 451-459.

Sarma, K., Mondal, D.B., Sarvanan, M., Kumar, M and Vijaykumar, H. 2013. Incidence of dermatological disorders and its therapeutic management in canines. *Intas Polivet* 14: 186-192.

Scott, D. W., Miller, W. H. and Griffin, C. E 2001. Small Animal Dermatology. (6th edn.), W. B. Saunders, Philadelphia.

Upadhyay, A. K., Dwivedi, H. P., Singh, S., Kumar, M. and Kumar, S. 2005. Epidemiology of skin infections in dogs at Pantnagar. *Indian Vet. J*. 82: 763-764.

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