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RESEARCH ARTICLE

Prevalence of Mange Infestation in Canines of Kathmandu Valley

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ARTICLE INFO

ABSTRACT

Received: Aug	gust 31, 2012	A study on prevalence of mange infestation was conducted in canines of
Revised: Sept	tember 01, 2012	Kathmandu Valley. A total of 120 samples of suspected positive cases were
Accepted: Sept	tember 04, 2012	taken from the dogs for study. Out of total the samples collected, 60 were from
	<u> </u>	owned dogs (CVH- 30, Mount Everest Kennel Club- 22 and Veterinary Clinic-
Key words:		8) and 60 from stray dogs (KAT- 30 and Animal Nepal-30). The result showed
Mange, Owned dogs,		that 56% and 67% sample were positive for mites in owned and stray dogs
Prevalence, Stray Dogs		respectively. Out of total positive samples, 68% were Demodex and 32% were
		Sarcoptes in case of owned dogs. Likewise, 70% were Demodex species and
		30% were Sarcoptes species from the positive samples examined from stray
		dogs. Study on different breeds in case of owned dogs, Mongrel represents
		highest prevalence of mites 64%. Sex-wise prevalence showed the highest
		prevalence of mites in male representing 57%. Among different age groups, 3-6
		yrs age were found to be more affected with 65 % followed by 9-12 years with
*Corresponding	g Author	6 0%, 6-9 years with 57% and lastly 0-3 years with 45%. Similarly, the study
Yugal Raj Binda	indari	was also carried out among street dogs intespective of age and breed. Sex-wise
yugal_dipesh@y	ahoo.com	73%
		1570.

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INTRODUCTION

Skin is the largest organ of the body and may represent 12-24% of an animal's body weight. The skin and hair coat condition is used as an indicator of a dog's general health, as smooth and glossy hair reflects healthy skin. The skin has many functions, including serving as an enclosing barrier and providing environmental protection, regulating temperature, producing pigments and vitamin D and sensory perception (Aiello, 2000).

The incidence of skin diseases in domestic animals is high. Most of the skin diseases are contagious, therefore prompt and accurate diagnosis is of vital importance in their treatment and control. Skin diseases fall into two main categories, namely; parasitic and non-parasitic diseases. From the view of public health, parasitic diseases are important as a number of these diseases are transmissible to man (Boddie, 2000).

Brushing or grooming is a must for dogs because it gives the dog a sense of well being. Besides, it helps in cleanliness, removal of ectoparasites, stimulates the sebaceous glands to produce secretion, accustom the dog to regular handling and prevents various skin affections e.g. matting of hairs and dermatoses (Chakrabarti, 2006). Any laxity in the grooming and management of dogs often lead to serious ectoparasitic infestation like mites, ticks and lice. The dermatitis caused by ectoparasites is further exacerbated by bacterial and fungal infections if left uncared and under the unhygienic conditions. Mange is the most serious of all ectoparasities (Sharma, 2006).

Mange is a non-descript term used to imply a condition caused by mites on or near the skin surface (Dan, 2007). Mites cause severe irritation with symptoms of inflammation, itching and hair loss. Mites cause damage by tunneling into the skin via hair follicles and oil glands of the epidermal layer. Once the dog begins scratching the purities, soreness and redness begin to develop leading to crusty skin and scabs (Kaliseh, 2007).

METHODOLOGY

Sites of study

- 1. Central veterinary Hospital (CVH), Tripureswor
- 2. Kathmandu Animal Treatment Center (KAT), Chapaligaun
- 3. Animal-Nepal, Chauvar
- 4. Mount Everest Kennel Club, Old Banehwor
- 5. Vet. Clinic, Pulchok, Krishnagalli

Study population

Study was carried out from 120 dogs selected randomly having dermatitis, hair loss, dandruff, sneezing, itching, scratching, crusting, different patches on the body and ear wax etc. 60 samples were collected from CVH, Veterinary Clinic and Mount Everest Kennel Club whereas 60 samples from KAT and Animal-Nepal.

Division of samples

Samples were divided into 2 groups; Samples collected from CVH, HICAST, Veterinary Clinic and Mount Everest Kennel Club were regarded as samples from owned dogs and samples from KAT and Animal-Nepal were regarded as samples from stray dogs.

Sample size

A total of 120 samples (skin scrapping-95, nasal swab-10, and ear canker-15) were collected on random basis.

Samples collection

Samples were collected in plastic bag from the infected animals. Those samples were examined in laboratory for mites.

Sites of examination

Samples were examined at Vet. Clinic, Pulchok, Krishnagalli and Himalayan College of Agriculture Science and Technology (HICAST) as per convenience.

Criteria for animal selection

For the purpose of study, the owned dogs were selected on the basis of dog's history taken from owner and from the external examination of body condition. In case of stray dogs selection criteria were based only on external examination of body condition.

Chemicals used in laboratory

The KOH pellets marked by Nike Chemicals India were used for the preparation of KOH 10% solution. So, 10 g of KOH pellets were dissolved in distilled water in a volumetric flask to make a final volume of 100% KOH solution. Others materials like test-tubes, centrifuge, glass-slides, cover slips, hand lens, microscope etc. were used from Veterinary Clinic, Pulchok, HICAST, Gatthaghar as per convenience.

Method employed for the skin scrappings to detect mites (*Demodex*, *Sarcoptes*, *Cheyletielia*)

The scrapings were collected from the most affected part of the skin as there were more parasites on that part than in any other. Lesions on the skin were pressed with thumb and index finger of left hand and scraped the skin with right hand using glycerine dipped scalpel. The crusts of skin were scraped for several times in the same direction until blood oozes out. Samples were collected in plastic containers and the collected samples were examined in the laboratory for mites. Then the scrapings were transferred in the test tube containing 10 % KOH and heated until hair and epidermal scale dissolved without any damage to the parasites on heating. It was allowed to cool for some time and then it was centrifuged for 5-10 minutes at 1500-2000 rpm. Supernatants were discarded and remaining sediments were transferred to slide and covered with a cover slip. The sediment was observed for mites under low power (10x) in a microscope and then at 40x for clarification of species of mites (Chauhan and Chandra, 2007). For cheyletielia, scales/scruffs were also combed out on a dark paper and the movements of mites were detected on the debris (Urguhart *et al.*, 1987).

Method employed for ear mites

The deposits were taken from cotton swab and placed on the dark field background (dark surface/paper). Mites were seen by the help of hand lens as whitish moving specks. If necessary ear mites were transferred on a clean slide and a drop of oil was placed on it for microscopic examination. (Sloss et al., 1976).

Method employed for nasal mites

First of all, nasal sample was collected with the help of sterile nasal swab. It was then kept in the sterile vial and was transferred to a clean glass slide. Then, a drop of distilled water was added and finally examined under the microscope for identification of mites (Nasal Mites, 2010).

Data analysis

The data were collected from both primary and secondary sources. The collected data were analyzed statistically using Microsoft Excel Program. Descriptive statistics such as simple frequency, percentage and mean were used to analyze the data. Data were also presented in bar diagrams, in tables, graphs, pie charts to present in simplest form.

RESULTS AND DISCUSSION

Owned dogs

Total 60 samples from owned dogs were taken for study; CVH: 30 samples Vet. Clinic: 8 samples Mount Everest Kennel Club: 22 samples

Prevalence of positive and negative samples

Out of 60 samples examined, 34 samples were found positive in case of domesticated dogs representing the prevalence of 56% (Fig: 1). The present study showed that the mites are one of the important causative agents of the skin diseases in owned dogs of Kathmandu Valley. The finding of this study was slightly higher than 51% prevalence reported by Baidya (2006), and 44.41% and 46% recorded by Sah (2004) and Parajuli (2008), respectively. The higher prevalence rate obtained in this study might be due to the larger number of samples examined, lack of awareness in pet owners, frequent bathing of dogs with human soaps, lack of regular grooming, nutritional deficiency and indiscriminate use of immunosuppressive drugs.

Mites isolated in positive samples

Among 34 positive samples, 23 were *Demodex* and 11 *Sarcoptes*. The results showed that 68% *Demodex* species were isolated representing major mite infestation followed by *Sarcoptes* 32% (Fig: 2).



Fig 1: Prevalence of Positive and Negative Cases

Based on mites isolated, present study showed prevalence of *Demodex* to be highest followed by *Sarcoptes*. Demodectic mites are the normal flora on the cutaneous surface of the dog but due to the immunosuppression and alteration of the normal physiology of thus skin, the problem of mange get enhanced. This might be the reason for finding higher *Demodex* in this study.



Fig 2: Mites isolated in positive samples

Sex wise representation of samples

Out of total 60 samples, 35 were from males and 25 from females. Out of 35 samples from male, 20 were found positive and 15 were negative. Out of 25 samples from females, 12 samples were found positive and 13 were negative (Fig: 3).



Fig 3: Sex wise Positive and Negative cases

Sex wise representation of prevalence of mites

Out of total samples examined male represent 57% and female represent 43% prevalence of mites (Fig: 4). The highest prevalence of mites reported in males may be because of random sampling and less number of cases of female dogs brought to the hospital and clinics by the owners as they have more preference to keep male dogs.



Fig 4: Sex wise prevalence of mites

Breed wise representation of samples

Breeds were divided into 3 groups- Mongrel, Cross and Pure breed. 34 were from Pure breed group, 15 from Cross breed group and 11 from Mongrel. Out of 34 samples from pure breed group, 18 were found positive and 16 negative. Out of 15 samples from Cross breed group, 9 were found positive and 7 negative and out of 11 samples from Mongrel, 7 were found positive and rest negative (Fig: 5).



Fig 5: Breed wise Positive and Negative Cases

Breed wise representation of prevalence of mites-

Out of 3 breeds, Mongrel showed the highest prevalence of 64% affected followed by Cross 60% and Pure 53% (Fig: 6). Among breeds, Mongrels were found to be more affected followed by Cross and Pure breed group. This might be due to the management practice adopted for these pets as local breeds are not given good care and attention. They are mainly kept outside the house and are fed leftovers and there is also greater chance of coming in contact with street dogs.



Fig 6: Breed wise prevalence of mites

Age wise representation of Positive and Negative sample

Animals were divided into 4 groups; 0-3 years, 3-6 years, 6-9 years and 9-12 years. From 0-3 years, 5 out of 13 samples were found positive followed by 3-6 years, 15 out of 23 samples were found positive. From 6-9 years, 11 out of 19 samples were found positive again followed by 9-12 age groups, 3 out of 5 samples were found positive (Fig: 7).



Fig 7: Age wise Positive and Negative Cases

Age wise representation of prevalence of mites-

Among 4 age groups, 3-6 age groups were found to be more affected followed by 9-12 age groups, 6-9 age groups and 0-3 age groups representing the prevalence of 65%, 60%, 57% and 45%, respectively (Fig: 8). The higher positive cases reported in case of 3-6 age groups may be due the larger number of samples taken from these age groups as larger number of cases between these age groups were brought to the hospital and clinics by the owners. Better care and attention were given to small size of dogs so this might be the reason of least prevalence among these age groups as compared to others.



Fig 8: Age wise prevalence of mites

Stray dogs

Total 60 samples from stray dogs were taken for study-KAT: 30samples Animal- Nepal: 30samples

Prevalence of positive and negative samples

Out of 60 samples examined, 40 samples were found positive representing the prevalence of positive sample 67 % (Fig. 9). The present study showed that mites are the major cause of skin disease in stray dogs of Kathmandu Valley. Lack of balanced diet, lack of deworming, direct contact with other mangy dogs, lack of grooming and bathing and even dirty environment might be the possible reason for high prevalence of mites in street dogs.



Fig 9: Positive and Negative Cases

Mites isolated in positive samples

Among different types of mites the result showed that *Demodex* species were isolated 70% indicating the major mite infestation followed by *Sarcoptes* 30% (Fig. 10). Based on mites isolated from stray dogs, this study showed highest prevalence of *Demodex* followed by *Sarcoptes* species. Most of the street dogs are immunosuppresed; this might be the reason of finding higher *Demodex* in the study.



Fig 10: Mites Isolated in Positive Samples

Sex wise representation of samples

Out of 33 samples from females, 24 were found positive and 9 negative. Out of 27 samples from males, 16 samples were found positive and 11 negative.



Fig: 11: Sex wise Positive and Negative Cases

Sex wise representation of prevalence of mites

Of the total sample examined, female represent 73% and male represent 27% prevalence of mites. The main objective of both KAT and Animal-Nepal is Animal Birth Control so most of the dogs brought at these centers were females. Thus the larger number of sample was taken from females which might be the reason of highest prevalence in females as compared to males.



Fig: 12 Sex wise prevalence of mites

Comparison on prevalence of mites in owned and stray dogs-

The above results showed that prevalence of mites is higher in stray dogs as compared to owned dogs. Owned dogs get proper care from their owner and live in a cleaner environment; get treatment and get more or less well nourished diet whereas stray dogs do not. This might be the cause for higher prevalence of mites in stray dogs. Moreover, stray dogs spend their time mostly in searching eatables in garbage's at filthy areas. Pet dogs are kept individually and usually not in close contact with mangy dogs so there is a lesser chance of transmission. This might be the reason of higher prevalence of mites in stray dogs.

Conclusion

The high occurrence of mites in skin scrapings concludes that the mite is one of the major contributing factors for skin diseases in dogs of Kathmandu Valley. The results showed that 67% and 56% samples were positive for mites in stray and owned dogs respectively. Thus, the higher prevalence of mites implies that health care, balanced food and management of the animal are not given consideration. Of the total positive sample, 68% were *Demodex* and 32% were *Sarcoptes* species from the scrappings examined from owned dogs. Likewise 70% were *Demodex* and 30% *Sarcoptes* from the positive samples examined from stray dogs. Thus, on comparison between owned and stray dogs, it can be concluded that street dogs were having more skin disorders. Among mites, the *Demodex* were found to be more than the *Sarcoptes* species at both owned and stray dogs of Kathmandu valley. It causes a life threatening condition in dogs and results in great economic loss to the owners.

In the study among owned dogs, 3-6 age groups were found to be more affected than other age group. Among breed, Mongrel were found to be more affected. Similarly, male populations were found to be more affected than females. Whereas the study among stray dogs was carried out irrespective of age and breed as almost all of them were Mongrel and their ages were unknown. In the study among sex-wise prevalence, females represent the highest prevalence than the males.

Mange is the frustrating disease to the animal owners as it involves more time and economic expenditure. Hence, appropriate measures should be adopted. Any skin problem especially persistent skin irritation should always be watched carefully and be treated after proper diagnosis only.

Other mites (*Cheyletiella*, *Pneumonyssoides caninum* and *Otodectic cyanotis*) were found to be negative throughout the collected samples. The literature relating to their prevalent in Nepal was also not found.

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