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## Prevalence of canine demodicosis in Bikaner, Rajasthan

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### Abstract

Canine demodicosis caused by ectoparasitic mites of the genus *Demodex* is a major and common ectoparasitic disease of dogs. The present study was conducted to determine the prevalence of *Demodex* infection in pet dogs. During the period under study from September 2018 to February 2019, a total of 774 dogs were presented at Veterinary Clinical Complex, College of Veterinary and Animal Science, Bikaner, Rajasthan. Out of these 774 dogs, 240 (31%) dogs were having dermatological problem in which 25 dogs were positive for demodicosis (10.42%). Out of these 25 dogs, 19 were affected with generalized demodicosis (76% of demodicosis/ 7.91% of total dermatological cases) and 6 were affected with localized demodicosis (24% of demodicosis/ 2.5% of total dermatological cases). The prevalence in female dogs (68%) was higher than that in male dogs (32%). In the present study, the highest prevalence of canine demodicosis was recorded in dogs aged up to 2 years (72%) followed by 12% in 2 to 4 years and 16% in >4 years dogs. Out of 25 dogs breed-wise prevalence of canine demodicosis in the present study was found to be higher in Pug 12(48%), followed by mongrel 6(24%), Labrador 4(16%), German shepherd 2(8%), Dachshund 1(4%).

**Keywords:** Bikaner, canine demodicosis, *Demodex* infection, prevalence

### Introduction

Skin problems are one of the most common problems affecting dogs, of which those caused by ectoparasites like mites, fleas ticks and lice contributes a larger share. Demodectic mange is a very common ectoparasitic infestation, caused by *Demodex canis* and considered as parasites that can act as opportunistic pathogens in certain circumstances <sup>[1]</sup>

Canine demodicosis is categorized as localized and generalized according to the area of skin covered by the disease. Localized demodicosis occurs most commonly in young dogs of less than one year of age, and spontaneous remission occurs in most patients <sup>[2]</sup>.

Prevalence of canine demodicosis was unknown till now in Bikaner (Rajasthan), so the present study was taken up to study prevalence of demodicosis in canine age wise, gender wise, and breed was done.

### Materials and methods

The proposed research work was carried out during the period under study in cases presented with dermatological problems at Veterinary Clinical Complex (VCC), College of Veterinary and Animal Science, Bikaner from September 2018 to February 2019.

### Animals

The criteria for including dogs were history of pruriginous dermatitis and lesions characterised by erythema, papules, pustule, epidermal collarettes, crusts, alopecia, lichenification and hyperpigmentation. All the cases screened for dermatological disorders were clinically examined followed by skin scraping and bacterial culture was done.

### Anamnesis (History taking)

In the present study a complete history including age, gender, breed, hair coat, diet, deworming, seasonal occurrence of disease, origin of hair loss on body, duration of disease, intensity and frequency of itching if present occurrence of same disease in other dog of same kennel if any, previous investigation and therapy, any disease or lesion in member of the family of owners, use of disinfectant for cleaning floor and any other relevant information were collected from the dog owners which was recorded in the case history performa.

**Analysis of prevalence**

The prevalence of demodicosis was calculated among the total number of dermatological cases screened. The prevalence was further analyzed in relation to age, gender and breed.

**Clinical examination**

Cases showing dermatological lesions like alopecia, folliculitis, pustules, erythema, scales, hyper pigmentation and lichenification on clinical examination was suspected for demodicosis, selected for further examination.

**Results and discussion**

The present study was conducted to investigate prevalence of

canine demodicosis in relation to age, gender and breed.

**Prevalence of canine demodicosis**

During the study period of 6 months, a total of 774 dogs were presented at Veterinary Clinical Complex, College of Veterinary and Animal Science, Bikaner, Rajasthan. Out of these 774 dogs, 240 (31%) dogs were having dermatological problem in which 25 dogs were positive for demodicosis (10.42%). Out of these 25 dogs, 19 were affected with generalized demodicosis (76% of demodicosis/ 7.91% of total dermatological cases) and 6 were affected with localized demodicosis (24% of demodicosis/ 2.5% of total dermatological cases) [3, 4, 5]. (Table 1)

**Table 1:** Prevalence of canine demodicosis

Number having dermatological disorders	Number of cases positive for demodicosis out of 240	Prevalence of canine demodicosis (%)
240	25	10.42

**Age wise prevalence of canine demodicosis**

The age-wise prevalence of canine demodicosis is represented in Table 2 and Figure 2. In the present study, the highest prevalence of canine demodicosis was recorded in dogs aged up to 2 years (72%) followed by 12% in 2 to 4 years and 16% in >4 years dogs [6, 7, 8]. (Table 2 and Figure 1) They also observed that canine demodicosis occurred in dogs less than 18 months of age and adult dogs developed the disease less frequently.

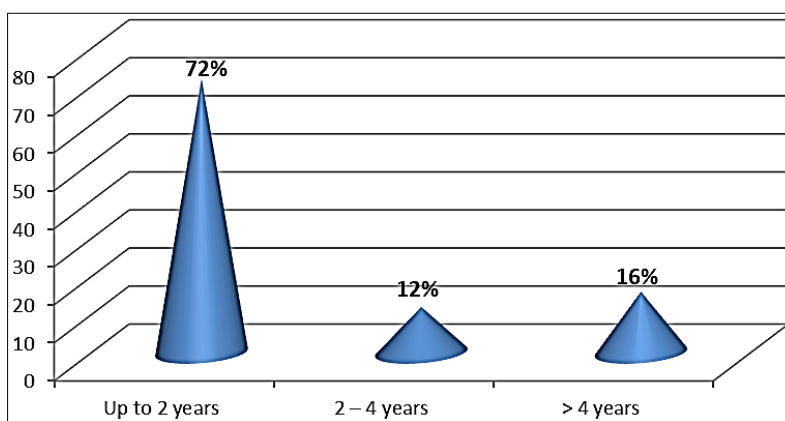
Higher prevalence of demodicosis in younger age group may be due to the fact that the puppies acquire the infection during the first few days of life while suckling milk from mother. During the puberty the sebaceous glands are stimulated by the

sex hormones and the mites get an opportunity to grow and multiply since they are sebophilic [9, 10].

In young animals, endoparasiticism, malnutrition and debilitation may lead to an immunocompromized state that favours mite proliferation and development of skin disease [11].

**Table 2:** Age wise prevalence of canine demodicosis (n= 25)

S. No.	Age groups	Number affected	Percentage (%)
1	Up to 2 years	18	72
2	2 – 4 years	3	12
3	> 4 years	4	16
Total		25	100



**Fig 1:** Age wise prevalence of canine demodicosis (n= 25)

**Gender wise prevalence of canine demodicosis**

In the present study, out of 25 dogs positive for canine demodicosis, 17 were female dog and 8 were male dog, showing high prevalence 68% in female dog compared to male dog showing 32% prevalence (Table 3 and Figure 2).

In the present study, higher incidence of demodicosis in female dogs might be attributed due to some predisposing factors like puberty, estrus, pregnancy, parturition and

lactation etc. [12, 13, 10]

**Table 3:** Gender wise prevalence of canine demodicosis (n= 25)

Gender	Number affected	Percentage (%)
Female	17	68
Male	8	32
Total	25	100

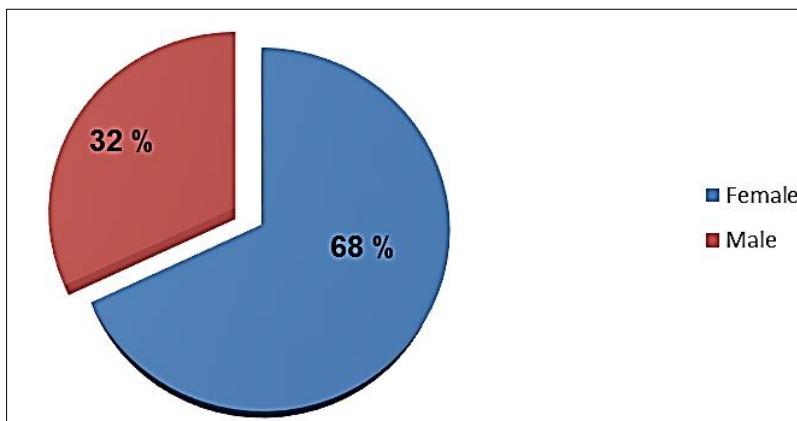


Fig 2: Gender wise prevalence of canine demodicosis (n= 25)

**Breed wise prevalence of canine demodicosis**

Out of 25 dogs breed-wise prevalence of canine demodicosis in the present study was found to be higher in Pug 12(48%), followed by mongrel 6(24%), Labrador 4(16%), German shepherd 2(8%), Dachshund 1(4%). (Table 4 and Figure 3) Similar observation were recorded by Solanki *et al.*, (2007) [14] and Pereira *et al.*, (2012) [15] who indicated that pure breeds are more susceptible to canine demodicosis than

crossbreeds. Similar to present study Kuznetsova *et al.* (2012) [16] also recorded that the pug was more predisposed to the infection of demodectic mange.

However the present higher prevalence of the canine demodicosis in Pug and non-descript dogs could be due to their predominant representation in the study. However, a study involving wide range of breeds with more number would be required for proper conclusions to be made.

Table 4: Breed wise prevalence of canine demodicosis (n=25)

S. No.	Name of the breed	No of dogs affected	Percentage (%)
1.	Pug	12	48
2.	Labrador Retriever	4	16
3.	German shepherd	2	8
4.	Dachshund	1	4
5.	Mongrel	6	24
	Total	25	100

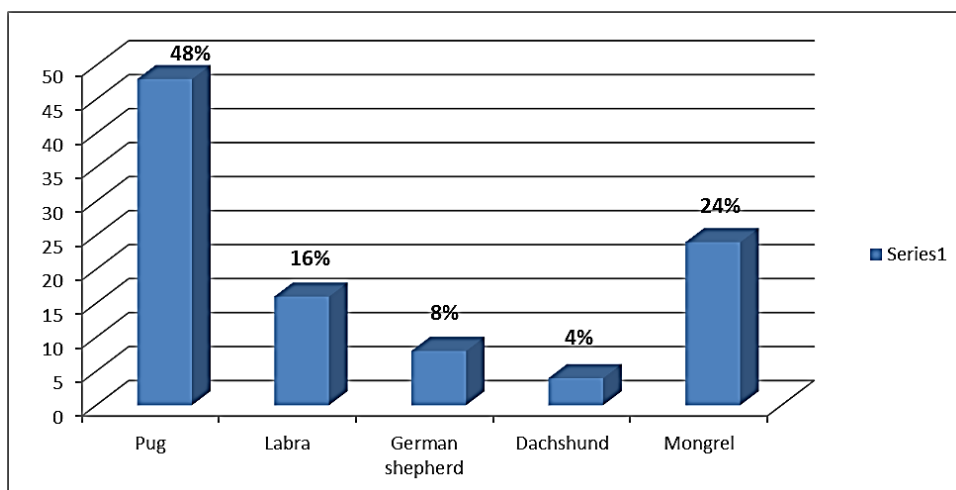


Fig 3: Breed wise prevalence of canine demodicosis (n= 25)

**Clinical findings**

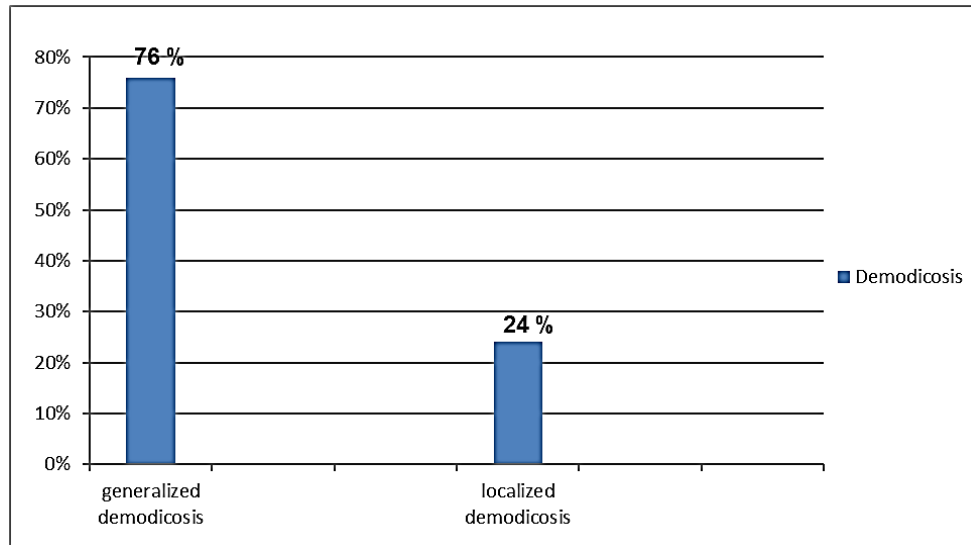
Out of 240 cases of dermatological problems, 25 dogs were found positive for demodex mite on skin scrapings examination. Clinical signs of these cases were recorded in the case sheet performa for dermatology. The dogs were categorized in to generalized and localized demodicosis based on the depth of lesions, extension of infection process. Cases in which presence of less than five circular alopecic areas on body were taken in localized form and whereas presence of more than five circular alopecic areas on body were taken in generalized demodicosis [17].

**Localized and generalized canine demodicosis**

In the present study out of 25 dogs with demodicosis, 19 (76%) were generalized form and 6 (24%) were localized form. (Table 5, Figure 4), the similar findings were also reported by Pereira *et al.* (2012) [15], who reported that 70% dogs had the generalised form and 30% had the localised form of demodicosis in their study and Mritunjaykumar *et al.* (2013) [18] found that 20.83% dogs suffered from localized demodicosis and 79.17% with generalised demodicosis.

**Table 5:** Localized and generalized canine demodicosis

Number of cases positive for demodicosis	Number of cases positive for generalized demodicosis	Percentage of generalized demodicosis (%)	Number affected with localized demodicosis	Percentage of localized demodicosis (%)
25	19	76	6	24



**Fig 4:** Percentage of Localized and generalized canine demodicosis out of total canine demodicosis cases

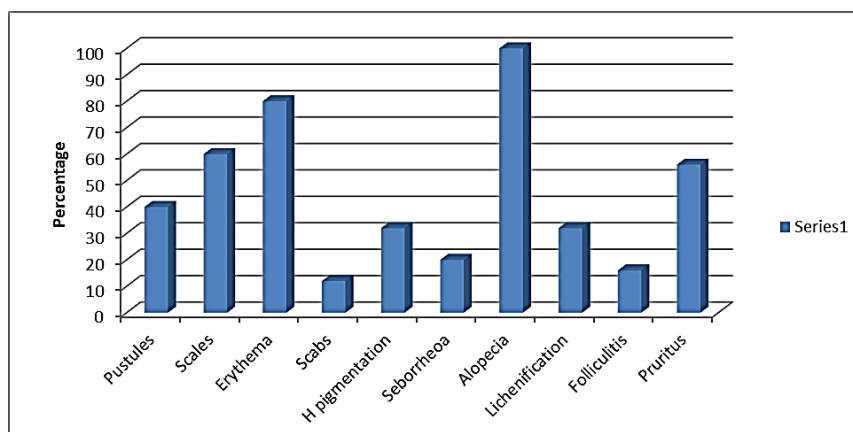
**Nature of lesion**

The dogs suffering from canine demodicosis revealed a wide variety of clinical manifestations. Clinical examination of 25 dogs with canine demodicosis revealed symptoms of alopecia in 25 dogs (100%), scales in 15 dogs (60%), erythema in 20 dogs (80%), pustules in 19 dogs (76%), pruritus in 17 dogs (68%), hyper pigmentation in 8 dogs (32%), seborrhea in 5 dog (20%), lichenification in 8 dogs (32%), Papules in 9 dog (36%), and scabs in 3 dog (12%) [19, 20, 21].

Alopecia is a consistent and remarkable clinical sign exhibited by almost all the affected dogs which might be resulted due to inflammations and irritations caused by the mites in the hair follicles (Muller *et al.*, 1989) [13]. Erythema or reddening of the skin is might be due to the inflammatory reaction occurring as a result of damage caused by epidermal cells or due to exudates produced by the infested mites in the skin or due to increased peripheral blood circulation.

**Table 6:** Nature of lesions seen in canine demodicosis (n= 25)

S. No.	Nature of lesion	No. of dogs affected	Percentage (%)
1	Pustules	19	76
2	Scales	15	60
3	Erythema	20	80
4	Scabs	3	12
5	Hyper pigmentation	8	32
6	Seborrhea	5	20
7	Alopecia	25	100
8	Lichenification	8	32
9	Papules	9	36
10	Pruritus	17	68



**Fig 5:** Histogram showing nature of lesion in canine demodicosis

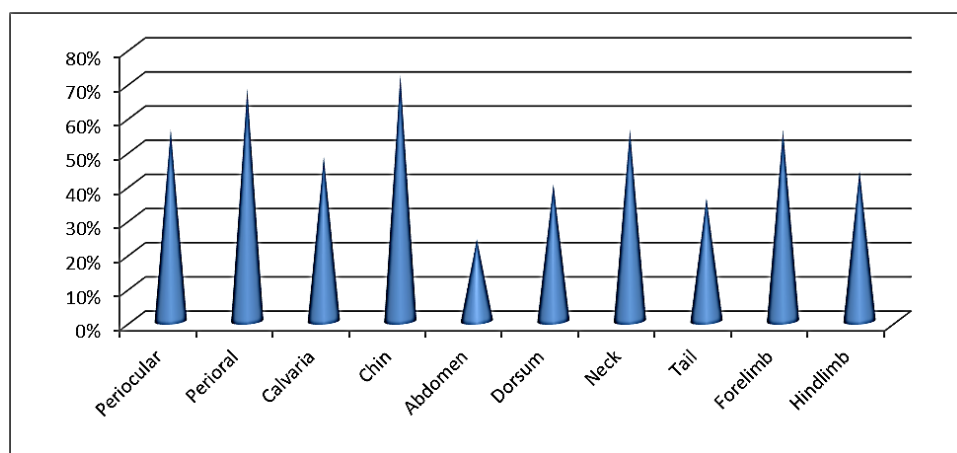
### Distribution of lesions

The lesions involved in different parts of the dogs with demodicosis were recorded. In the present study, face was the primary target site in dogs affected with demodicosis, in head position periocular area (56%), perioral (68%), calvaria (48%) and chin (72%) were the primary target site in dogs affected

with demodicosis followed by fore limbs (56%), hind limbs (44%), tail (36%), abdomen (24%), neck (56%) and dorsum (40%). These findings were similar to previous reports of Saridomichelakis *et al.* (2007)<sup>[22]</sup>, Boda (2016)<sup>[23]</sup> and Janus *et al.* (2014)<sup>[8]</sup>.

**Table 7:** Distribution of lesions in canine demodicosis (n= 25)

S. No.	Position	Area	Number affected	Percentage (%)
1	Head	Periocular	14	56
		Perioral	17	68
		Calvaria	12	48
		Chin	18	72
2	Body	Abdomen	6	24
		Dorsum	10	40
		Neck	14	56
		Tail	9	36
3	Limbs	Forelimb	14	56
		Hind limb	11	44



**Fig 7:** Pie diagram showing distribution of lesions in canine demodicosis (n=25)

### Conclusion

Based on the findings of present study, it was concluded that the prevalence of canine demodicosis among the total dogs examined with skin problems was 10.42% (25/240). Maximum numbers of cases were from the age group of less than 2 years. Prevalence was more common in female than male dogs.

In the present study higher prevalence of the disease was observed in Pug and Non-descript dogs.

In the present study 76% cases were generalized form and 24% cases were localized form of demodicosis.

In the present study, face was the primary target site in dogs affected with demodicosis Most common symptoms observed in canine demodicosis were mainly alopecia, erythema and pustules.

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