

*Article*

**Study on prevalence, diagnosis and treatment of dermatological disorders in hospitalized dogs at Madras Veterinary College (MVC), Chennai, India**

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**Abstract:** The skin, sometimes known as the integumentary System is, in fact, the largest organ of the body. It performs many functions that are important in maintaining homeostasis in the body. Probably the most important of these functions is the control of body temperature. The skin also protects the body from physical damage and bacterial invasion. The skin has an array of sense organs which sense the external environment and also cells which can make vitamin D in sunlight. A study was undertaken of the prevalence, diagnosis and treatment of dermatological disorders in hospitalized dogs at Madras Veterinary College (MVC), Chennai, India from 1<sup>st</sup> May to 30<sup>th</sup> May, 2017. Total 220 cases were observed and recorded that had a dermatological problem. Among the dog pruritus (86%), alopecia (63%), scaling (77%), maculo-papular-pustular lesion (91%) were the most common presenting sign. A diagnosis or recommendation for treatment was done on the basis of the presenting clinical signs, physical examination and various diagnostic tests. In this study most of the cases were diagnosed by multiple and deep skin scrapings (100 cases) and by dermato-histopathology (70 cases). The most frequently diagnosed cases were Malassezia dermatitis, Demodicosis, Scabies and Tick infestation. Tick infestation accounted for the majority of the diagnoses. Systemic antibiotics were prescribed in 9% cases, systemic antifungal drugs were prescribed in 7% cases, systemic glucocorticoids were prescribed in 10% cases, antihistaminic in 6% cases and treatment with an ectoparasiticide was prescribed in 73% cases.

**Keywords:** prevalence; pruritus; dermato-histopathology; scabies; ectoparasiticide

**1. Introduction**

The skin is the largest organ of the body. It plays an important role in different functions such as the perception of heat, cold, pressure, pain itch and immune protection. It also acts as a barrier between the animal and the environment. The common dermatological cases are Malassezia dermatitis, Demodicosis, Scabies, Mite infestation, Canine atopic dermatitis, Cutaneous adverse food reaction, Flea allergic dermatitis, Allergic contact dermatitis and Tick infestation etc. Dermatitis caused by the yeast *Malassezia pachydermatis* is common in dogs, are extremely pruritic and may occur in conjunction with concurrent or predisposing diseases such as allergic dermatitis or endocrinopathy (Daniel, 1999). Another common skin disease in dog is demodectosis caused by *Demodex canis*, *Demodex injai* (Mueller *et al.*, 2012). *Demodex canis*, which inhabits on the hair follicle, is mainly responsible for canine demodectosis than others (Ravera *et al.*, 2013). Sarcoptic mange is a highly contagious, intensely pruritic and potentially zoonotic skin disease condition of animals. It is caused by infestation of the skin by a mite, *Sarcoptes scabiei* var. *canis* which burrows into its hosts epidermis. Canine atopic dermatitis is a type of dermatitis where pruritus is the characteristic sign of feet, face, ears, flexural surfaces of the front legs, axillae, and abdomen are the most frequently affected areas and primary lesions

consist of erythematous macules, patches, and small papules (Moriello, 2001). Cutaneous adverse food reactions (CAFRs) comprise both food hypersensitivities (mediated by the immune system) and food intolerances (not involving the immune system). In flea allergic dermatitis, patient will present with at least one of the four common cutaneous reaction patterns indicative of pruritus and inflammation, head/neck/pinnal pruritus with excoriations, self-induced alopecia, miliary dermatitis, and/or eosinophilic lesions (including eosinophilic plaques, eosinophilic granulomas, and indolent ulcers. Allergic contact dermatitis although the cause is still unknown as its ubiquitous in nature and the clinical presentation may be a localized dermatitis to systemic hypersensitivity and also systemic drug-related flexural exanthema possibly due to the presence of many metal compounds (Krawiec and Gaafar, 1975). Tick infestations are associated with decreased productivity, loss of blood and blood proteins, transmission of diseases, debilitation, and even death. Feeding sites on the host vary with the tick species. Ticks are associated with an acute paralytic syndrome called Tick Paralysis. This disease is characterized by ascending paralysis and may lead to death if the tick is not removed before the paralysis reaches the respiratory muscles. Diagnosis is based on identification of the species (Smith *et al.*, 2011).

The diagnostic protocols usually use for investigating dermatological disorders are skin scrapping, coat brushing, food trial, drug response trial, woods lamp techniques, tape smearing and molecular techniques. Generally diagnosis is based on compatible historical and clinical information, as well as rolling out other causes of pruritus (Rahman, 2013).

The treatment protocol includes topical therapy like ketoconazole/miconazole shampoo, cypermethrin shampoos, spray, topical benzyl benzoate etc. and parenteral therapy includes ivermectin, dexamethasone, antibiotic preparation to prevent the secondary bacterial infection and antihistaminic preparation. Some antifungal preparations are also used to prevent the fungal diseases (Samad, 2008).

This study was carried out with the objectives of determining the prevalence of dermatological problems in dogs of Chennai area. This information can be helpful to canine practitioners as well as dog owners of Bangladesh to be concerned. In our country dogs, cats, and rabbits are often purchased as a pet, and most often children are involved with them. Considering the above mentioned facts the present study was designed to find out the prevalence of dermatological problem in hospitalized dogs at Madras Veterinary College (MVC), Chennai, India.

## **2. Materials and Methods**

### **2.1. Study area and study period**

The present study was conducted at Dermatology unit under department of clinics in Madras Veterinary College, located in Chennai city which is the capital of Tamilnadu Province. The duration of the study was May 1 to May 30, 2017.

### **2.2. Sample collection**

This study was conducted with hospitalized dogs (N=220) accused with skin diseases. Skin scraping samples were collected from the affected dogs. Samples (hair and scrapings) were collected with blunt scalpel blade just behind the extending margin in the infected area.

### **2.3. Data Collection**

The required information such as age, sex, body weight, breed, color, duration of illness, history of deworming, number of infected animals, body condition, management system (type of feed supplied, housing pattern, type of floor, vaccination, hygienic measurement) and owner complaint were collected directly from the owner of the animal for the diagnosis with providing a questioner.

### **2.4. Diagnosis**

Dermatological problems were diagnosed by physical examination, clinical findings and different lab tests.

#### **2.4.1. Clinical Examination**

Mostly the affected dogs showed clinical signs of maculo-papular-pustular eruption, pruritis, scaling, alopecia, cutaneous swellings, Pigmentation, otitis, abnormal odour and visible ectoparasites respectively (Figure 1).

#### **2.4.2. Physical Examination**

Physical examination included very close inspection of the entire hair coat and skin under strong lighting. Flashlights were used to examine the skin of animals. Primary lesions mainly seen were macules or patches,

papules or plaque, pustules, vesicles, or bullae, wheals, nodules or tumors. Secondary lesions include epidermal collarettes, scars, excoriation, erosions or ulcers, fissures, lichenification and calluses.

### 2.4.3. Diagnostic test

Laboratory examination of skin samples were done for isolation and identification of causal agent on the basis of morphology. Laboratory tests covered multiple and deep skin scrapping test, cytology, coat brushings, woods lamp technique, haematology, food trial, response to drug trial and dermato-histopathology (Figure 2).

## 3. Results

The present study was conducted at Dermatology unit under department of clinics in Madras Veterinary College, Chennai with hospitalized dogs (N=220) (Table1) accused with skin diseases. Among the 220 examined dogs, 40 (18.18%) were found to be infected with *Malassezia dermatitis* (Figure 5 and Figure 6), 45 (20.45%) were found to be tainted with *Demodecosis* (Figure 7 and Figure 8), 45 (20.45%) were seen to be affected with *Scabies* (Figure 9 and Figure 10), 10 (4.55%) were noticed to be infected with *Mite infestation* (Figure 11 and Figure 12), 5 (2.27%) were found to be infected with *Canine atopic dermatitis* (Figure 13), 15 (6.81%) were observed to be infected with *Cutaneous adverse food reaction* (Figure 14), 20 (9.10%) were examined to be infected with *Flea allergic dermatitis* (Figure 15 and Figure 16), 10 (4.55%) were identified for *Allergic contact dermatitis* (Figure 17) and 30 (13.64%) were recognized for *Tick infestation*.

Apart from this, among 220 dogs, 91% of affected dogs (n= 200) showed clinical signs i.e. Maculo-papular-pustular eruption, where 86% (n=190) dogs revealed signs of pruritis and 77% manifested the signs of scaling. The other important clinical findings showed by affected dogs were Alopecia (63%), Cutaneous swellings (61%), Pigmentation (57%), Otitis (48%), Abnormal odour (36%) and Visible ectoparasites (22%) respectively (Figure 1).

Amid of laboratory test, multiple and deep skin scrapping test were done for 100 cases. Other test which was done for diagnosis were Cytology 40 (18.19%), Coat brushings 50 (22.72%), woods lamp technique 50 (22.72%), Haematology 30 (13.63%), Food trial 20 (9.09%), response to drug trial 20 (9.09%) and dermato-histopathology 70 (31.81%) (Figure 2).

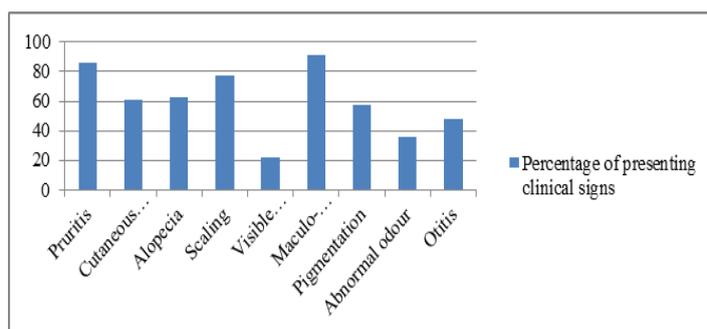


Figure 1. Graphical presentation of percentage of clinical signs for dermatological disorder.

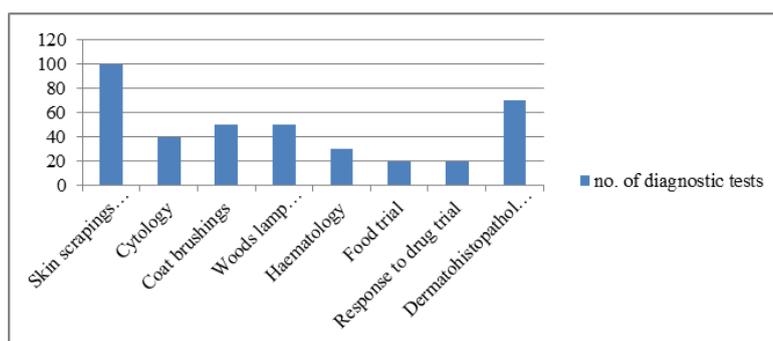


Figure 2. Graphical presentation of different diagnostic technique used for dermatological disorder.

As a treatment the affected dogs were treated subcutaneous injection of Ivermectin (59%) @0.2-0.4mg/kg B.wt sid and repeat after 15 days. 1% Ketoconazole/ meconazole shampoos (18%) and systemic antifungal drugs (16%) were used to combat fungal infection. Benzyl peroxide shampoos (45%) were used for bathe so that hair was opened. Topical 2.5% Benzyl benzoate (14%) was used for non burrowing mite infestation. Dexamethasone (23%) was indicated Intra-muscularly in case of canine atopic dermatitis and Allergic contact dermatitis to combat the infection. Similarly, Pheniramine maleate (14%) and antibiotics (20%) was indicated in affected dogs to combat allergic reaction and secondary bacterial infection. Cypermethrin shampoos were used (23%) for ectoparasitic infestation (Figure 3).

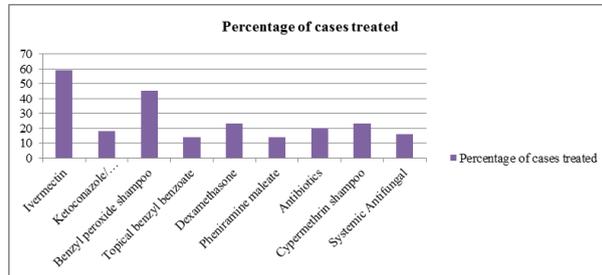


Figure 3. Graphical presentation of different treatment for dermatological disorder.

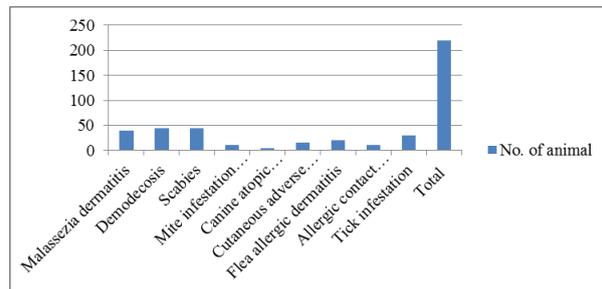


Figure 4. Graphical presentation of different dermatological disorder diagnosed.



Figure 5. Malassezia affected Dog.



Figure 6. Malassezia pachydermatis under microscope.



Figure 7. Demodecosis affected Dog.

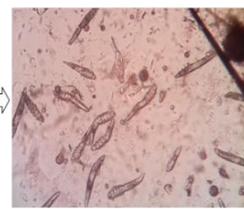


Figure 8. Demodex spp. under microscope.



Figure 9. Scabies affected Dog.

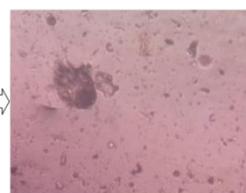


Figure 10. Sarcoptes scabiei under microscope.



Figure 11. Ear mite infestation in Dog.



Figure 12. *Otodectes cynotis* under microscope.



Figure 13. Canine atopic dermatitis. dermatitis



Figure 14. Cutaneous adverse food reaction in dog.



Figure 15. Flea allergic dermatitis in Dog.



Figure 16. Flea under microscope.



Figure 17. Contact allergic dermatitis affected Dog.

Table 1. Prevalence of dermatological disorders in dogs.

Total no. of dogs	Name of the disease	No. of positive dogs	Prevalence
220	Malassezia dermatitis	40	18.18%
	Demodicosis	45	20.45%
	Scabies	45	20.45%
	Mite infestation	10	4.55%
	Canine atopic dermatitis	05	2.27%
	Cutaneous adverse food reaction	15	6.81%
	Flea allergic dermatitis	20	9.10%
	Allergic contact dermatitis	10	4.55%
	Tick infestation	30	13.64%

#### 4. Discussion

In this study prevalence of *Malassezia dermatitis* at Madras Veterinary College, Chennai, India was found 18.18%. However, this finding is far lower than the finding of Nardoni *et al.* (2004), who conducted a study where the presence of *Malassezia spp.* yeasts was 63.4%, investigated in dermatological specimens of 224 dogs. The prevalence of canine demodicosis was to be found 20.45%. However, this finding is higher than the finding of Gunaseelan *et al.* (2011), who conducted a retrospective study in 3055 samples in Chennai city, India and the prevalence rate was found to be 10.5%. This difference might be due to poor management, poor body condition, lack of health treatment and improper nutrition and small sample size. In this research the prevalence of ear mite infestation was to be seen 4.55% which is not consistent with the findings of Ali *et al.* (2011) who indicated 62.5% prevalence mite infestation in the street dog at Dinajpur municipality area, Dinajpur,

Bangladesh, using simultaneous clinical and histopathological examination and identification. According to Radostits *et al.* (2007) and Soulsby (1982) well fed animals could better withstand parasite infestations than animals on an inadequate diet, which influenced the level of immunity. In agreement with this in the present study of the prevalence of mange mites was significantly higher in case of poor body conditioned animals than that of good body condition animals. In this study, the prevalence of canine atopic dermatitis was determined 2.27%. In a recent study, in the USA, 8.7% of the dogs were diagnosed with atopic/allergic dermatitis (Hnilica *et al.*, 2016). In case of cutaneous adverse food reaction the prevalence was to be found 6.81% which is almost similar to the study which was done in Italy. The prevalence of AFRs indogs with dermatological signs was 12%. Within 130 dogs only 12% dogs showed positive for cutaneous adverse food reaction (Torrese *et al.*, 2009). In this study, the prevalence of flea allergic dermatitis was showed 9.10% where as Greece, Fleas were identified from 129 dogs and 38 cats of random breed, sex and age. All these pets, were infested with fleas 71.3%. In this study, veterinarians were asked to select animals to examine at random without prior knowledge of whether the dog was carrying a tick or not. This suggested that many dogs carry ticks without their owners' knowledge and thus tick attachment to dogs and the potential risk for undiagnosed tick-borne diseases may be much higher than previously thought.

## 5. Conclusions

Skin disease is one of the leading group of diseases that is encountered very commonly in the community. Population-based studies should be performed to reliably define the prevalence of skin diseases. However, studies evaluating applications to hospital outpatient clinics also provide valuable information about the prevalence of skin diseases. Public health policies should be implemented in order to manage this problem rationally. This type of study will be helpful for the veterinarian & pet owner of our country which will open a new wisdom in the treatment of skin diseases in pets specially dogs.

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## Conflict of interest

None to declare.

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