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Occurrence and Risk Factors of Canine Atopic Dermatitis in Bengaluru Cohort Study

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Abstract

Canine atopic dermatitis (CAD) is a chronic, genetically mediated inflammatory skin disorder increasingly recognized in urban veterinary practice due to its complex interplay of environmental and immunological factors. This study aimed to evaluate the occurrence and demographic distribution of CAD among 449 dogs presenting with dermatological complaints to the Department of Veterinary Medicine, Veterinary College, Hebbal, Bengaluru. Diagnosis was confirmed in 35 dogs (7.80%) using Favrot's criteria [5]. Epidemiological variables including age, breed, sex, coat color, habitat, diet, and body weight were analyzed. CAD ranked as the third most common dermatological condition after pyoderma and tick infestation. The majority of affected dogs exhibited disease onset between one and three years of age, with Shih Tzus and mixed breeds being most frequently affected. Urban residency (65.71%), light coat color (45.71%), commercial diet (54.28%), and lower body weight (<5 kg; 37.14%) were significantly associated with CAD occurrence. While no significant sex predisposition was observed, the findings underscore the multifactorial nature of CAD in the Bengaluru cohort, shaped by genetic susceptibility, lifestyle practices, and urban environmental exposures. The study reinforces the diagnostic utility of Favrot's criteria [5], and highlights the need for heightened clinical awareness and tailored management strategies in metropolitan veterinary settings.

Keywords: Occurrence; Atopy; Chronic; Pruritus

Introduction

Canine atopic dermatitis (CAD) is a chronic, genetically predisposed inflammatory skin disease characterized by pruritus and hypersensitivity to environmental allergens. It is increasingly recognized as a significant dermatological concern in companion animals, particularly in urban environments where allergen exposure and lifestyle factors may amplify disease expression. CAD shares notable pathophysiological and immunological parallels with human atopic dermatitis, including IgE-mediated sensitization, epidermal barrier dysfunction, and microbial imbalance [10,14].

Historically, CAD was frequently misdiagnosed due to its clinical overlap with other pruritic conditions such as flea allergy dermatitis and food hypersensitivities [13,9]. The development of standardized diagnostic frameworks, notably the criteria proposed by [5], has significantly improved clinical recognition and epidemiological tracking of the disease. Reported prevalence rates of CAD vary widely, ranging from 3% to 30%, depending on geographic location, breed demographics, and diagnostic rigor [8,3,4]. While Western literature frequently cites breeds such as Labrador Retrievers and West Highland White Terriers as predisposed, regional studies suggest variability in breed susceptibility and environmental triggers.

The present study was conducted to assess the occurrence and clinicopathological features of CAD in dogs presented to the Department of Veterinary Medicine, Veterinary College, Hebbal. It aims to quantify CAD prevalence among dermatological disorders, identify demographic and environmental risk factors, and evaluate diagnostic consistency using Favrot's criteria [5].

Materials and Methods

The present study was conducted at the Department of Veterinary Medicine, Veterinary College, Hebbal, with the objective of evaluating the occurrence of canine atopic dermatitis (CAD) among dogs presenting with dermatological complaints. A total of 449 dogs exhibiting signs of pruritus and other dermatological abnormalities were included in the study. Each case was evaluated through clinical examination, and diagnoses were established based on clinical presentation, exclusion of differential diagnoses, and application of Favrot's criteria [5]. Favrot's criteria [5], a widely accepted diagnostic framework for CAD, were used to confirm diagnosis. These criteria include eight clinical features, of which a minimum of five must be fulfilled for a presumptive diagnosis. The features assessed included age of onset under three years, indoor lifestyle, glucocorticoid-responsive pruritus, pruritus without primary skin lesions (pruritus sine materia), involvement of ear pinnae with sparing of the margins, front paw involvement, and absence of lesions in the dorsolumbar region. Data were collected on various epidemiological parameters including age at presentation, age of onset, breed, sex, coat color, habitat (urban, semi-urban, rural), diet type, and body weight. Statistical analysis was performed using descriptive statistics to calculate frequencies and percentages. Chi-square tests were applied to assess associations between categorical variables, and one-way ANOVA was used to evaluate differences in lesion scores across body sites. A p-value of less than 0.05 was considered statistically significant.

Results

Out of 449 dogs presented with dermatological complaints, 35 dogs (7.80%) were diagnosed with canine atopic dermatitis (CAD) based on Favrot's criteria [5]. Pyoderma was the most prevalent condition (189/449; 36.97%), followed by tick infestation (122/449; 27.17%), flea allergy dermatitis (43/449; 9.57%), mite infestation (34/449; 7.57%), and food allergy (8/449; 1.78%). CAD ranked as the third most common allergic dermatosis. The distribution of dermatological conditions was statistically significant ($\chi^2 = 367.11$, df = 6, $p < 0.0001$).

Among the 35 CAD-affected dogs, age at presentation was highest in dogs over three years (17/35; 48.57%), followed by those aged one to three years (12/35; 34.28%) and six months to one year (6/35; 17.14%). However, age of onset analysis revealed that

most dogs developed clinical signs between one and three years (22/35; 62.86%), with mature onset (>3 years) in 10 dogs (28.57%) and early onset (6 months–1 year) in 3 dogs (8.57%). This distribution was statistically significant ($p = 0.00036$). Breed-wise, Shih Tzus were the most frequently affected (10/35; 28.57%), followed by mixed breeds (7/35; 20.00%), Labrador Retrievers (6/35; 17.14%), Golden Retrievers and Siberian Huskies (each 5/35; 14.29%), and Beagles (3/35; 8.57%). Gender wise occurrence showed a slight male predominance, with 19 males (54.29%) and 16 females (45.71%) affected. This difference was not statistically significant ($p \approx 0.612$), indicating no clear sex-based predisposition in the study population. Coat color analysis indicated that light-coated dogs were most commonly affected (16/35; 45.71%), followed by multi-colored coats (12/35; 34.28%) and dark-coated dogs (7/35; 20.00%). Habitat-based distribution revealed a marked predominance of CAD in urban dogs (23/35; 65.71%), followed by semi-urban (8/35; 22.85%) and rural environments (4/35; 11.43%). This variation was statistically significant ($p = 0.0001$), suggesting a strong environmental influence on disease occurrence. Dietary patterns showed that 19 dogs (54.28%) were fed commercial dog food, 10 dogs (28.57%) received home-cooked diets, and 6 dogs (17.14%) were on mixed diets. None of the affected dogs were on a raw diet. Body weight distribution revealed that the highest proportion of CAD cases occurred in dogs weighing less than 5 kg (13/35; 37.14%), followed by those in the 10–20 kg range (12/35; 34.28%) and 5–10 kg range (10/35; 28.57%).

These findings collectively underscore the multifactorial nature of CAD occurrence, with significant associations observed across age of onset, breed, gender, habitat, diet, coat color, and body weight within the CAD-affected population.

Discussion

The present study underscores the complex and multifactorial nature of canine atopic dermatitis (CAD), identifying it in 7.80% of dogs with dermatological complaints. Although CAD ranked third in prevalence after pyoderma and tick infestation, its clinical significance is amplified by its chronicity, diagnostic challenges, and impact on quality of life. The findings reaffirm that CAD predominantly affects young adult dogs, with a notable predisposition in certain breeds such as Shih Tzus, and is more frequently observed in urban environments—likely due to increased allergen exposure and reduced microbial diversity.

Key epidemiological associations were observed with indoor living, commercial diets, and smaller body size, all of which may contribute to immune dysregulation and barrier dysfunction. While no significant sex predisposition was found, coat color and breed-specific traits may influence susceptibility. The study also highlights the diagnostic utility of Favrot's criteria [5], in identifying CAD and supports the integration of clinical, environmental, and demographic data for accurate diagnosis and management.

In conclusion, this investigation contributes valuable regional data to the growing body of CAD literature and emphasizes the need for heightened clinical awareness, especially in urban veterinary settings. Future studies exploring genetic markers, environmental modifiers, and early-life exposures may further elucidate the pathogenesis and prevention strategies for this increasingly recognized dermatological condition.

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