A vertical study on the prevalence and clinical symptoms of canine pruritic dermatoses in Switzerland

S. Brem[1], L. Antoine[2], E. Maina[3], C. Favrot[1]

[1]Clinic for small animal internal medicine, Vetsuisse Faculty, University of Zurich, Zurich, Switzerland; [2]Boehringer Ingelheim, Lyon, France; [3]Médi-Vet SA, Lausanne, Switzerland

Eine vertikale Studie zur Prävalenz und klinischen Symptomatik juckender Dermatosen bei Hunden in der Schweiz

Bei Hunden ist wenig über die Prävalenz von Erkrankungen mit Pruritus generell und im Besonderen in Mitteleuropa bekannt. Ziel dieser Studie war es daher, (i) eine Prävalenzstudie von Erkrankungen mit Pruritus bei Hunden durchzuführen und (ii) das Signalement, sowie das Auftreten von Pruritus und Sekundärinfektionen bei atopischen Hunden in der Schweiz zu charakterisieren.

Siebzehn Tierärztinnen und Tierärzte aus der ganzen Schweiz haben an der vorliegenden Studie mitgewirkt. Insgesamt wurden 743 Fälle mit Pruritus während zwei kalten und zwei warmen Monaten aufgearbeitet. Atopische Dermatitis bei Hunden war die häufigste Diagnose in dieser Studie (59,1 %), gefolgt von Otitis (26,1 %), Pyodermie (22,6 %) und dem Befall mit Ektoparasiten (7,1 %). Französische Bulldoggen, West Highland White Terrier und American Staffordshire Terrier waren in der Gruppe mit atopischer Dermatitis im Vergleich zur allgemeinen Studienpopulation überrepräsentiert. Atopische Hunde mittleren Alters (49,9 %) und männliche (58,8 %) zwischen 10 und 25 kg (42,6 %) waren häufiger betroffen. Die Mehrzahl der Hunde mit atopischer Dermatitis (56 %) zeigte Pruritus an den Pfoten, gefolgt von Pruritus in der Pinna/dem Ohrkanal (48,1 %). Insgesamt wiesen 54,7 % der atopischen Hunde eine Pyodermie auf, während 31,8 % eine *Malassezia*-Dermatitis hatten.

Unsere Studie bestätigt den klinischen Eindruck der Mehrheit der Dermatologinnen und Dermatologen, dass die atopische Dermatitis die mit Abstand häufigste Ursache für Pruritus bei Hunden ist. Bemerkenswert ist die niedrige Prävalenz ektoparasitärer Erkrankungen (7,1 %). Insgesamt unterstreicht diese Studie die Bedeutung allergischer Hauterkrankungen in der Schweizer Hundepopulation.

Schlüsselwörter: Atopie, Canine atopische Dermatitis, Hund, Juckreiz, Pruritus

Abstract

https://doi.org/10.17236/sat00341

Eingereicht: 14.03.2024
Angenommen: 04.10.2024

Very little is known about the prevalence of pruritic diseases in dogs in general and central Europe in particular. Therefore, the goal of this study was (i) to carry out a vertical prevalence study on pruritic diseases in dogs and (ii) to characterize the signalment, distribution of pruritus and secondary infections of atopic dogs in Switzerland.

Seventeen veterinarians across Switzerland contributed to the study. All pruritic cases were collected in two cold and two warm months. A total of 743 cases were included. Canine atopic dermatitis was the most frequent diagnosis in this study (59,1 %), followed by otitis (26,1 %), pyoderma (22,6 %) and ectoparasites (7,1 %). French bulldog, West Highland White Terrier and American Staffordshire Terrier were overrepresented in the group with atopic dermatitis compared to the general study population. Middle aged (49,9 %), male (58,8 %) atopic dogs between 10 and 25 kg (42,6 %) were affected more frequent. The majority of dogs with atopic dermatitis (56 %) exhibited pruritus in the paws, followed by pinna/ear pruritus (48,1 %). In total 54,7 % of atopic dogs showed pyoderma, while 31,8 % had *Malassezia* dermatitis.

Our study confirms the clinical impression of the vast majority of veterinary dermatologists, that atopic dermatitis is by far the most frequent cause of pruritus in dogs. An intriguing finding is the remarkably low prevalence of ectoparasitic conditions (7,1 %). Overall, this study highlights the significance of allergic skin diseases in the Swiss dog population.

Keywords: Atopy, canine atopic dermatitis, dog, itch, pruritus

A vertical study on the prevalence and clinical symptoms of canine pruritic dermatoses in Switzerland

S. Brem, L. Antoine, E. Maina, C. Favrot

Introduction

Pruritus, as the foremost presenting sign constitutes a significant proportion of dermatological cases in dogs with prevalences reported between 25 and 40 %.[2,7,10,18] Several studies showed that dermatological cases are one of the most common reasons for veterinary consultation with estimations ranging from 15 to 25 %.[7,10] Nevertheless, to the author's knowledge very little is known of the prevalence of pruritic diseases in dogs in general and in central Europe in particular. Depending on the geographical region etiologies for pruritus include mainly canine atopic dermatitis (AD), flea hypersensitivity, parasitic, bacterial and fungal infections.[2]

Canine atopic dermatitis is one of the most common skin diseases in dogs. Prevalence between 3 and 15 % in the general dog population and between 3 and 58 % in dogs with dermatological conditions are reported.[8,12,16,17] Canine atopic dermatitis is a genetically predisposed, chronic, pruritic, and inflammatory skin disease induced by environmental and/or food allergens.[6] The age of onset is typically between 6 months and 3 years.[5] Predisposed breeds encompass terriers, retrievers, and commonly affected brachycephalic dogs.[16] In a study from Switzerland in 2008 the most presented breeds were West Highland White Terrier (11,6 %), Mixed breed (11,6 %), Labrador Retriever (8,5 %), Boxer (6,9 %), Golden Retriever (6,9 %) and German Shepherd (5,8 %).[4] The manifestation of pruritus and lesions tends to localize in specific anatomical regions, including the paws, ear canal/pinna, face, extensor surface of the carpal joint, flexor surface of the tarsal joint and the ventral aspect of the trunk (abdomen/inguinal).[14] However, it's worth noting that the distribution of pruritus and lesions can differ among breeds and potentially across diverse geographical areas.[9,19] Additionally, staphylococcal and/or *Malassezia* skin and ear infections are common due to the predisposition of atopic dogs.[11] Bacterial and yeast infections may however be associated with other non-allergic conditions such as ectoparasites or hormonal conditions. Various ectoparasitic conditions contribute to pruritus in dogs, with fleas being the most prevalent ectoparasite.[1,4,7] Demodectic mange is also frequently diagnosed but is not always associated with pruritus. Other conditions like *Cheyletiella*, lice, and *Trombicula autumnalis* appear less frequently. On the contrary, sarcoptic mange can be regarded as an emerging condition due to the proliferation of foxes in many countries, especially in urban or suburban areas. These ectoparasitic conditions are collectively relevant, because they often belong to the clinical differential diagnosis of AD.

The goal of this study was (i) to carry out a vertical prevalence study on pruritic diseases in dogs (ii) and to characterize the signalment, distribution of pruritus and secondary infections of atopic dogs in Switzerland. It involved the collaboration of seventeen veterinarians over two warm and two cold months.

Material and Methods

Study population and record of data

The Dermatology Department of the Clinic for Small Animals at the University of Zurich, in collaboration with a group of 16 veterinarians from private veterinary practices across Switzerland, contributed to this study. This group consisted of two board-certified specialists recognized by the European College of Veterinary Dermatology, along with 14 non-specialist practitioners operating independently in veterinary practices. Cases were collected during two cold and two warm months between February 2022 and May 2023, with the investigator selecting cold months between October and March and warm months from April to September. All cases of pruritus were planned to be collected at each veterinary facility. However, it was not possible for the authors to verify that all investigators included all cases of pruritus, and some may not have been included. While a definitive diagnosis was not mandatory for inclusion, concerted efforts were made to accurately identify the underlying cause of pruritus. If a patient was seen for a recheck or repeated treatment (e.g. allergen-specific immunotherapy) in the same month, it was only included once. However, if a patient was seen in a different month, it was included multiple times (e.g. Lokivetmabum injection, Cytopoint®, Zoetis). The participants were instructed to carry out enough diagnostic tests to establish a diagnosis. Support from an experienced board-certified dermatologist from the University of Zurich aided in complex cases, ensuring diagnostic consistency and minimizing errors across the participating centers.

The collected information including signalment, distribution of pruritus/lesions, pruritus visual analogue scale (PVAS), canine atopic dermatitis extent and severity index (CADESI-4) if applicable (suspicion allergy), diagnostic tests and treatment was submitted in a standardized form. A follow-up or images were not mandatory but could help to confirm the diagnosis. Some conditions are known to be secondary (e.g., pyoderma or *Malassezia* dermatitis), as diagnosing the primary cause often requires more time than one visit. This multi-step diagnosis was not always compatible with the protocol of the study and explains why some pyoderma, otitis and *Malassezia* dermatitis are subsequently classified as "without identified cause". Furthermore, food allergy diagnosis is often time consuming and the determination of allergens involved in AD caused by environmental allergens requires many consultations: this explains why many allergic dermatitis were not completely explored.

Specific diagnosis

The diagnosis of ectoparasites required the identification of ectoparasites with diagnostic tests (flea comb, skin scraping, scotch tape). Cases, where a veterinarian suspected ectoparasites despite not being able to detect them, were categorized within this group. Additionally, the diagnosis of sarcoptic

mange was made when clinical signs affected areas such as the ears or elbows and high pruritus was evident, confirmed by the investigator and validated by the University of Zurich. It's worth noting that the diagnosis might have been supported by a positive response to antiparasitic treatment. Dermatophytosis was diagnosed with positive trichoscopy, polymerase chain reaction (PCR), culture, or Wood's lamp, while *Malassezia* were identified with positive cytology. Bacteria were detected with positive cytology or culture. Diagnosing allergies (food and/or environmental induced allergic dermatitis, flea saliva allergy, contact allergy and allergic dermatitis to unknown stimulus) involved comprehensive patient history, ruling out similar conditions, and evaluating the distribution pattern of lesions. Criteria for the diagnosis of AD have been proposed by one of the authors and some others before but were established in referral practice settings and probably correspond with severe AD presented in such referral centers. These criteria have not been considered appropriate to such epidemiological studies and the investigators were not required to use them.[4,13,20] Food-induced AD implies a positive exclusion diet and rechallenge. A group AD without identified cause was for dogs with non-seasonal pruritus without any allergy test and without any elimination diet. Other diagnosis were based on histopathology, cytology (pemphigus), bloodwork/endocrinological function tests (hypothyroidism/hyperadrenocorticism) and imaging (Chiari-like malformation). Dogs could receive multiple diagnoses, such as an atopic dog also presenting with secondary pyoderma.

Statistical Analysis

Descriptive statistics for the prevalence of each diagnosis and the localization of pruritus was performed with Microsoft Excel (Microsoft Corporation (2023)). Comparison of the prevalence of diseases between the first warm and second warm, respectively the first cold and second cold month and both warm and cold months were carried out using Fisher exact tests. The same approach was used to compare the diagnoses of general practitioners and specialists. As AD was by far the main diagnosis, gender, ages and breeds were compared between pruritic allergic and pruritic non allergic dogs. As ectoparasitic dermatitis is the main differential diagnosis of AD lesion localization (Fisher exact tests) and pruritus intensity (t-tests) were compared between these two groups. Comparative analyses of ages, gender, and breeds were conducted among the study population, allergic dogs, and the entire Swiss canine population. The data of the entire Swiss canine population was retrieved from the AMICUS databank, where information about all chipped dogs in Switzerland is compiled. All these analyses were made using Graphpad Prism and results were considered statistically significant when $p < 0,05$.

Results

All dogs

Study population

Cases of canine pruritus of 25 cold and 22 warm months were collected (see table 1). Participating veterinarians enrolled between 1 and 55 cases per month. Figure 1 illustrates the geographical distribution of cases collected per veterinarian, revealing a non-uniform pattern. However, the Cantons represented accounted for 56,7 % of the Swiss population and 61,4 % of the canine Swiss population, ensuring substantial coverage despite regional variations. As shown in Table 1 not all veterinarians collected every month. Since there was no statistically significant difference in all analyses between the first cold (n=250) and second cold (n=137), respectively the first warm (n=252) and second warm month (n=104), all cases were included in the study (n=743). Twenty dogs were presented for veterinary consultation twice in a different month during the study period and were therefore enrolled twice. All other cases were only seen once during the study period. 47,5 % (n=353) of the cases were seen by specialists and 52,5 % (n=390) by general practitioners. Specialists made more frequently the diagnosis of AD (66,8 % vs 53,1 %, p=0,0001) than the general practitioners, while the contrary was true for otitis (31,2 % vs 21,7 %, p=0,0008). Ectoparasites were diagnosed in 5,1 % by general practitioners, respectively in 9,1 % by specialists. The proportions in ectoparasites and the other diagnoses, were not significantly different.

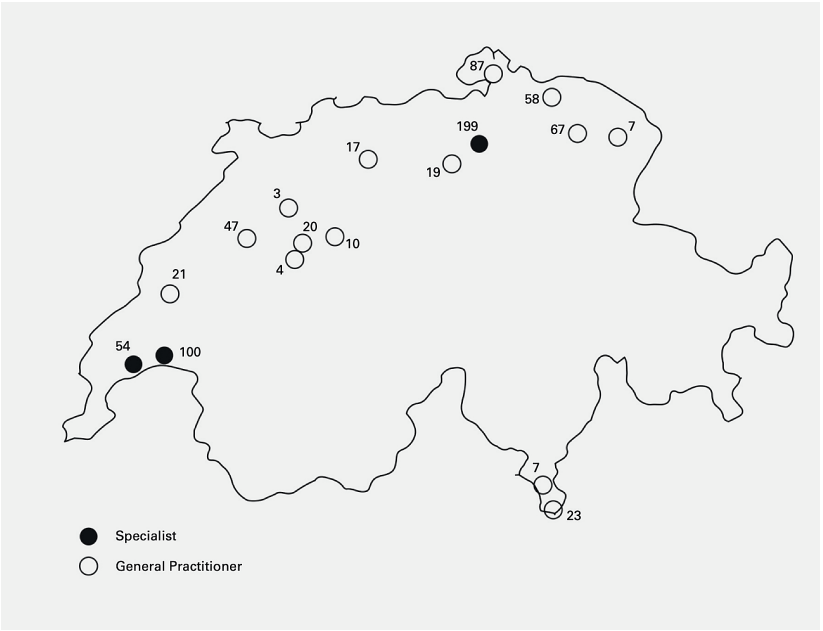

Figure 1: Map of Switzerland showing how many cases (n) different veterinarians collected in total. (©Lukas Hirschhofer)

The majority of the study population consisted of purebred dogs (89,2 %). The most represented breeds are shown in Table 2 and included French Bulldog (7,9 %), Labrador Retriever (5,9 %), Golden Retriever (3,2 %), German Shepherd (3,1 %), American Staffordshire Terrier (2,8 %) and West Highland White Terrier (2,3 %). Middle aged ≥3,5 <10,5 years old (50,3 %), male (56,9 %) dogs between 10 and 25 kg (43,3 %) were seen most. More importantly, 34 % of the dogs were younger than 3 years (34,2 %). This should be compared to the Swiss population where only 12,5 % of the dogs are so young (p<0,0001). Male dogs were overrepresented in our study population (56,9 %) which is not the case in the Swiss population (49,8 %, p<0,0001).

Diagnosis

In Table 3 the most common diseases in cold and warm months are outlined. Statistically, there was no significant variation in the prevalence of each disease between cold and warm months. Canine atopic dermatitis emerged as the most common diagnosis in this study, affecting 59,1 % (n=439) of the whole population (n=743). Among the atopic dogs (n=439), 82 % (n=360) had an unidentified cause. Environmental-induced AD was identified in 79,7 % (n=63) of cases among patients who underwent an allergy workup (n=79). The second most common diagnosis was otitis with 26,1 % (n=194) of all dogs (n=743). Allergic Otitis was diagnosed in 49 % (n=95) of dogs with Otitis (n=194) and 47,4 % (n=92) had no identified cause. Pyoderma was present in 22,6 % (n=168) of all patients (n=743). Allergy, as an underlying disease, was identified in 63,7 % (n=107) and 30,4 % (n=51) had no identified cause of dogs with pyoderma (n=168). Ectoparasites were seen in 7,1 % (n=53) of all patients (n=743). Fleas were diagnosed in 30,2 % (n=16), scabies in 28,3 % (n=15) and other parasites in 41,5 % (n=22) of dogs with ectoparasites (n=53). *Malassezia* dermatitis was present in 7,8 % (n=58) of all patients (n=743). Atopic dermatitis was diagnosed in 89,7 % (n=52) as an underlying disease and 10,3 % (n=6) had no identified cause of dogs with *Malassezia* dermatitis (n=58). Sebaceous adenitis was identified in 0,7 % (n=5), Lupus erythematosus in 0,1 % (n=1) and pemphigus in 0,5 % (n=4) of the study population (n=743). Dermatophytosis was present in 0,7 % (n=5) and endocrinological diseases in 0,5 % (n=4) of all dogs (n=743). Licking dermatitis was diagnosed in 1,5 % (n=11), hotspot in 1,5 % (n=11), anal sacculitis in 1,2 % (n=9) and neoplasia in 0,7 % (n=5) of the included dogs (n=743). Neoplasia included T-cell lymphoma (n=2), mast cell tumor (n=1), sebaceous adenoma (n=1) and perianal adenoma (n=1). Others included alopecia X (n=2), metatarsal fistula (n=2), leishmaniasis (n=1), othematoma (n=1), fibroadnexal hamartoma (n=1), anal sac impaction (n=1), Chiari-like malformation (n=1), bacterial paronychia (n=1), inflamed cutaneous cyst (n=1), hyperkeratotic erythema multiforme (n=1), perianal fistula (n=1) and eosinophilic furunculosis (n=1). As the main differential diagnosis of AD are the ectoparasites, special emphasis has been placed on examining the clinical characteristics of both disease groups. These analyses showed that ectoparasites disease

Table 1: Cases collected (n) per veterinarian.

Vet N°	GP/Specialist	Cold months (n)		Warm months (n)	
		Cold 1	Cold 2	Warm 1	Warm 2
1	GP	4	1	2	–
2	Specialist	29	–	25	–
3	GP	7	–	10	–
4	GP	13	–	8	–
5	GP	6	4	9	–
6	Specialist	42	15	33	10
7	GP	4	–	4	2
8	GP	3	–	4	–
9	GP	12	17	29	–
10	GP	25	15	22	25
11	GP	2	–	1	–
12	GP	–	–	4	–
13	GP	15	14	26	12
14	GP	8	10	19	10
15	GP	5	10	8	–
16	GP	20	–	–	–
17	Specialist	55	51	48	45

GP = general practitioner

affects most frequently the dorsal aspect of the body (p=0,0003) and the limbs (p<0,0001) while AD induces more frequently signs on the paws (p<0,0001). As well the pruritus is higher when ectoparasites (PVAS mean: 6,8) are involved as for AD (PVAS mean 6,8 versus 5,1, respectively, p=0,05).

Dogs with canine atopic dermatitis

Signalment

In Table 4 the signalment of dogs with AD in the study population is shown. French bulldog was the breed most represented with 11,2 % of allergic dogs followed by Labrador Retriever (6,8 %), American Staffordshire Terrier (4,3 %), West Highland White Terrier (3,4 %), German Shepherd (3,4 %) and Golden Retriever (3,4 %). Other breeds were seen in less than 3,4 %, while 8,9 % were mixed breed dogs. French bulldogs, West Highland White Terrier and American Staffordshire Terriers were overrepresented in the study population with p values of 0,0003, 0,02 and 0,003, respectively. These results were also compared to the average prevalence of each breed registered in Switzerland during the study period (AMICUS Databank). American Staffordshire Terriers had the greatest relative risk (RR) of 9 (p<0,0001) for being presented to a veterinarian because of AD, followed by West Highland White Terrier with RR=5,7 (p<0,0001), French Bulldogs with RR=4,2 (p<0,0001), German Shepherd with RR=2 (p<0,001), Labrador Retriever with RR=1,6 (p<0,003) and Golden Retriever with RR=1,6 (p<0,02).

Middle aged ≥3,5<10,5 years old (49,9 %), male (58,8 %) dogs between 10 and 25 kg (42,6 %) were seen most. This distribution is not statistically different from the study population. When compared to AMICUS dataset, one can confirm that atopic dogs of this population are much younger than Swiss dogs considered all together (p<0,0001).

Males were overrepresented, mirroring the pattern observed in the study population (with no significant difference). When compared to AMICUS, where males and females are almost equally represented (male/female ratio: 0,99) the difference is highly significant (p=0,001).

Table 2: Signalment of all dogs (n=743).

		n	%
Breed	French Bulldog	59	7,9
	Labrador Retriever	44	5,9
	Golden Retriever	24	3,2
	German Shepherd	23	3,1
	American Staffordshire Terrier	21	2,8
	West Highland White Terrier	17	2,3
	Others*	475	63,9
	Mixed Breed	79	10,6
	Unknown	1	0,1
Age (years)	<0,5	13	1,7
	≥0,5 <3,5	254	34,2
	≥3,5 <10,5	374	50,3
	≥10,5	100	13,5
	Unknown	2	0,3
Sex	Male	251	33,8
	Male neutered	172	23,1
	Female	151	20,3
	Female neutered	168	22,6
	Unknown	1	0,1
Weight	<4 kg	23	3,1
	>4–10 kg	151	20,3
	>10–25 kg	322	43,3
	>25 kg	246	33,1
	Unknown	1	0,1

*Others: Breeds with n<17, respectively <2,3 % of population

Table 3: Prevalence of diseases.

		Cold months (n = 387)		Warm months (n = 356)	
		n	%	n	%
Allergy	Total	215	55,6	228	64,0
	AD without identified cause	172	44,4	188	52,8
	Food-induced AD	6	1,6	4	1,1
	Environment-induced AD	32	8,3	31	8,7
	Food and environment-induced AD	5	1,3	1	0,3
	Flea saliva allergy	0	0	2	0,6
	Others*	0	0	2	0,6
Otitis	Total	103	26,6	91	25,6
	Allergic	46	11,9	49	13,8
	Without identified cause	50	12,9	42	11,8
	Foreign body	2	0,5	0	0
	Cerumen plug	3	0,8	0	0
	Polyp	1	0,3	0	0
	Post grooming	1	0,3	0	0
Pyoderma	Total	73	18,9	95	26,7
	Allergic	46	11,9	61	17,1
	Without identified cause	21	5,4	30	8,4
	Intertrigo	4	1,0	2	0,6
	Mucocutaneous	1	0,3	2	0,6
	Secondary to flea infestation	1	0,3	0	0
Ectoparasites	Total	35	9,0	18	5,1
	Fleas	10	2,6	6	1,7
	Scabies	12	3,1	3	0,8
	Trombicula	0	0	6	1,7
	Lice	2	0,5	0	0
	Cheyletiella	2	0,5	0	0
	Demodex	3	0,8	2	0,6
	Strong suspicion**	6	1,6	1	0,3
Malassezia dermatitis	Total	31	8,0	27	7,6
	Allergic	25	6,5	27	7,6
	Without identified cause	6	1,6	0	0
Immune mediated diseases	Sebaceous adenitis	4	1,0	1	0,3
	Lupus erythematodus	1	0,3	0	0
	Pemphigus complex	2	0,5	2	0,6
Dermatophytosis	Microsporum canis	1	0,3	1	0,3
	Trichophyton	1	0,3	2	0,6
Endocrinological diseases	Hypothyroidism	2	0,5	0	0
	Hyperadrenocorticism	1	0,3	1	0,3
Others	Lick Dermatitis	8	2,1	3	0,8
	Hotspot	6	1,6	5	1,4
	Anal sacculitis	6	1,6	3	0,8
	Neoplasia	2	0,5	3	0,8
	Others	10	2,6	4	1,1
	Unknown	15	3,9	18	5,1

AD: canine atopic dermatitis
*Others include contact allergy (1) and an allergic dermatitis to unknown stimulus (1)
**With performed tests, ectoparasites were not confirmed at visit

Distribution of Pruritus

Figure 2 demonstrates the distribution of pruritus in dogs with AD. Predominantly, 56 % (n=246) exhibited pruritus in the paws, followed by 48,1 % (n=211) experiencing pinna/ear pruritus among the allergic dogs (n=439). The ventral aspect of the trunk was reported in 37,8 % (n=166), the face in 22,6 % (n=99), the limbs in 14,1 % (n=62), the perianal/-genital region in 6,8 % (n=30), the dorsal aspect in 6,4 % (n=28), the throat/neck in 5,9 % (n=26) and the lateral aspect of the trunk in 5,2 % (n=23) of dogs with AD (n=439). Further, in 7,5 % (n=33) of allergic dogs (n=439) the veterinarian described a generalized pruritus.

Secondary infections

Secondary infections (skin or ear infection with *Malassezia* and/or bacteria) were identified in 239 allergic dogs. However, in three cases with positive cytology, the sample source was unclear and hence excluded from Table 5. In 84 cases cytology was negative and in 116 cases cytology was not performed. 70,8 % (n=167) of dogs with secondary infections showed pyoderma and/or *Malassezia* dermatitis. Out of these 167 dogs 55,1 % (n=92) had pyoderma alone, 22,8 % (n=38) had *Malassezia* dermatitis alone and 22,2 % (n=37) had both. Further 41,1 % (n=97) of dogs with secondary infections had bacterial and/or *Malassezia* otitis. Bacterial otitis alone was diagnosed in 24,7 % (n=24), *Malassezia* otitis alone in 47,4 % (n=46) and in 27,8 % (n=27) both was identified in these 97 patients.

Discussion

To the best of our knowledge, this study is the first aiming at determining the cause of pruritus in dogs and the prevalence of each pruritic condition, this innovative approach could support Swiss veterinarians for their differential diagnosis of dog with pruritic symptoms. Previously, Hill and coworkers considered all dermatological conditions taken together and Favrot and coworkers considered only dogs with pruritus but the focus of the study was the diagnosis criteria for AD and a detailed attention was not paid to non-allergic diseases.[4,7] Additionally, the named study of Favrot et al. was international which prevent excessive comparisons with the current study, which was carried out in Switzerland only.[4]

Nevertheless, our study faces several limitations common

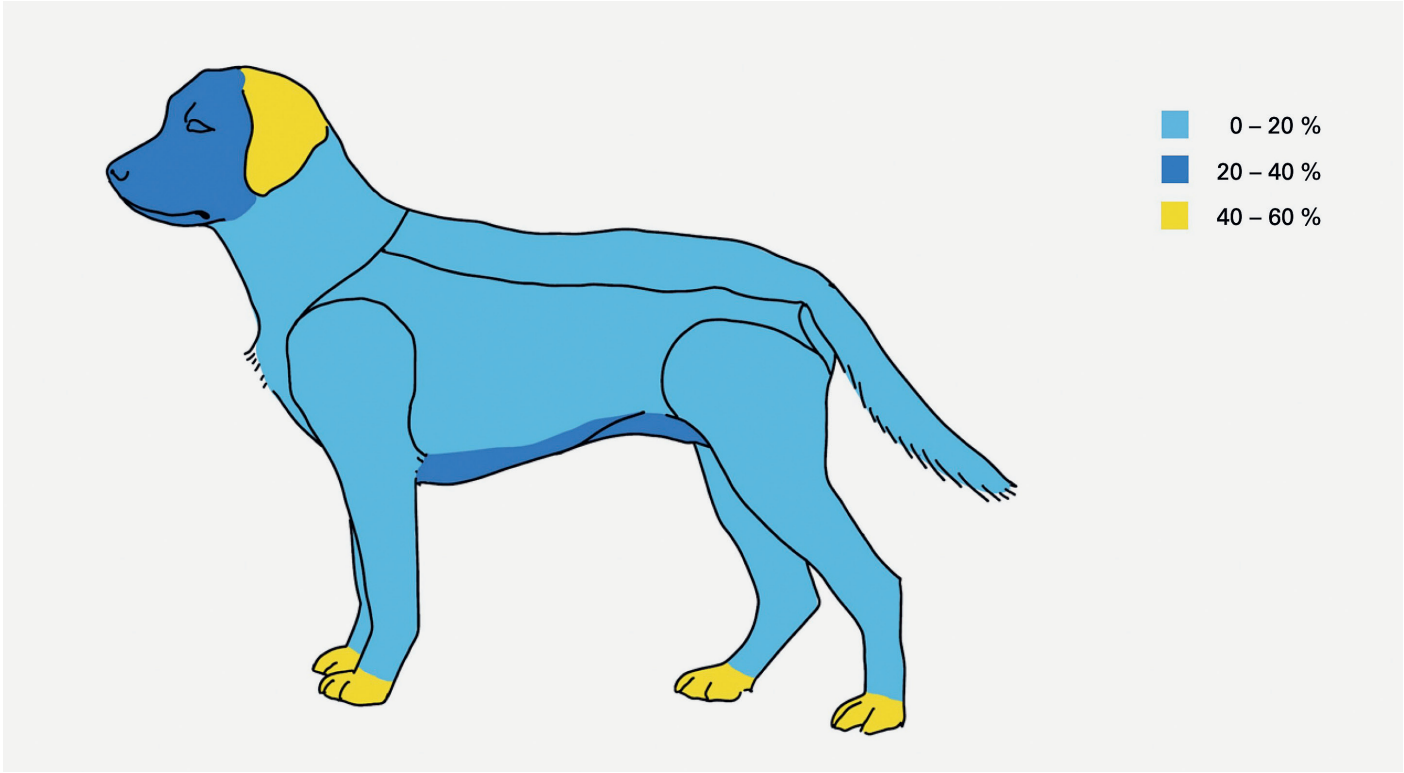

Figure 2: Schematic drawing of a dog indicating the distribution of pruritus of dogs diagnosed with atopic dermatitis (n=439). (©Lukas Hirschhofer)

to epidemiological works. First, it was confined to a single country and only a segment of its population was included. Second, although both general practitioners and specialists contributed to the diagnoses, specialists accounted for almost 50 %, limiting extrapolation to the wider dog population. Despite these limitations, including specialists was crucial, considering that, in Switzerland, direct consultation with specialists, bypassing general practitioners, is not uncommon.

Another critical concern is the accuracy of diagnoses. While stringent efforts were made to ensure accuracy, some diagnoses might have been incomplete or incorrect. Our goal was instantaneous diagnosis rather than exhaustive investigation, potentially leaving many allergy cases without a specific allergen identification and leaving primary causes of secondary conditions (pyoderma, *Malassezia* dermatitis, otitis) undescribed. That said, the study shed very interesting new light on this very frequent clinical sign and cause of veterinary consultation. The protocol mentioned that all cases of pruritus should be included, but as mentioned earlier, it cannot be excluded that some investigators did not include some of their cases of pruritus. In particular, this could be the cases where pruritus occurred in combination with other clinical signs or where pruritus was only a secondary aim of the consultation. This may have led to an underestimation of mild or chronic cases of AD. One notable observation is the very high prevalence of allergic disease among patients with pruritus. This could be seen as very different from the results presented by Hill and coworker where only 27 out of 428 dermatoses with a definitive diagnosis were allergic dogs.[7] However, this study included all dermatoses, including many that are usually not pruritic. Additionally, some of the non-allergic conditions are often associated with allergy (pyoderma, *Malassezia* dermatitis, otitis). When all conditions described in this study are compared to the number of dogs with dermatoses associated generally with pruritus, allergy involvement reaches 59 %, which is not so far from our own evaluation. In the study by Favrot, 71 % of the pruritic dogs got AD but one should keep in mind that the goal of this study was to recruit atopic dogs and to compare them with non-atopic pruritic dogs.[4] The study cannot be deemed a prevalence study, and evidently, the number of atopic dogs has been overestimated.[4]

Table 4: Signalment of dogs with atopic dermatitis (n=439).

		n	%
Breed	**French Bulldog**	49	11,2
	Labrador Retriever	30	6,8
	American Staffordshire Terrier	19	4,3
	West Highland White Terrier	15	3,4
	German Shepherd	15	3,4
	Golden Retriever	15	3,4
	Others*	257	58,5
	Mixed Breed	39	8,9
Age	<0,5	7	1,6
	≥0,5 <3,5	168	38,3
	≥3,5 <10,5	219	49,9
	≥10,5	44	10,0
	Unknown	1	0,2
Sex	Male	154	35,1
	Male neutered	104	23,7
	Female	83	18,9
	Female neutered	97	22,1
	Unknown	1	0,2
Weight	<4 kg	13	3,0
	>4–10 kg	79	18,0
	>10–25 kg	187	42,6
	>25 kg	160	36,4

Bold breed: predisposed for AD
*Others: Breeds with n<15, respectively <3,4 % of population

Nevertheless, our study confirms the clinical impression of the vast majority of veterinary dermatologists, that allergic dermatitis and especially AD are by far the most frequent cause of pruritus in dogs at least in central Europe.

An intriguing finding is the remarkably low prevalence of ectoparasitic conditions (7,1 %). In the study by Hill, ectoparasitic diseases inducing pruritus represented 14 % of the conditions usually associated with pruritus while in the study by Favrot and coworkers ectoparasites were diagnosed in 15 % of the included dogs.[4,7] The question raised here is, whether this difference represent a true decrease of the prevalence of these conditions or if the figures are specific from Switzerland. In fact, one could imagine that Swiss owners use more extensively ectoparasitic treatments than other owners. Another explanation would however be, that the introduction of the highly effective and comparatively safe isoxazolines was associated with a decrease of the prevalence of parasites. The study cannot naturally answer the question definitively and more focused studies would be needed, but it is the clinical impression of the owners and veterinarians that demodectic and sarcoptic mange are rarer than before.

Another intriguing aspect of the study is the infrequency of dermatophytosis and other fungal infections. The most logical explanation here is the way of life of the majority of dogs in the country (urban, decrease of hunting activities).

The overrepresentation of male atopic dogs is due to the overrepresentation of this gender in the atopic group. This very interesting finding was already mentioned by Favrot and coworkers in a study studying West Highland White Terrier in Switzerland.[3,15] This male predisposition was never mentioned before and also the genetic studies carried already did not associated the disease with the X gene. As well the study population is younger that the general Swiss canine population. This is also due to the overrepresentation of atopic dogs. It is in fact very well known that AD starts in young dogs.[5] Our study's observations on breed predisposition echo global and Swiss-specific knowledge.[4,9,19] In total 54,7 % of atopic dogs showed pyoderma, while 31,8 % had Malassezia dermatitis. These results go in hand with the previously reported prevalence by Favrot et al.[4] As ectoparasites represent the main differential of allergic conditions, it was important to compare both phenotypes. Without any surprise, the study showed that feet are more frequently affected in atopic dogs while the limbs and the dorsum is more affected in dogs with ectoparasites. As well, the pruritus is usually more intense with parasites than with allergy. Overall, this study highlights the significance of allergic skin diseases in the Swiss dog population. To the author's knowledge, it stands as the first in Switzerland to delineate the prevalence of the most common pruritic diseases in dogs.

Acknowledgements

The authors thank Boehringer Ingelheim for the funding and the following practices/clinics for including cases: Vettrust St. Gallen Ost (V. Daniele, I. Bänziger), Vetmidi Etoy (E. Castilla), Anicura Homberg (E, Jäggi), Cabinet Vétérinaire des Jordils (A. Parvis), Tierarztpraxis Kemper (M. Kemper), Medi-Vet SA (E. Maina), Emmevet (M. Müller), Veterinario Volonte (C. Volonté), Tierklinnik Tezet (C. Volz), Rhenus Tierklinik (S. Germann, M. Trächsel, N. Oetiker), Kleintierpraxis Bütikofer (S. Bütikofer, A. Bösch), VETcetera (M. Burri), Tierklinik Glattfeld (S. Audergon), Kleintierpraxis im Moos (A. Geissbühler, A. Bittner), Studio Veterinario Nägeli (C. Nägeli), Kleintierpraxis Aare Nord (F. Stucki, K. Torriani, S. Jünger).

Table 5: Secondary infection in dogs with canine atopic dermatitis (n=236).

		n	% of atopic dogs
Pyoderma and/or *Malassezia* dermatitis	Total	167	70,8
	Pyoderma alone	92	39,0
	Malassezia dermatitis alone	38	16,1
	Both	37	15,7
Bacterial and/or *Malassezia* otitis	Total	97	41,1
	Bacterial alone	24	10,2
	Malassezia alone	46	19,5
	Both	27	11,4

A vertical study on the prevalence and clinical symptoms of canine pruritic dermatoses in Switzerland

S. Brem, L. Antoine, E. Maina, C. Favrot

Étude verticale de la prévalence et des symptômes cliniques des dermatoses prurigineuses canines en Suisse

La prévalence des maladies prurigineuses chez le chien est très peu connue de façon générale et en Europe centrale en particulier. Le but de cette étude était donc (i) de réaliser une étude de prévalence verticale des maladies prurigineuses chez le chien et (ii) de caractériser la signalement, la distribution du prurit et des infections secondaires chez les chiens atopiques en Suisse.

Dix-sept vétérinaires de toute la Suisse ont contribué à l'étude. Tous les cas de prurit ont été collectés pendant deux mois froids et deux mois chauds. Au total, 743 cas ont été inclus. La dermatite atopique canine était le diagnostic le plus fréquent dans cette étude (59,1 %), suivie par l'otite (26,1 %), la pyodermite (22,6 %) et les ectoparasites (7,1 %). Les bouledogues français, les West Highland White Terriers et les American Staffordshire Terriers étaient surreprésentés dans le groupe des chiens atteints de dermatite atopique par rapport à la population générale de l'étude. Les chiens atopiques d'âge moyen (49,9 %), de sexe mâle (58,8 %) et pesant entre 10 et 25 kg (42,6 %) étaient plus fréquemment touchés. La majorité des chiens atteints de dermatite atopique (56 %) présentaient un prurit au niveau des pattes, suivi d'un prurit au niveau du pavillon de l'oreille (48,1 %). Au total, 54,7 % des chiens atopiques présentaient une pyodermite, tandis que 31,8 % avaient une dermatite *à Malassezia.*

Notre étude confirme l'impression clinique de la grande majorité des dermatologues vétérinaires, à savoir que la dermatite atopique est de loin la cause la plus fréquente de prurit chez les chiens. La prévalence remarquablement faible des affections ectoparasitaires (7,1 %) constitue une découverte intrigante. Dans l'ensemble, cette étude souligne l'importance des maladies cutanées allergiques dans la population canine suisse.

Mots clés: Atopie, dermatite atopique canine, chien, démangeaison, prurit

Studio sulla prevalenza e sui sintomi clinici delle dermatosi pruriginose nei cani in Svizzera

Si sa molto poco sulla prevalenza delle malattie pruriginose nei cani in generale e in particolare nell'Europa centrale. Pertanto, l'obiettivo di questo studio era (i) realizzare uno studio verticale di prevalenza delle malattie pruriginose nei cani e (ii) caratterizzare il segnale, la distribuzione del prurito e le infezioni secondarie dei cani atopici in Svizzera.

Diciassette veterinari in tutta la Svizzera hanno contribuito allo studio. Tutti i casi di prurito sono stati raccolti durante due mesi freddi e due caldi. In totale sono stati inclusi 743 casi. La dermatite atopica canina è stata la diagnosi più frequente in questo studio (59,1 %), seguita da otite (26,1 %), piodermite (22,6 %) ed ectoparassiti (7,1 %). Il bulldog francese, il West Highland White Terrier e l'American Staffordshire Terrier erano sovrarappresentati nel gruppo con dermatite atopica rispetto alla popolazione generale dello studio. I cani atopici di mezza età (49,9 %), di sesso maschile (58,8 %) e di peso compreso tra 10 e 25 kg (42,6 %) sono stati colpiti più frequentemente. La maggior parte dei cani con dermatite atopica (56 %) ha mostrato prurito nelle zampe, seguito da prurito nelle orecchie (48,1 %). In totale, il 54,7 % dei cani atopici ha mostrato piodermite, mentre il 31,8 % ha avuto dermatite *da Malassezia.*

Il nostro studio conferma l'impressione clinica della stragrande maggioranza dei dermatologi veterinari, secondo cui la dermatite atopica è di gran lunga la causa più frequente di prurito nei cani. Un dato interessante è la sorprendentemente bassa prevalenza delle condizioni ectoparassitarie (7,1 %). Complessivamente, questo studio evidenzia l'importanza delle malattie allergiche della pelle nella popolazione canina svizzera.

Parole chiave: atopico, dermatite atopica canina, cane, prurito

Literaturnachweis

[1] Beck W, Boch K, Mackensen H et al. (2006) Qualitative and quantitative observations on the flea population dynamics of dogs and cats in several areas of Germany. Vet Parasitol 137:130–136

[2] Bruet V, Mosca M, Briand A et al. (2022) Clinical Guidelines for the Use of Antipruritic Drugs in the Control of the Most Frequent Pruritic Skin Diseases in Dogs. Vet Sci 9

[3] Favrot C, Fischer N, Olivry T et al. (2020) Atopic dermatitis in West Highland white terriers - part I: natural history of atopic dermatitis in the first three years of life. Vet Dermatol 31:106–110

[4] Favrot C, Steffan J, Seewald W et al. (2010) A prospective study on the clinical features of chronic canine atopic dermatitis and its diagnosis. Vet Dermatol 21:23–31

[5] Griffin CE, DeBoer DJ (2001) The ACVD task force on canine atopic dermatitis (XIV): clinical manifestations of canine atopic dermatitis. Vet Immunol Immunopathol 81:255–269

[6] Hensel P, Santoro D, Favrot C et al. (2015) Canine atopic dermatitis: detailed guidelines for diagnosis and allergen identification. BMC Vet Res 11:196

[7] Hill PB, Lo A, Eden CA et al. (2006) Survey of the prevalence, diagnosis and treatment of dermatological conditions in small animals in general practice. Vet Rec 158:533–539

[8] Hillier A, Griffin CE (2001) The ACVD task force on canine atopic dermatitis (I): incidence and prevalence. Vet Immunol Immunopathol 81:147–151

[9] Jaeger K, Linek M, Power HT et al. (2010) Breed and site predispositions of dogs with atopic dermatitis: a comparison of five locations in three continents. Vet Dermatol 21:118–122

[10] Khoshnegah J, Movassaghi AR, Rad M (2013) Survey of dermatological conditions in a population of domestic dogs in Mashhad, northeast of Iran (2007–2011). Vet Res Forum 4:99–103

[11] Nuttall T, McEwan N (2006) Objective measurement of pruritus in dogs: a preliminary study using activity monitors. Vet Dermatol 17:348–351

[12] Nødtvedt A, Egenvall A, Bergvall K et al. (2006) Incidence of and risk factors for atopic dermatitis in a Swedish population of insured dogs. Vet Rec 159:241–246

[13] Pascal Prlaud and ric Guagure and Zeineb Alhaidari and NFaDHaAG (1998) Reevaluation of diagnostic criteria of canine atopic dermatitis. Revue De Medecine Veterinaire 149:1057–1064

[14] Rosser EJ (1999) Advances in the diagnosis and treatment of atopy. Vet Clin North Am Small Anim Pract 29:1437–1447

[15] Rostaher A, Dolf G, Fischer NM et al. (2020) Atopic dermatitis in a cohort of West Highland white terriers in Switzerland. Part II: estimates of early life factors and heritability. Vet Dermatol 31:276-e266

[16] Santoro D (2019) Therapies in Canine Atopic Dermatitis: An Update. Vet Clin North Am Small Anim Pract 49:9–26

[17] Saridomichelakis MN, Olivry T (2016) An update on the treatment of canine atopic dermatitis. Vet J 207:29–37

[18] Scott DW, Paradis M (1990) A survey of canine and feline skin disorders seen in a university practice: Small Animal Clinic, University of Montréal, Saint-Hyacinthe, Québec (1987–1988). Can Vet J 31:830–835

[19] Wilhem S, Kovalik M, Favrot C (2011) Breed-associated phenotypes in canine atopic dermatitis. Vet Dermatol 22:143–149

[20] Willemse T (1986) Atopic skin disease: a review and a reconsideration of diagnostic criteria. Journal of Small Animal Practice

Korrespondenzadresse

Clinic for small animal internal medicine, Vetsuisse Faculty, University of Zurich
Winterthurerstrasse 256
CH-8057 Zürich
E-Mail: derma@vetclinics.uzh.ch

A vertical study on the prevalence and clinical symptoms of canine pruritic dermatoses in Switzerland

S. Brem, L. Antoine, E. Maina, C. Favrot