

Canine atopy in Slovakia*

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Summary

A complex analysis was carried out on atopic dogs over a period of 6 years (1995-2000). The investigated group of animals was comprised of 152 dogs of 38 breeds and mongrels from different regions of Slovakia. Our investigations indicated that atopic diseases occurred in practically all breeds as well as in mongrels. The study showed that the incidence of this problem was the highest in German Shepherds (19%). Atopic diseases occurred in dogs of every age but most frequently between the 1st and 3rd year of life (62.5%) and affected more males (60.5%) than females. Allergen-diagnostics proved that the highest number of positive reactions were caused by mites, with a predominance of *Dermatophagoides farinae* (77.6%). With regard to the human allergens, the positive reactions to human epithelium were most frequent (21.7%). Among the dogs allergic to seasonal herbal allergens, 12.5% were positive to weed pollen. Positivity to only one allergen was observed in 23 (15.1%) dogs while multisensitivity to 4 allergens was detected in 27.6% of the dogs, to 3 allergens in 23.7%, and 21.1% of the dogs were positive to 2 allergens.

The incidence of atopic diseases in dogs with general dermatopathies was observed in 4.7% of the cases.

Keywords: dogs, atopy, allergens

Atopy is an inheritable disease characterised by production of IgE antibodies specific to environmental antigens, such as plant pollen, mites, epithelium, and others. Its most important clinical manifestation is pruritus with seasonal or year-around occurrence. It is an important group of canine diseases as it occupies a prominent place in the complex of allergic skin diseases (4, 7, 8, 12, 15, 17, 18, 20). The first clinical signs of disease have been observed already in the pre-pubertal stage but the majority of cases have been recorded between 1-3 up to 6 years of age (2, 3, 5). Atopic diseases were diagnosed in dogs of many breeds and also in mongrels. In Europe a breed predisposition was observed in German Shepherds, Poodles, Boxers, Terriers, English Bulldogs, Irish Setters, and Retrievers (1, 4, 10, 19). Definitive diagnosis of canine atopy made in our study was based on a complex examination and compatibility of anamnestic data, clinical symptoms of the disease, differential diagnostics, and positive intradermal skin test (PIST) or *in vitro* ELISA test. Such a procedure was recommended also by Willemse (20), Muller (9), Tan and Halliwell (16), Pomorski *et al.* (11). Of the seasonal allergens the highest incidence of positive reactions in European countries has been detected for weed pollen and also pollen of grass and trees. With regard to the number of positive reactions to non-seasonal allergens, *Dermatophagoides farinae* rated

as first followed by household dust, human epithelium and animal epithelium (2, 4, 7, 10, 17, 18).

The aim of study was to present a summary of atopic diseases in dogs in Slovakia over the years 1995-2000.

Material and Methods

The evaluated group consisted of 152 diagnosed atopic patients that were examined at the Department of Dermatology of the ^{1st} Internal Clinic of the University of Veterinary Medicine in Košice in the period of 1995-2000.

The intradermal testing was carried out using allergens of Holland origin – ARTUVETRIN TEST SET designed for diagnostics of canine atopy that contained mixed allergens of grass, trees and weeds and individual allergens of mites and epithelium.

The tests that were used to prove the suspect allergen or atopic disease were carried out according to the following scheme:

- intradermal allergen-diagnostics was carried out in patients after thorough anamnesis, clinical and laboratory examination, and differential diagnostics,

- before the testing, administration of all medicaments that could affect the results of intradermal skin tests (IDST), such as antihistaminics, corticoids, tranquilizers and other antiinflammatory and immunosuppressive preparations, were withdrawn,

- the performance and evaluation of the IDST was carried out according to then procedure recommended by the manufacturer of the diagnostic test (ARTU Biologicals N. V, Lelystad, Holland).

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Results and Discussion

The highest occurrence of atopic diseases in the group of 152 patients in relation to the breed was observed in German Shepherds (29; 19%), Poodles (14; 9%), Boxers (7; 4.6%), Cocker Spaniels (6; 4%), Terriers (6; 4%), Dalmatians (5; 3.3%), Shar-pei (5; 3.3%) and Chow-chow (5; 3.3%). High incidence was recorded also in mongrels (21; 13.8%). Additional 54 dogs belonged to other 31 breeds, about 1-3 dogs of each (Fig. 1). With regard to the sex the positivity was observed in 92 (60.5%) males and 60 (39.5%) females (Fig. 2). Investigations of the susceptibility of dogs according to the age showed that the first clinical symptoms of disease (Tab. 1) in the population of patients up to 1 year of age were observed in 31 (20.4%) dogs. As many as 95 (62.5%) patients were 1-3 years old (Figs. 3, 4) while 21 (13.8%) atopic dogs were in the 4-6 year age category and only 5 (3.3%) were older than 6 years.

Table 2 illustrates the susceptibility to allergens in the investigated group of dogs. It shows that 23 examined dogs (15.1%) tested positive to one allergen, 32 (21.1%) to two allergens, 36 (23.7%) to 3 allergens, 42 (27.6%) to 4 allergens and 13 examined patients (8.6%) were positive to 5 allergens. Four dogs (2.6%) showed positive reaction to 6 and two (1.3%) to 7 allergens.

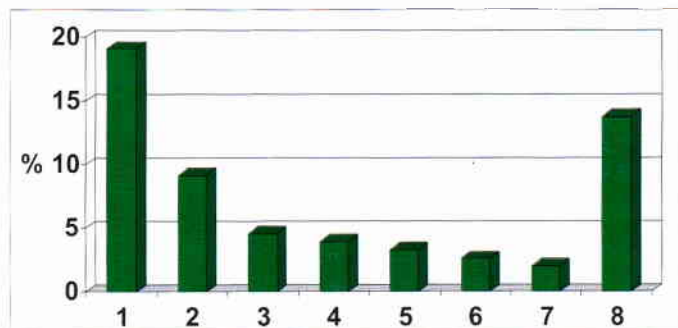


Fig. 1. Proportion of atopic dogs according to breed
 Explanation: 1 – German Shepherd; 2 – Poodle; 3 – Boxer; 4 – Cocker Spaniel, Terriers; 5 – Shar-pei, Chow-chow, Dalmatian; 6 – Maltese Dog; 7 – French Bulldog, Malamute, Schnauzer; 8 – Mongrels

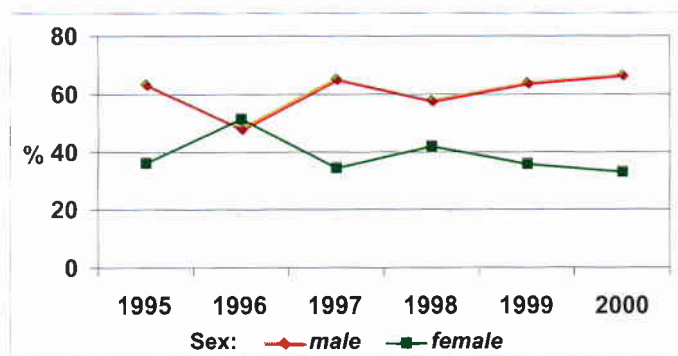


Fig. 2. Proportion of atopic dogs according to sex

Tab. 1. Proportion of atopic dogs according to age

Year	1995		1996		1997		1998		1999		2000		1995-2000	
	n*	%	n	%	n	%	n	%	n	%	n	%	n	%
< 1	4	20	6	20.7	3	11.6	3	15.8	8	32	7	21.2	31	20.4
1-3	13	65	20	69.0	20	76.9	15	78.9	11	44	16	48.5	95	62.5
4-6	3	15	3	10.3	2	7.7	1	5.3	5	20	7	21.2	21	13.8
> 6					1	3.8			1	4	3	9.1	5	3.3
Total	20		29		26		19		25		33		152	

Explanation: n* – number of dogs

Tab. 2. Multisensitivity in the tested dogs

Year	1995		1996		1997		1998		1999		2000		1995 - 2000	
	n*	%	n	%	n	%	n	%	n	%	n	%	n	%
1 allergen	6	30	5	17.2	4	15.4			3	12	5	15.2	23	15.1
2 allergens	7	35	8	27.6	3	11.5	5	26.2	5	20	4	12.1	32	21.1
3 allergens	5	25	6	20.7	10	38.5	6	31.6	5	20	4	12.1	36	23.7
4 allergens	1	5	9	31.1	7	26.9	6	31.6	10	40	9	27.3	42	27.6
5 allergens					2	7.7	1	5.3	2	8	8	24.2	13	8.6
6 allergens			1	3.4			1	5.3			2	6.1	4	2.6
7 allergens	1	5									1	3.0	2	1.3
Total	20		29		26		19		25		33		152	

Explanation: n* – number of reactions

Table 3 summarizes the number of positive allergic reactions in the examined group of atopic dogs in individual years of the period investigated. It indicates that the highest number (19 dogs) of positive reaction was observed to weed pollen which represented 12.5% of the total number of examined dogs. Grass pollen caused 15 positive reactions (9.9%), tree pollen II seven (4.6%) and tree pollen I three reactions (2%). With regard to the mites the highest incidence was observed for positive reactions caused by *Dermatophagoides farinae* that were responsi-



Fig. 3. Generalised form of atopy in a 2-year old Irish Setter with subsequent secondary seborrhoea. Alopecia with hyperpigmentation in axillae, thoracic extremities, abdomen, inguens, loins and between the legs. Dg. Atopy-hypersensitivity to weed pollen and mites (see enclosure)



Fig. 4. Interdigital erythema with pigmentation in a 3-year old American Pit-bull Terrier Dg. Atopy-hypersensitivity to mites (see enclosure)

ble for 118 cases (77.6%) while *Tyrophagus putrescentiae* rated as second (98 reactions – 64.5%). Reactions to *Acarus siro* were detected in 75 atopic dogs (49.3%) and to *Lepidoglyphus destructor* in 46 patients (30.3%). The lowest number of positive reactions (10; 6.6%) was ascribed to *Dermatophagoides pteronyssinus*.

Throughout the investigation period, epithelial allergens produced 75 positive reaction in the investigated dogs. Out of that 33 atopic dogs (21.7%) reacted to human epithelial allergens, 24 (15.8%) to cat allergens and 18 (11.8%) tested positive for epithelial allergens of dogs.

The results indicate that atopic diseases in dogs that dominate the skin allergic diseases are indeed an important group of diseases in these animals. This was confirmed by many authors (6, 8, 14, 20). The final analysis of our monitoring showed that distinctly higher incidence of positive reactions, revealed by allergen-diagnostics, was found in male dogs.

Similar conclusions were presented by Koch and Peters (5), and Magdus (7).

With regard to breed predisposition and therefore also higher incidence of atopic diseases our results showed, similar to observations by Öhlén (10), Carlotti and Costargent (2) and Hamann *et al.* (4), that the

highest incidence of atopic diseases was detected in German Shepherds. Investigation of the development of disease in relation to age, performed by Carlotti and Costargent (2), Koch and Peters (5) and Magdus (7), showed that about 70% of cases were dogs 1-3 years old and 13.8% of affected dogs were 4-6 years old. The authors mentioned observed the development of disease also in the pre-pubertal period but supplied no numbers. Of the atopic dogs subjected to our study 31 (20.4%) were less than one year old.

Allergen-diagnostics confirmed complexity of this problem and its extensive scope related to etiological aspects of the atopic disease, particularly with regard to the form of sensitivity and reaction to a number of allergens. In this direction we can support fully the data about the high percentage of multisensitivity in the patients tested, reported by Öhlén (10) and Magdus (7).

Our results concerning the reactions to seasonal plant allergens – grass and tree pollen, but also to mites and epithelium, agree quantitatively and also qualitatively with the references of a number of authors (2, 7, 13, 17).

Our monitoring proved that atopic diseases in dogs constitute health disturbances that will occur also in future and with regard to their etiology present problems that are still open and therapeutically complex.

The results of complex analysis of atopic diseases in dogs in Slovakia in the years 1995-2000, carried out in the group of 152 atopic patients, showed that the disease develops practically at any age and its incidence is considerable. It affects practically all

Tab. 3. Results of positive reactions in 152 atopic dogs

Year	1995		1996		1997		1998		1999		2000		1995-2000	
	n*	%	n	%	n	%	n	%	n	%	n	%	n	%
Grass pollen mixture	0		4	13.8	1	3.8	4	21.0	4	16	2	6.0	15	9.9
Tree pollen mixture I	0		0		1	3.8	1	5.3	0		1	3.0	3	2.0
Tree pollen mixture II	0		0		1	3.8	0		2	8	4	12.1	7	4.6
Weed pollen mixture	0		6	20.7	4	15.4	2	10.5	2	8	5	15.2	19	12.5
<i>D. farinae</i>	9	45	21	65.5	22	84.6	15	78.9	24	96	27	81.8	118	77.6
<i>T. putrescentiae</i>	5	25	18	62.0	21	80.7	15	78.9	17	68	22	66.7	98	64.5
<i>Acarus siro</i>	3	15	13	44.8	15	57.7	13	68.4	12	48	19	57.6	75	49.3
<i>L. destructor</i>	1	5	6	20.7	3	11.5	5	26.3	10	40	21	63.6	46	30.3
<i>D. pteronyssinus</i>	1	5	2	6.9	4	15.4	0	0	0	0	3	9.1	10	6.6
Dog epithelium	9	45	3	10.3	0	0	2	10.5	0	0	4	12.2	18	11.8
Cat epithelium	5	25	2	6.9	4	15.4	3	15.8	4	16	6	18.1	24	15.8
Human epithelium	13	65	6	20.7	2	7.7	3	15.8	3	12	6	18.1	33	21.7
Number of reactions	46		81		78		63		78		120		466	

breeds and also mongrels to a different degree and occurs in various forms. It is most frequent in dogs 1-3 years old (62.5%) and in German Shepherds. With regard to sex the atopic diseases predominate in male dogs (60.5% occurrence). Allergen-diagnostics showed that the highest number of positive reactions was caused by mites with predominance of *Dermatophagoides farinae* (77.6%). Of epithelial allergens, the first place was occupied by human epithelium (21.7%). The most frequent plant allergen was weed pollen which caused the highest number of positive reactions (12.5%). Considerable multisensitivity was detected in the group of observed dogs. The highest number of patients reacted to 4 allergens (27.6%), then 3 allergens (23.9%) and 21.1% of patients were sensitive to 2 allergens. Of all dogs observed only 32 (15.1%) reacted positively to only one allergen.

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