Pediatr Pract Res 2024; 12(3): 73-76
DOI: 10.21765/pprjournal.1521329

ORIGINAL ARTICLE
ORİJİNAL ARAŞTIRMA

Retrospective Evaluation of Clinical Characteristics of Children with Cat Sensitivity

Kedi Tüyü Alerjisi Olan Çocukların Klinik Özelliklerinin Retrospektif Değerlendirilmesi

Seda Çevik, Ugur Altas, Mehmet Yaşar Özkars

Department of Pediatric Allergy and Immunology, Ümraniye Training and Research Hospital, İstanbul, Turkey

ABSTRACT

Aim: Cat sensitivity holds a significant place among allergic diseases, and it is known that environmental factors as well as genetic factors affect sensitisation. It has been reported that having a cat at home increases the risk of sensitisation, especially in susceptible individuals. The aim of this study was to retrospectively evaluate the clinical features of cat sensitisation in children.

Material and Method: In this descriptive retrospective study, children aged 0-18 years with cat sensitisation who were admitted to the clinic between June 2023 and December 2023 were examined. Clinical characteristics, total IgE, eosinophil count, specific IgE values and skin prick test results were retrospectively evaluated using data obtained from the hospital database.

Results: The study included 76 children with cat sensitisation. The mean age was 7 years and 56.6% were male. The most common diagnoses were asthma (63.2%) and allergic rhinitis (31.6%). Cat sensitisation was positive in 100% of the patients, house dust mite sensitisation was found in 78.9% and pollen sensitisation in 14.5%. Total IgE levels of patients with multiple allergies were significantly higher than those without multiple allergies.

Conclusion: The study showed that additional allergen sensitisation was common in children with cat sensitisation and the most common diagnoses were allergic rhinitis and asthma. The findings are consistent with the existing literature and emphasise the importance of total IgE in the clinical management of allergic diseases.

Keywords: Cat allergy, house dust mite, pollen, allergic rhinitis

ÖZ

Amaç: Kedi alerjisi, alerjik hastalıklar arasında önemli bir yer tutmaktadır ve genetik faktörlerin yanı sıra çevresel etkenlerin de bu duyarlılığı etkilediği bilinmektedir. Evde kedi bulundurmanın, özellikle duyarlı bireylerde sensitizasyon riskini artırdığı bildirilmektedir. Bu çalışmanın amacı, çocuklarda kedi duyarlılığı olanların klinik özelliklerini retrospektif olarak değerlendirmektir.

Gereç ve Yöntem: Bu tanımlayıcı retrospektif çalışmada, Haziran 2023 - Aralık 2023 tarihleri arasında kliniğe başvuran 0-18 yaş arası kedi duyarlılığı tanısı konmuş çocuklar incelenmiştir. Hastane veritabanından elde edilen veriler kullanılarak, klinik özellikler, total IgE, eozinofil sayısı, spesifik IgE değerleri ve deri prick test sonuçları retrospektif olarak değerlendirilmiştir.

Bulgular: Çalışmaya 76 kedi duyarlılığı olan çocuk dahil edilmiştir. Ortalama yaşları 7'dir ve %56.6'sı erkektir. En sık tanılar astım (%63.2) ve alerjik rinit (%31.6) olarak belirlenmiştir. Hastaların %100'ünde kedi duyarlılığı pozitif bulunurken, %78.9'unda ev tozu akarı, %14.5'inde polen duyarlılığı saptanmıştır. Çoklu alerji olan hastaların total IgE düzeyleri, olmayanlardan anlamlı derecede yüksek bulunmuştur.

Sonuç: Çalışma, kedi duyarlılığı olan çocuklarda ek alerjen duyarlılığının sık görüldüğünü ve en yaygın tanıların alerjik rinit ve astım olduğunu göstermiştir. Bulgular, mevcut literatürle tutarlıdır ve alerjik hastalıkların klinik yönetiminde total IgE'nin önemini vurgulamaktadır.

Anahtar Kelimeler: Kedi alerjisi, ev tozu akarı, polen, alerjik rinit

Corresponding Author: Seda Çevik,
Address: Department of Pediatric Allergy and Immunology, Ümraniye Training and Research Hospital, İstanbul, Turkey
E-mail: sedgul@hotmail.com

Başvuru Tarihi/Received: 24.07.2024
Kabul Tarihi/Accepted: 29.10.2024

INTRODUCTION

Besides genetic factors, environmental factors are also considered influential in the onset of allergic diseases (1). Environmental pollutants, microorganisms, tobacco smoke, and chemicals form a specific external environment that individuals may be exposed to throughout their lives (1,2). Aeroallergens are the most commonly detected allergens in patients diagnosed with allergy (3). Studies have shown an increasing prevalence of cat sevsitivity, a type of aeroallergen sensitivity, over recent years. Symptoms of cat allergy can vary from mild rhinoconjunctivitis to severe asthma attacks and anaphylaxis (4-6). Individuals who keep cats indoors are more prone to developing sensitization. Moreover, research indicates that cat allergens adhere to individuals' clothing and can be carried into various shared environments, potentially increasing sensitization rates in these individuals (7,8). Furthermore, patients sensitized to cats have been reported to have an elevated likelihood of sensitization to other animal allergens, particularly dogs (9,10). The most recommended strategies to alleviate symptoms in patients with cat sensitivity include removing the pet from the household, minimizing contact, and administering allergen-specific immunotherapy to suitable candidates (11).

The objective of our study was to retrospectively assess the clinical characteristics of children who are sensitive to cats.

MATERIAL AND METHOD

This study is a descriptive retrospective study. It included all patients aged 0-18 years diagnosed with cat sensitivity at our clinic over a six-month period. We retrospectively evaluated clinical characteristics such as age, gender, allergic conditions (urticaria, asthma, allergic rhinitis, etc.), total IgE levels, eosinophil counts, specific IgE antibody values, and results of skin prick tests. Data were collected from the hospital database of patients who visited our pediatric allergy and immunology outpatient clinic between June 2023 and December 2023. ImmunoCAP (Thermo Fisher Scientific, Uppsala, Sweden) was used for allergen specific IgE measurements. Specific IgE levels were measured for inhaled allergens including house dust mite, cat epithelium and pollen. Specific IgE values of 0.35 kU/L or higher were considered positive. Epidermal SPT (skin prick test) was performed using allergen extracts (ALK-Abello, Madrid, Spain) with positive control (10 mg/dl histamine phosphate) and negative control (0.9% sterile saline). Horizontal and vertical measurements were made for indurations. Indurations with a mean diameter at least 3 mm larger than the negative control were considered positive. Patients undergoing SPT were tested for inhaled allergens such as house dust mite, cat epithelium, wood mixture, cockroach, alternaria and cladosporium. Patients with negative allergen-specific IgE results underwent SPT. Allergen positivity was defined as a positive result on allergen-specific IgE testing or SPT.

Statistical Analysis

Statistical analyses and data recording were performed using SPSS (Statistical Package for Social Sciences) 29.0. Descriptive statistics such as median, minimum, maximum values, number (n), and percentages (%) were used to summarize the data. The normal distribution of continuous variables was assessed both visually (histogram and probability plots) and analytically (Kolmogorov-Smirnov/Shapiro-Wilk tests). For categorical variables, Fisher's exact test was employed for statistical comparisons. The Mann-Whitney U test was used to compare two groups concerning numerical data that did not follow a normal distribution. The significance level for all statistical tests was set at $p < 0.05$.

Ethics

Ethical approval was obtained from Ümraniye Training and Research Hospital Clinical Research Ethics Committee (Date: 08/02/2024, Decision No: 33).

RESULTS

A total of 76 children with cat sensitivity were included in the study. The median age was 7 years (1-16). 56.6% (n=43) of the patients were male. A family history of atopy was present in 26.3% (n=20) of the children. The proportions of cat owners and smokers at home were 10.5% (n=8) and 11.8% (n=9), respectively. Asthma and allergic rhinitis (AR) were diagnosed in 63.2% (n=48) of the patients (**Table 1**). The median duration of cat ownership was 2 years (1-3) in the eight people who kept cats at home.

Table 1. Sociodemographic and clinical characteristics

Age (years), median (min-max)	7 (1-16)	
	n	**%**
Gender		
Female	33	43.4
Male	43	56.6
Family history of atopy		
No	56	73.7
Yes	20	26.3
Presence of cats at home		
No	68	89.5
Yes	8	10.5
Smoking exposure at home		
No	67	88.2
Yes	9	11.8
Clinical		
Asthma	1	1.3
AR	24	31.6
Asthma+AR	48	63.2
Urticaria+AR	3	3.9

AR: Allergic rhinitis, min: minimum, max: maximum

The laboratory data of the patients included in the study are given in **Table 2**. The median absolute number of eosinophils was 320 (min 0-max 520), the median percentage of eosinophils was 3.8% (min 0-max 21.1%) and the median total IgE was 267.0 IU/mL (min 3.0-max 5585.0). In terms of specific IgE positivity, cat sensitivity was found to be positive in 100% of the patients, house dust mite allergy in 78.9%, and pollen allergy in 14.5%.

Table 2. Laboratory values of patients

Laboratory values	Median (min-max)	
Eosinophil absolute count	320 (0-520) (103/uL)	
Eosinophil percentage	3.8 (0-21.1)	
Total IgE (IU/ml)	267.0 (3.0-5585.0)	
Allergen sensitisation	**n**	**%**
Cat	76	100.0
House dust	60	78.9
Pollen	11	14.5

Min: minimum, max: maximum

The presence of multiple allergies was found in 27.3% of patients with a family history of atopy, whereas this rate was 20.0% in patients without a family history of atopy (P=1.000). There was no statistically significant difference observed between patients who had a cat at home and those who did not (P=1.000) and between patients with and without smoking exposure at home (P=1.000) in terms of the presence of multiple allergies (**Table 3**).

Table 3. Presence of Multiple Allergies and Associated Risk Factors

	Presence of multiple allergies				P value
	Yes		No		
	n	%	n	%	
Family history of atopy					
No	48	72.7%	8	80.0%	1.000
Yes	18	27.3%	2	20.0%	
Cat at home					
No	59	89.4%	9	90.0%	1.000
Yes	7	10.6%	1	10.0%	
Smoking exposure at home					
No	58	87.9%	9	90.0%	1.000
Yes	8	12.1%	1	10.0%	

No statistically significant differences were found between patients with and without multiple allergy in terms of age, absolute eosinophil count and eosinophil percentage (P values 0.078, 0.208, 0.344, respectively). A statistically significant difference was found between patients with and without multiple allergy in terms of total IgE level (P=0.015) (**Table 4**).

DISCUSSION

Allergic diseases are known to be influenced by genetic and environmental factors. In our study, we investigated the prevalence of multiple allergy conditions in children with cat sensitivity and the clinical features of the patients.

In our study, 10.5% of patients with cat sensitivity kept a cat at home. According to another one-year study conducted in our clinic, 38.1% of children with cat sensitivity were found to have a cat at home (12). According to another study in the literature, it was reported that 35.0% of children sensitized to cats had a cat present in their home (13). Compared to the literature, the proportion of patients with cat sevsitivity who had a cat at home was found to be lower in our study. This suggests that exposure to cat allergens may also be possible outside the home.

In our study, house dust mite allergy was found in 78.9% and pollen allergy in 14.5% of patients with cat sensitivity. Kaya et al. found additional aeroallergen sensitisation, mostly pollen allergens, in 85% of their patients in addition to cat sensitisation (14). In another study in the literature, it was found that 93.3% of children with cat sensitivity were also allergic to house dust mites (15). This finding points to an allergic picture in which cat allergy is usually accompanied by sensitisation to other allergens, not alone. In this context, it is important to evaluate the sensitisation profile against other allergens in children with cat sensitivity in detail.

In our study, the most common clinical diagnoses in patients with cat sensitivity were allergic rhinitis and asthma, which were similar to the literature (16). Severcan et al. found that the most common symptoms in cat contact were AR (29.4%) symptoms such as runny nose, itching and sneezing (17). In our study, 31.6% had AR complaints, while 61.3% patients had

Table 4. Age and laboratory values of patients with multiple allergies

	Presence of multiple allergies						P value
	Yes			No			
	Median	Minimum	Maximum	Median	Minimum	Maximum	
Age	7.00	2.00	16.00	5.50	1.00	14.00	0.078
Eosinophil absolute count (10^3/uL)	360	0.00	520	20	0.00	270	0.208
Eosinophil percentage	3.80	0.00	16.30	2.05	0.10	21.10	0.344
Total IgE (IU/ml)	353.50	6.00	5585.00	72.00	3.00	1355.00	0.015

coexistence of asthma and AR. In the study of Severcan et al. (17), when allergen sensitisation accompanying cat allergy was analysed, 6 grass species were found in 59.8% and house dust mite in 20.3%. This may explain the coexistence of AR symptoms in the group in which pollen allergy accompanied AR symptoms most frequently, whereas in our study, asthma and AR symptoms were associated with house dust mite sensitivity most frequently.

In our study, a significant difference was found between the total IgE values of patients with multiple allergies and those without multiple allergies. This finding emphasises the importance of total IgE in allergic response in allergic diseases.

Limitations and Strengths of the Study

The findings of this study may be limited in their applicability due to its single-centre nature. Additionally, the inability to assess the clinical severity of the patients represents another significant limitation of our study. However, this study provides a detailed description of the clinical features and laboratory findings of cat sevsitivity and contributes to the literature.

CONCLUSION

Our study aimed to assess the prevalence and clinical characteristics of coexisting allergies in children with cat sensitivity. Our findings indicated that many patients allergic to cats also showed sensitivities to other allergens, such as house dust mites and pollen. Allergic rhinitis and asthma were the most frequent clinical diagnoses, aligning well with existing literature.

ETHICAL DECLARATIONS

Ethics Committee Approval: Ethical approval was obtained from Ümraniye Training and Research Hospital Clinical Research Ethics Committee (Date: 08/02/2024, Decision No: 33).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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