

Questionnaire-based Study on the Relationship between Pet-keeping and Allergic Diseases in Young Children in Japan

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ABSTRACT

Background: It is still unclear how early exposure to pets is related to the risk of developing atopy-related diseases in children. There are few reports on this pet-allergy relationship in Japan although much controversial data have been reported in Europe and the USA.

Methods: A questionnaire on pet-keeping and allergic diseases was distributed to parents of children 3–6 years of age who belonged to 4 kindergarten and 2 nursery schools in Gifu city and surrounding areas. A total of 1185 questionnaires were analyzed statistically.

Results: Bronchial asthma (11.6%), atopic dermatitis (16.5%), and allergic rhinitis (16.5%) were reported. Dogs, cats, hamsters, rabbits, and birds were kept by 21.6%, 5.5%, 10%, 1.5%, and 2.6% of all families, respectively. Indoor pets with fur resulted in a significantly higher prevalence of atopic dermatitis (OR = 1.82, 95% CI 1.26–2.63) using univariate analysis and also in multivariate logistic regression analysis. We also found a significantly higher prevalence of atopic dermatitis in subjects who started keeping dogs and/or cats indoors after 1 year of age, compared to subjects who kept neither dogs nor cats, using both univariate analysis (OR = 2.26, 95%CI 1.13–4.54) and multivariate logistic regression analysis (OR = 2.17, 95%CI 1.09–4.32).

Conclusions: We found no evidence that pet-keeping protects people from developing various allergies. Conversely, indoor pets with fur have a slightly increased prevalence of atopic dermatitis.

KEY WORDS

allergy, asthma, atopic dermatitis, cats, dogs, Japan, pet-keeping

INTRODUCTION

It is still unclear how early exposure to pets is related to the risk of developing atopy-related diseases in children. Controversial data have been published during the last several years regarding the potential harmful or favorable effects of pet exposure in households,¹⁻⁴ but to our knowledge, there are few reports on this pet-allergy relationship in Japan. Environmental risk factors for allergy in Japan might be different to some extent from those in the USA and Europe since some Japanese customs are different from those in Europe and the USA. For example, the

Japanese usually take off their shoes before entering the house and use "tatami" mats on the floors. Another example is that mite allergen levels tend to be low and cat ownership rates are very high in Scandinavia where much of the work on pet allergen exposure has been done.⁵ Hence the results of studies conducted in other countries, where the customs and the climate are quite different, may not apply to Japan. Recently, however, pet-keeping, especially dogs in the house, has become more common in Japan. We herein report a questionnaire-based cross-sectional study on pet-keeping and children's allergies.

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Table 1 Relationship of variables to prevalence of allergy, BA, and AD

Variables			Allergy* ¹	BA* ²	AD* ³
SEX					
	Female	(n = 566)	32.5%	7.8%	13.6%
	Male	(n = 608)	42.3%	15.1%	18.8%
FAMILIAL HISTORY OF ALLERGY					
	paternal allergic history	No (n = 601) Yes (n = 584)	30.3% 45.0%	9.8% 13.4%	13.8% 19.2%
	maternal allergic history	No (n = 550) Yes (n = 635)	26.0% 47.6%	8.5% 14.2%	11.6% 20.6%
	parental allergic history	No (n = 331) Yes (n = 854)	22.4% 43.4%	8.5% 12.8%	9.7% 19.1%
	BA or AD in a parent	No (n = 903) Yes (n = 282)	31.5% 57.1%	8.9% 20.2%	12.3% 29.8%
SMOKING \geq 1 cigarette per day					
	any family member	No (n = 481) Yes (n = 667)	35.8% 39.1%	8.5% 13.8%	15.8% 16.9%
KEEPING F-PETS					
	no pets	(n = 788)	36.1%	11.2%	14.3%
	indoor	(n = 228)	40.4%	12.3%	23.2%
	outdoor	(n = 140)	37.9%	11.4%	16.4%
DOGS					
	no dog	(n = 928)	37.0%	11.0%	15.9%
	one dog	(n = 241)	39.8%	14.1%	17.8%
	two or more dogs	(n = 16)	37.5%	6.3%	25.0%
	indoor	(n = 99)	41.4%	17.2%	21.2%
	outdoor	(n = 158)	38.6%	11.4%	16.5%
	in the 1st year of age	No (n = 1017) Yes (n = 165)	37.6% 38.2%	11.3% 13.3%	16.5% 16.4%
CATS					
	no cat	(n = 1118)	37.1%	11.2%	16.2%
	indoor	(n = 53)	47.2%	17.0%	24.5%
	outdoor	(n = 14)	35.7%	21.4%	7.1%
	in the 1st year of age	No (n = 1136) Yes (n = 47)	37.4% 40.4%	11.5% 12.8%	16.2% 21.3%
HAMSTERS					
	no hamster	(n = 1067)	36.8%	11.4%	15.5%
	indoor	(n = 115)	42.6%	12.2%	25.2%
	in the 1st year of age	No (n = 1182) Yes (n = 14)	37.4% 42.9%	11.5% 7.1%	16.4% 42.9%

*¹Allergy includes bronchial asthma, atopic dermatitis, allergic rhinitis, food allergy, and/or urticaria*²BA, bronchial asthma; *³AD, atopic dermatitis

METHODS

STUDY DESIGN AND SUBJECTS

This was a cross-sectional population-based study. A questionnaire on pets and allergic diseases was distributed to parents of children 3–6 years of age who belonged to 4 kindergarten and 2 nursery schools in

Gifu city and surrounding areas in July 2003. The questionnaires were sent to 1405 persons and 1185 of them were returned for analysis. Pets were analyzed as to whether they were kept outdoors or indoors.

Statistical Analysis

We used the odds ratio (OR) to quantify exposure re-

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