

LETTERS TO THE EDITOR

doi:10.1093/occmed/kqu077

Sensitization to pets in pet shop workers

Dear Sir,

We read with interest the article from Yilmaz *et al.* [1] showing a low rate of allergic sensitization to common pets (cats and dogs) in pet shop workers in Ankara, Turkey. The authors concluded ‘Our findings show that cat/dog allergen sensitivity was lower than expected in pet shop workers, whereas work-related symptoms were frequent . . . pet sensitization in the work-place is a more complex issue related not just to work-place allergen exposure.’ We wish to emphasize that the results of Yilmaz *et al.* are not ‘unexpected’ and that we cannot consider ‘bias’, the high degree of pet exposure at home in the comparable study of Restrom *et al.* [2]. In fact, a high rate of common and exotic pets is frequent in all Western countries [3]. Therefore, it is common to find relatively high amounts of pet allergens in private and public places (e.g. schools, offices, means of transport etc.), where cats/dogs cannot normally enter. The higher the pet ownership in a given community, the higher the presence of pet allergens in apparently pet-free spaces [4]. Clothing and other items have been demonstrated to transfer pet allergens in pet-free indoor environments [5,6]. As shown previously, these pet-free but pet-allergen-contaminated indoor environments are able to induce allergic sensitization in susceptible individuals and trigger respiratory symptoms in already highly sensitized subjects [7]. In fact, in these contaminated environments, especially schools, the amounts of pet allergens are higher than the threshold values generally recognized necessary to induce sensitization or trigger respiratory symptoms (1 µg and 8–10 µg of allergen/g of dust, respectively) [8]. In westernized countries, this exposure to relevant amounts of pet allergens constitutes a persistent stimulation of airways and an increased risk of inducing allergic sensitization, directly as well as by a cross-reaction mechanism involving albumins and lipocalins [9]. In the Naples area, with significant pet ownership, allergic sensitization to common pets and other animals is also found in subjects without direct animal contact [10]. We have recently shown that allergic sensitization to pets (cats/dogs) increases the risk of developing sensitization to other furry animals by ~14 times [11]. This might be due to a predisposition (a possible allergic phenotype) to develop multiple sensitization to animal allergens [11]. In the article of Yilmaz *et al.*, pet workers had a non-significant previous pet exposure due to the low amount or absence of these allergens at home and elsewhere because of a low pet-ownership in their

community. Moreover, exposure in the workplace was minimized by the optimal local hygiene (good ventilation rate and cleaning). In conclusion, the findings of Yilmaz *et al.* are in agreement with the particular local conditions, but they cannot be generalized to more westernized countries with a higher basal risk of allergic sensitization. In this situation, there is a high rate of triggering respiratory symptoms in pet-sensitized individuals when they undertake work activities in pet shops.

Gennaro Liccardi

Department of Chest Diseases,
Division of Pneumology and Allergology,
High Speciality ‘A. Cardarelli’ Hospital, Naples, Italy
e-mail: gennaro.liccardi@tin.it

Gundi Steinhilber

Division of Pneumology,
Spedali Civili di Brescia, Brescia, Italy

Antonio Meriggi

Allergy and Immunology Unit,
Fondazione ‘Salvatore Maugeri’, Institute of Research
and Care, Scientific Institute, Pavia, Italy

Carmine Sapiro

Consultant in Preventive Medicine,
‘Federico II’ University, Naples, Italy

Gennaro D’Amato

Department of Chest Diseases,
Division of Pneumology and Allergology,
High Speciality ‘A. Cardarelli’ Hospital, Naples, Italy

References

1. Yilmaz I, Oner Erkeköl F, Secil D, Misirligil Z, Mungan D. Cat and dog sensitization in pet shop workers. *Occup Med (Lond)* 2013;**63**:563–567.
2. Renström A, Olsson M, Hedrén M, Johansson SG, van Hage M. Pet shop workers: exposure, sensitization, and work-related symptoms. *Allergy* 2011;**66**:1081–1087.
3. Liccardi G, Cazzola M, Canonica GW, Passalacqua G, D’Amato G. New insights in allergen avoidance measures for mite and pet sensitized patients. A critical appraisal. *Respir Med* 2005;**99**:1363–1376.
4. Heinrich J, Bedada GB, Zock JP *et al.* Cat allergen level: its determinants and relationship to specific IgE to cat across European centers. *J Allergy Clin Immunol* 2006;**118**:674–681.
5. D’Amato G, Liccardi G, Russo M, Barber D, D’Amato M, Carreira J. Clothing is a carrier of cat allergens. *J Allergy Clin Immunol* 1997;**99**:577–578.
6. Liccardi G, Barber D, Russo M, D’Amato M, D’Amato G. Human hair: an unexpected source of cat allergen exposure. *Int Arch Allergy Immunol* 2005;**137**:141–144.

7. Munir AK, Einarsson R, Schou C, Dreborg SK. Allergens in school dust. I. The amount of the major cat (Fel d I) and dog (Can f I) allergens in dust from Swedish schools is high enough to probably cause perennial symptoms in most children with asthma who are sensitized to cat and dog. *J Allergy Clin Immunol* 1993;**91**:1067–1074.
8. Chapman MD, Wood RA. The role and remediation of animal allergens in allergic diseases. *J Allergy Clin Immunol* 2001;**107**:S414–S421.
9. Liccardi G, Asero R, D'Amato M, D'Amato G. Role of sensitization to mammalian serum albumin in allergic disease. *Curr Allergy Asthma Rep* 2011;**11**:421–426.
10. Liccardi G, Salzillo A, Piccolo A, Russo M, D'Amato G. Sensitization to furry animals in an urban atopic population living in Naples, Italy. *Allergy* 2011;**66**:1500–1501.
11. Liccardi G, Passalacqua G, Salzillo A *et al*. Is sensitization to furry animals an independent allergic phenotype in nonoccupationally exposed individuals? *J Investig Allergol Clin Immunol* 2011;**21**:137–141.

doi: 10.1093/occmed/kqu078

Reply

We would like to thank Liccardi *et al.* for their comments and interest in our work.

As we mentioned in our publication, very little is known about the prevalence of allergic symptoms and the atopic status of pet shop workers. The unique study of Renström *et al.* [1] demonstrated that a large number of pet shop workers had respiratory symptoms and about a third were sensitized to allergens found in the pet shops. However, as in all Western countries, this population had a near lifelong history of exposure to pet allergens at home and in public places due to the high pet ownership in the community and the high pet sensitization rates found in this study cannot be attributed to only workplace exposure [2–7]. That is why we mentioned bias in Renström's study.

On the other hand, in Turkey, pet shop workers have a non-significant pet exposure out of work due to the low pet ownership in our country. We thought that this situation could be an advantage while investigating the relation between pet sensitization rates and work exposure. In our study, pet shop workers reported frequent work-related symptoms despite low pet sensitization rates. Work-related symptoms were explained by exposure to other allergens and non-specific irritants in the workplace in our discussion section. We are in agreement with Liccardi *et al.* that the low pet sensitization rates found in our study were related to the low amount or absence of these allergens at home and in pet shops. We also agree with the idea that our results cannot be

generalized, especially to countries with different pet owning habits; so, in the key points of the manuscript, we emphasized the idea that 'sensitivity to cats and dogs among pet shop workers might vary in different populations'.

Insu Yilmaz

Department of Chest Diseases,
Division of Immunology and Allergy
Ankara University School of Medicine
Ankara 06100, Turkey
e-mail: insu2004@yahoo.com

Ferda Oner Erkeköl

Immunology and Allergy Clinic,
Atatürk Chest Diseases & Thoracic Surgery
Training and Research Hospital
Ankara 06280, Turkey

Derya Secil, Zeynep Misirligil and Dilsad Mungan

Department of Chest Diseases,
Division of Immunology and Allergy
Ankara University School of Medicine
Ankara 06100, Turkey

References

1. Renström A, Olsson M, Hedrén M, Johansson SG, van Hage M. Pet shop workers: exposure, sensitization, and work-related symptoms. *Allergy* 2011;**66**:1081–1087.
2. Munir AK, Einarsson R, Schou C, Dreborg SK. Allergens in school dust. I. The amount of the major cat (Fel d I) and dog (Can f I) allergens in dust from Swedish schools is high enough to probably cause perennial symptoms in most children with asthma who are sensitized to cat and dog. *J Allergy Clin Immunol* 1993;**91**:1067–1074.
3. Berge M, Munir AK, Dreborg S. Concentrations of cat (Fel d1), dog (Can f1) and mite (Der f1 and Der p1) allergens in the clothing and school environment of Swedish schoolchildren with and without pets at home. *Pediatr Allergy Immunol* 1998;**9**:25–30.
4. Custovic A, Simpson B, Simpson A, Hallam C, Craven M, Woodcock A. Relationship between mite, cat, and dog allergens in reservoir dust and ambient air. *Allergy* 1999;**54**:612–616.
5. Custis NJ, Woodfolk JA, Vaughan JW, Platts-Mills TA. Quantitative measurement of airborne allergens from dust mites, dogs, and cats using an ion-charging device. *Clin Exp Allergy* 2003;**33**:986–991.
6. Liccardi G, Barber D, Russo M, D'Amato M, D'Amato G. Human hair: an unexpected source of cat allergen exposure. *Int Arch Allergy Immunol* 2005;**137**:141–144.
7. Liccardi G, Salzillo A, Piccolo A, Russo M, D'Amato G. Sensitization to furry animals in an urban atopic population living in Naples, Italy. *Allergy* 2011;**66**:1500–1501.