

Letter to the editor

Is the risk of developing atopic sensitization and bronchial asthma in animal laboratory workers preventable in well-defined susceptible individuals?

Gennaro Liccardi^{1,2}, Luigino Calzetta³,
Annalina Barrile³, Federica Maria Giorgino³,
Carmine Sapio⁴ and Paola Rogliani^{2,3}

¹Department of Pulmonology, Haematology and Oncology, Division of Pneumology and Allergology, High Speciality “A. Cardarelli” Hospital, Naples, Italy, ²Postgraduate School of Respiratory Medicine, Department of Systems Medicine, University of Rome “Tor Vergata”, Rome, Italy, ³Department of Systems Medicine, University of Rome “Tor Vergata”, Rome, Italy and ⁴Consultant in Preventive Medicine, Federico II University, Naples, Italy

(J Occup Health 2017; 59: 310-311)
doi: 10.1539/joh.17-0025-LTE

Key words: Allergic rhinitis, Allergic sensitization, Bronchial asthma, Hypersensitivity, Laboratory animals, Occupational asthma

To the editor

We have read the excellent study conducted by Simoneti et al.¹⁾ with considerable interest, which shows that laboratory animal (LA) exposure was associated with atopic sensitization. With regard to this, we would like to disagree on the modalities to collect data on “pet ownership” and provide some suggestions on the possible “preventive aspects” of allergic sensitization to LA based on our clinical and scientific experiences.

It is indubitable that the presence of a persistent exposure to LA increases the amounts of allergens reaching the airways and, consequently, the risk of developing allergic sensitization and bronchial asthma. However, only this aspect should not be considered as the exclusive risk factor for the development of occupational asthma to LA.

Received January 23, 2017; Accepted January 31, 2017

Published online in J-STAGE March 3, 2017

Correspondence to: G. Liccardi, MD, Department of Pulmonology, Haematology and Oncology, Division of Pneumology and Allergology, High Speciality “A. Cardarelli” Hospital, Piazzetta Arenella no. 7, 80128 Naples, Italy, Postgraduate School of Respiratory Medicine, Department of Systems Medicine, University of Rome “Tor Vergata”, Rome, Italy (e-mail: gennaro.liccardi@tin.it)

The query on pet ownership “Are there animals at home?” is common and usually done when collecting anamnestic data. This prevalent modality to consider exposure to pet allergens could constitute a potential bias in epidemiological studies and in clinical practice for an objective evaluation of the clinical significance of the skin prick test (SPT) positivity to common pets (cat/dog)²⁾. Pet allergens should be considered as ubiquitous because they are found in indoor private or public places where cats/dogs have been never kept.

In a study involving 723 patients sensitized to cats/dogs, 49.92% of patients reported direct pet contact, but only 29.46% were pet owners (pets at home) while 20.19% were directly exposed to pets in other settings. The remaining individuals were sensitized because their previous pet ownership (20.75%) or because they were indirectly exposed to pet allergens through pet-contaminated items (e.g. clothes of pet owners). Only 15.35% of our patients reported no apparent direct or indirect contact with pets. Therefore, only 29.46% patients could be classified as “exposed to pets” and 70.54% as “not exposed” according to the usual query. Our classification has shown that a significant percentage of “not-exposed” patients (55.19%) are instead “really exposed” (Liccardi G. unpublished data). Moreover, using *in vivo* (SPT)³⁾ and *in vitro* (micro-array technique immunoCAP ISAC)⁴⁾ methods, we have shown that exposure and allergic sensitization to common pets greatly increase the risk of developing sensitization to other furry animals probably for the presence of cross-reacting allergens (e.g., albumins and lipocalins).

In other words, it is likely that a consistent number of patients in the study by Simoneti et al. were already sensitized to epithelial allergens through previously reported mechanisms before occupational exposure to LA.

Based on this background, the key question is “How can we estimate the risk of sensitization to LA in patients already sensitized to cats/dogs or in those exposed to furry animals who wish to come into contact with animals in laboratory settings?” We suggest a possible diagnostic flow-chart in Fig. 1.

In conclusion, there is no doubt that a persistent exposure to LA can induce respiratory symptoms in sensitized patients. It is also important to underline that allergic sensitization without direct animal exposure is a potential risk for patients because they are often unaware of this. The above-mentioned aspect should be considered by susceptible individuals before starting to contact with LA for working reasons. SPTs and/or evaluation of specific IgE to LA should also be highly recommended in these individuals to identify the occurrence of allergic sensitization

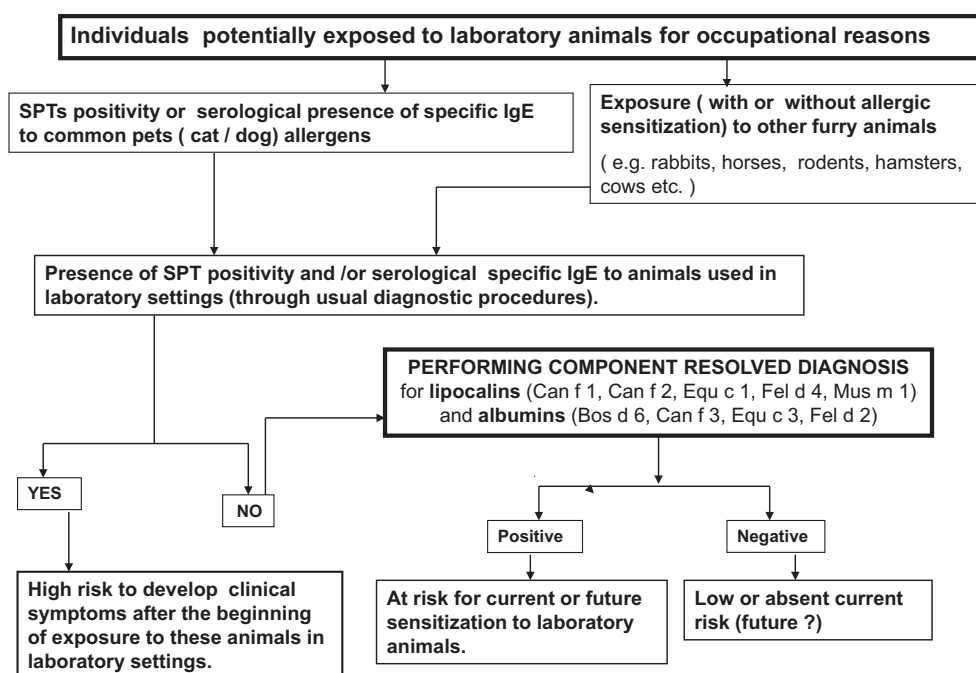


Fig. 1. Possible flow-chart to evaluate the risk of developing allergic sensitization to laboratory animals (LA) in susceptible individuals who wish to work in laboratory settings.

and, consequently, to avoid (or control) future exposure. In this context, an evaluation of specific IgE using the micro-array technique [Component Resolved Diagnosis (CDR)] for lipocalins (Can f 1, Can f 2, Equ c 1, Fel d 4, Mus m 1) and albumins (Bos d 6, Can f 3, Equ c 3, Fel d 2) may be quite useful to evaluate the possibility of cross-reactions between allergens of different animals⁵⁾.

Conflict of interest and financial resources: All authors declare that they have no conflict of interest and that the study has been conducted without any financial support.

References

- 1) Simoneti CS, Freitas AS, Rodrigues Barbosa MC, et al. Study of risk factors for atopic sensitization, asthma, and bronchial hyperresponsiveness in animal laboratory workers. *J Occup Health* 2016; 58: 7-15.
- 2) Liccardi G, Salzillo A, Calzetta L, Piccolo A, Rogliani P. Assessment of pet exposure by questionnaires in epidemiological studies (but also in clinical practice!): why the questions

should be simplified? *J Asthma* 2016; 53: 879-881.

- 3) 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.
- 4) Liccardi G, Meriggi A, Russo M, Croce S, Salzillo A, Pignatti P. The risk of sensitization to furry animals in patients already sensitized to cat/dog: An *in vitro* evaluation using molecular-based allergy diagnostics. *J Allergy Clin Immunol* 2015; 135: 1664-1666.
- 5) Liccardi G, Bilò MB, Manzi F, et al. What could be the role of molecular-based allergy diagnostics in detecting the risk of developing allergic sensitization to furry animals? *Eur Ann Allergy Clin Immunol* 2015; 47: 163-167.

Journal of Occupational Health is an Open Access article distributed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. To view the details of this license, please visit (<https://creativecommons.org/licenses/by-nc-sa/4.0/>).