



Correspondence

Occupational exposure to furry animals and asthma

The complex interconnection between work and everyday life



We read with interest the excellent review by Dao and Bernstein¹ on the association between exposure to occupational agents and asthma. We would like to add some considerations, especially from a preventive point of view, on the section concerning the exposure to furry animals in certain classic settings, such as laboratories and farms. We believe that, in many cases, the border between occupational and daily exposure to epithelial products of furry animals may be very subtle. In the field of animal care, besides the veterinarians, several emerging professional activities have become common in recent years (ie, groomers, pet sitters, pet trainers).

Actually, it is been widely recognized that cat and dog allergens should be considered ubiquitous because they are found not only in indoor environments in which these animals live but also in other indoor private and public places where cats and dogs have been never kept.^{2,3} As a result, pet allergen ubiquity represents a persistent stimulation of airways similar to that induced by dust mite. This indirect modality of exposure is likely to be involved for other animals as well. Therefore, it is reasonable to assume that individuals who are highly sensitized to pet allergens as a consequence of direct or indirect exposure should be at higher risk of occupational asthma after beginning to work with any furry animals. In this case, a possible explanation for allergic sensitization could be a cross-reaction mechanism that involves allergenic proteins, such as lipocalins and albumins.^{4,5} Moreover, we found, by using *in vivo* (skin prick test) and *in vitro* models (the microarray technique ImmunoCAP ISAC), that exposure and allergic sensitization to common pets may increase the risk of developing sensitization to other furry animals.^{6,7}

Zeidler et al⁸ demonstrated, using high-resolution computed tomography of the chest, that naturalistic exposure to cat allergen may result in significant small airways obstruction and hyperresponsiveness that persists for at least 23 hours. Further evidence suggests that a certain percentage of epithelial or urinary allergens of other animals (ie, rat) could be of submicronic size and thus able to reach small peripheral airways.⁹

Considering this background, we suggest the integration of the usual diagnostic approach in already animal-exposed workers or in those who want to work with furry animals. Collecting information on direct or indirect exposures in everyday life and the use of ImmunoCAP ISAC are essential to verify the presence of concomitant allergic sensitization to lipocalins and/or albumins.¹⁰ In some more complex cases, the use of high-resolution computed tomography of the chest could be useful to demonstrate the presence of air trapping in small airways.

In conclusion, we believe that a well-defined diagnosis of occupational asthma to animal allergens is unlikely to be performed if we consider the ubiquity of pet allergens and the presence of cross-reactive allergens in furry animals. Our suggested diagnostic integrations could be useful for a real evaluation of respiratory conditions in occupied individuals and the level of risk in candidate animal workers.

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Authors' response



We thank Liccardi et al for their interest in our article and for raising the issue of prior pet sensitization as a risk factor for developing occupational asthma.¹ Another study found that a prior history of pet ownership and sensitization was associated with an increased risk of work-related asthma in animal shelter workers.² Thus, in those workers exposed to pet allergens at home and at work, the peak flow monitoring protocol described in our stepwise diagnostic approach would not always be useful in distinguishing between work-related and non-work-related asthma. We are aware of studies reporting higher frequencies of mouse and horse sensitization among cat and dog allergic subjects, but a clear association between pet allergy and work-related asthma has not been demonstrated. Without knowledge of the predictive value of pet allergen sensitization for development of work-related asthma, we cannot recommend routine pet allergen testing for animal workers. Second, the utility of testing for animal cross-reactivity is unclear because it is not yet fully understood. Cross-sectional studies have shown that IgE specific for lipocalins Equ c 1 and Mus m 1 occurred in those subjects who were also sensitized to cats and or dogs,^{3–5} but longitudinal studies are needed to provide a more definitive association before this information can be integrated into clinical practice. Finally, one must be cautious in prescreening workers for sensitization to workplace allergens, because this

might violate disability laws if used to determine employment or placement decisions.⁶

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