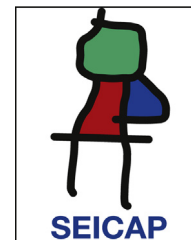


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LETTER TO THE EDITOR

**Is generalized reaction after
exposure to big cats at the
circus really unpredictable in
highly cat-allergic individuals?**

To the Editor,

We read with interest the article from Feleszko et al.¹ showing a generalized allergic reaction in a 8-year-old boy, sensitized only to cat dander, few minutes after the beginning of a lion show at the circus. The authors stated in the title "Unexpected cross-reactivity in a cat-allergic patient..." and emphasized the risk that individuals sensitized to cat in domestic setting could develop severe allergic reaction after the exposure to other animals in different settings.

Although the warning appears to be appropriate, we wish to underline some crucial aspects showing that this risk is absolutely to be "expected" in the circus setting.

First of all, as stated above, a cross-reactivity in the circumstances reported in this case cannot be considered as "unexpected". In fact, after the article of de Groot et al. on a Fel d 1-like molecule found in big cats reported by Feleszko et al., more recent studies have shown the presence of another allergen (a lipocalin) which can explain a cross-reactivity between cat/dog/other animals.^{2,3} Moreover, since several mammals live and "work" in a circus, it is likely that high amounts of lipocalins as well as albumins,⁴ typical mammals allergens, derived from these animals are present in that environment.

The size of animals involved in this case-report might play an important role as "predictable" risk factor for generalized allergic reactions in individuals already sensitized to cat allergens. The weight of a lion fluctuates between a minimum of 120kg in female and a peak of 250kg in male lion whereas a common cat weighs about 4–5 kg, as a consequence it is likely that the production of allergen in lions (and its clinical effects) will be of bigger size.

An evaluation of specific IgE by using the microarray technique ImmunoCAP ISAC (ThermoFisher Scientific – Immuno-Diagnostics, Sweden) 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) would have been very useful to evaluate

the possibility of cross-reactions between the allergens of different animals in this patient.

Secondly, authors state "Current recommendations to control allergic symptoms in cat allergic patients... do not include any restrictions of contact with big cats in places like Wild Parks, Zoos or circus visits", this is true because reported recommendations refer exclusively on control measures in domestic environments. Moreover, the references reported in the article were published a few years ago when some more recent discoveries on animal allergens have not yet been published.

We have recently shown that exposure and allergic sensitization to common pets (cats/dogs) increases of about fourteen times the risk of developing sensitization to other furry animals.⁵ This might be due to a possible predisposition to develop multiple sensitization to animal allergens (allergic phenotype?).⁵

A likely explanation for this high prevalence of mammals sensitization in subjects apparently without known contact with animals can be indirect exposure (through transport of animal allergens by the clothes or other items of animal owners into animal-free environments) or a cross-allergic reaction as previously reported.⁶ These issues are extremely important in real life and constitute a relevant risk for animal-sensitized patients because they are not aware about the possibility of inducing respiratory symptoms after occasional exposure to animals.

In conclusion, the abovementioned considerations suggest that a generalized allergic reaction occurred in a patient highly sensitized to cat allergens during a big cats exhibition at the circus cannot be considered "unexpected" but certainly "predictable" either for cross-reactivity with big cats allergens or for allergens of other animals living at circus. In several occasions we have suggested that individuals already sensitized to common pets should perform SPTs/evaluation of specific IgE antibodies also to less common mammalian allergens to identify the occurrence of allergic sensitization and consequently to avoid future exposures to these animal allergens also in different settings such as pet shows, farms, wild parks or zoos.

Authorship

All authors contributed equally in the writing and revision of the manuscript.

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Ethical disclosures

Confidentiality of data. The authors declare that no patient data appears in this article.

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this investigation.

Conflict of interest

All authors declare that they have no conflict of interest and that the study has been carried out without any financial support.

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- G. Liccardi^{a,*}, A. Salzillo^a, G. Steinhilber^b, A. Meriggi^c, A. Piccolo^a, G. D'Amato^a
- ^a *Department of Chest Diseases, Division of Pneumology and Allergology, High Speciality "A. Cardarelli" Hospital, Naples, Italy*
^b *Division of Pneumology, Spedali Civili di Brescia, Brescia, Italy*
^c *Allergy and Immunology Unit, Fondazione "Salvatore Maugeri", Institute of Research and Care, Scientific Institute of Pavia, Italy*
- * Corresponding author.
E-mail address: gennaro.liccardi@tin.it (G. Liccardi)