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LETTER TO EDITORS

(AUGUST 17, 2015)

OCCUPATIONAL ALLERGY TO HORSE ALLERGENS: MORE THAN EXPOSURE TO HORSES!

Dear Editor,

We read with interest the article from Moghtaderi et al. [1] showing that exposure to horses among individuals who ride enhances the risk of developing allergic sensitization to horse allergens in comparison to healthy controls.

The topic is of high importance considering the popularity of a horse as a domestic animal for several reasons (work, leisure, pet therapy, etc.), and the relatively scarcity of data on horse-induced allergic sensitization. However, in our opinion, serious limitations to the conclusions of this research have not been included in the list of possible limitations already acknowledged by the authors.

First of all, the authors don't provide any information on the type of contact of horse-riders and healthy controls with common pets such as cats and dogs (Ownership? Indirect exposure? No apparent contact?). The frequency of ownership and the prevalence of allergic sensitization to cats/dogs vary in different countries according to cultural differences and environmental factors.

Moreover, it has been widely recognized that cat and dog allergens should be considered as ubiquitous since they are found not only in indoor environments containing those animals but also in other indoor private/public places where cats/dogs have never been kept [2]. The consequence of pet allergen ubiquity is a persistent stimulation of airways similar to that induced by dust mite. This indirect modality of exposure (through clothes or other items) [3,4] is likely to be involved also for other furry animals, including horses [5]. Another important aspect is that allergic sensitization to furry animals may be induced not only by direct/indirect exposure but also by a cross-reaction mechanism involving some families of allergenic proteins. Lipocalins constitute the most important group of mammalian inhalant allergens because they are the major allergenic materials derived from a dog (Can f 1-2), cattle (Bos d 2), a horse (Equ c 1), a rat (Rat n 1), a mouse (Mus m 1), a guinea pig (Cav p 1), a rabbit (Ory c 1), and a hamster (Pho s 21) [6]. Some lipocalins show a very low amino acid identity whereas others – greater homologies and immunoglobulin E (IgE) cross-reactivity (47–67%), such as Fel d 4, Can f 6, Equ c 1, Ory c 4, Mus m 1, and Rat n 1. It has been shown that mammalian serum albumins are also involved in some clinical conditions, such as anaphylactic reactions after artificial insemination, episodes of food allergy and asthmatic reactions [7]. In our geographical area (Naples, Italy), only about 50% of atopic patients sensitized to common pets (cats/dogs) are directly exposed to those animals whereas the other half is indirectly exposed or not exposed. If we consider allergic sensitization and modalities of exposure to other furry animals, such as rabbits, hamsters, rats, horses, cows, guinea pigs and mice, the percentage rate of sensitized individuals exposed directly to those animals ranges between 0–33.3% whereas the percentage rate of the patients sensitized to the same animals with indirect or no contact ranges between 66.7–100% [8].

Finally, we have shown, by using an *in vivo* model (skin prick test), that exposure and allergic sensitization to common pets increase the risk of developing sensitization to other furry animals (including horses) by about 14-fold, suggesting a possible predisposition to develop multiple

sensitization to animal allergens [9]. Recently, we have confirmed this finding also by using an *in vitro* model (the micro-array technique ImmunoCAP ISAC, Thermofisher Scientific – Immuno-Diagnostics, Sweden), in the case of 741 subjects sensitized or not to pet allergens, because of the presence of lipocalins [10]. Unfortunately, this last diagnostic approach has not been performed, in the study of Moghtaderi et al., at least among individuals with a suspected horse-induced occupational allergy.

In conclusion:

1. The lack of information about the exposure to common pets among examined patients does not allow to establish the potential risk of developing allergic sensitization to a horse, also in the absence of horse contact. In other words, it is likely that a significant percentage rate of horse-rider patients could have developed allergic sensitization to horse allergens as the only consequence of lipocalin-cross reactivity but not as a consequence of an occupational allergy.
2. The lack of using the Component Resolved Diagnosis (ImmunoCAP ISAC) does not allow to evaluate the presence of specific IgE to some families of allergenic animal proteins which share significant cross-reactivity. This finding is very useful to confirm the suspicion of occupational allergy to horse.
3. The data discussed here suggests that several different factors may induce allergic sensitization to furry animals with or without previous contact. This aspect should be taken into account by susceptible individuals before any contact with any animal, including a horse for working/leisure activity purposes [11,12]. The skin prick test and/or evaluation of specific IgE antibodies to a horse should be recommended for individuals already sensitized to common pets to identify the occurrence of allergic sensitization and consequently to avoid any kind of contact with a horse. In this context an evaluation of specific IgE by using the micro-array technique 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) might be very useful to evaluate the possibility of cross-reactions between allergens of different animals [13]. These suggestions might contribute to prevent allergic sensitization to a horse other than the measures indicated by authors for individuals who have already become horse riders.

Key words:
Bronchial asthma, Horse, Horse allergy, Hypersensitivity, Occupational allergy, Occupational asthma

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