

Letter to the editor

Re: Exposure to furry pets and the risk of asthma and allergic rhinitis: a meta-analysis

In the July 2008 issue of *Allergy*, a meta-analysis reported 'exposure to cats exerts a slight preventive effect on asthma, an effect that is more pronounced in cohort studies' (1). Current knowledge on the effect of furry pet exposure on the development of allergic diseases is disputed. It is an impressive attempt to perform a meta-analysis to summarize quantitatively published results after 1990 which are so far conflicting and controversial. The authors used strict guidelines and adequately evaluated heterogeneity between studies and publication bias. However, we observed flaws.

The exposure and health outcome definitions are ill-defined in the article. The authors pooled the reported effect estimates regardless of how 'cat exposure' was defined. In the meta-analysis, exposure to domestic cat allergen (2), cat allergen level from classrooms (3) and cat ownership (4) were not distinguished between. It is known that cat allergen is ubiquitous, while in some studies, non-cat-owners are considered as non-exposed group; in the study which assesses the effect of cat allergen exposure from classrooms, non-cat owners would be assigned to have the same amount of cat allergen exposure as the cat owners from the same class. The scales of the effect of cat allergens exposure at different periods of life from different environments may vary strongly. It has been speculated that the crucial time windows of allergen exposure are in utero and in the first year of life, while the

immune system develops and a shift of Th2-dominated immune response to a Th1-mediated reaction takes place. It is questionable to pool the effect of early childhood exposure (5) to cat allergen and the effect of exposure from later age (4). Furthermore, for older children, who are non-cat-owners, school and homes of friends and relatives are likely to be the major sources of cat allergen exposure and regular contact with cats outside the domestic area is therefore likely to have an impact on the development of allergic disorders in school-age children (6).

The diverse health outcome definitions of the studies included in the meta-analysis are also inadequate. In the meta-analysis, the author pooled the effect estimates for incidence of asthma and doctor diagnosed 'current asthma' evaluated at 4–28 years of age, but completely neglected the different clinical interpretations of the different outcomes.

Some of the extracted effect estimates listed in the meta-analysis cannot be found in the original article. For example, Smedje et al. reported that per 10 ng increase in amount of cat allergen exposure from classroom increases the odds of asthma incidents to 1.4 [C.I. = (1.02–1.9)] (3) and the quoted effect estimate in the meta-analysis is OR(C.I.) = 0.46(0.30–0.70). This significant negative association and the negative association reported by de Meer et al. (4) are the two estimates which influence the pooled effect leading to the conclusion that

exposure to cats exerts a preventive effect on asthma. Considering the cohort size, the pooled effect would have been less conclusive, if the effect estimate quoted as reported by Smedje et al. was left out. We have also noticed that, for example, Brussee et al. have reported the effect of exposure to cat allergen on the development of asthma using the Dutch PIAMA study. However, this study was not included in the meta-analysis, which may be an indication of flaw in the study selection procedure (7).

Finally, although the author mentions that only a few studies have adjusted for family inheritance, the possibility of reverse causation was not appropriately addressed in the article.

The article 'exposure to furry pets and the risk of asthma and allergic rhinitis: a meta-analysis' attempts to summarize the disputed results of recent studies on the effect of pet exposure on asthma. However, the diverse definition of the exposure and the health outcomes and the extracted effect estimates, which were not seen in the original article, mislead the readers to draw inadequate conclusions.

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References

1. Takkouche B, Gonzalez-Barcala FJ, Etminan M, Fitzgerald M. Exposure to furry pets and the risk of asthma and allergic rhinitis: a meta-analysis. *Allergy* 2008;**63**:857–864.
2. Lau S, Illi S, Sommerfeld C, Niggemann B, Bergmann R, von Mutius E et al. Early exposure to house-dust mite and cat allergens and development of childhood asthma: a cohort study. Multicentre Allergy Study Group. *Lancet* 2000;**356**:1392–1397.
3. Smedje G, Norback D. Incidence of asthma diagnosis and self-reported allergy in relation to the school environment – a four-year follow-up study in schoolchildren. *Int J Tuberc Lung Dis* 2001;**5**:1059–1066.

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4. de Meer G, Toelle BG, Ng K, Tovey E, Marks GB. Presence and timing of cat ownership by age 18 and the effect on atopy and asthma at age 28. *J Allergy Clin Immunol* 2004;**113**:433–438.
5. Nafstad P, Magnus P, Gaarder PI, Jaakkola JJ. Exposure to pets and atopy-related diseases in the first 4 years of life. *Allergy* 2001;**56**:307–312.
6. Chen CM, Rzehak P, Zutavern A, Fahlbusch B, Bischof W, Herbarth O et al. Longitudinal study on cat allergen exposure and the development of allergy in young children. *J Allergy Clin Immunol* 2007;**119**:1148–1155.
7. Brussee JE, Smit HA, Van Strien RT, Corver K, Kerkhof M, Wijga AH et al. Allergen exposure in infancy and the development of sensitization, wheeze, and asthma at 4 years. *J Allergy Clin Immunol* 2005;**115**:946–952.