Hen’s egg allergen in house and bed dust is significantly increased after hen’s egg consumption

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Aim: Cutaneous exposure to food allergens seems to be an important way of sensitization. It has been shown that household consumption of peanut is a risk factor for the development of peanut allergy. Furthermore, peanut protein was found in house dust. Yet there is only little data on other food allergens; therefore, we wanted to investigate whether hen’s egg (HE) protein could be found in domestic areas.

Methods: 8 households were included in the study. All households were asked to consume a meal of scrambled eggs in their habitual eating areas. Before and 48 hours after hen’s egg consumption dust samples were collected in the habitual eating areas and from bed sheets, using a special vacuum cleaner device. HE protein was extracted and HE allergen levels were measured with a commercially available ELISA (limit of detection: 0.05 µg/g). Wilcoxon rank test was used to compare HE levels before and after HE consumption.

Results: HE protein was detectable in all 8 households in the habitual eating areas as well as on bed sheets. At baseline, there was a median of 13.05 µg/g HE protein (range 6.5-13.4 µg/g) in the habitual eating area and a median of 12.9 µg/g HE protein (range 2.0-18.4 µg/g) on the bed sheets. 48 hours after consumption of scrambled egg significantly increased levels were measured with a median of 214.0 µg/g HE protein (range 17.0-2,409.4 µg/g; p<0.05) for the eating area and a median of 50.3 µg/g HE protein (range 5.9-247.0 µg/g; p<0.05) in bed sheets.

Discussion: HE allergens were detectable in the house dust of all households not only in dining areas but also in the bed where HE is usually not consumed, indicating a spreading of food allergens. Furthermore, an increase in protein levels measured after consumption of a HE meal was shown. For infants, who spent most time in bed, house dust containing food allergens could be an important risk factor for food sensitization.

Conclusion: HE allergen was found in house and bed dust with high levels following HE consumption, indicating a potential risk factor for the development of HE sensitization. Nevertheless, further research is necessary to proof whether HE allergens in house and bed dust can cause sensitization and whether there is a correlation between allergen levels and the level of sensitization.