

ORGANOPHOSPHATE TRIESTERS IN HOUSE DUST AND ITS RELATION TO ALLERGIC SYMPTOMS

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Background and Aims: Organophosphate triesters (OPE) are a range of compounds widely used as plasticizers and additive flame retarders. To date, only a limited number of studies have examined OPE levels in house dust and their relation to inhabitants' health. The aim of this study was to measure OPE levels in house dust and to evaluate the relationship between exposure to OPE and recent allergy medication in inhabitants.

Methods: Dust samples were collected from the living room of 182 single family dwellings in 6 cities in Japan. The "floor" samples were collected from floor and shelves lower than 35 cm from the floor, and "multi-surface" samples were collected from anything above 35 cm from the floor, such as shelves, furniture, walls, ceilings, etc. After being extracted by acetone, samples were analyzed by GC/FPD to determine the concentrations of 11 compounds. All inhabitants living in the target dwellings were given self-administered questionnaires to assess their allergic medication within the past 2 years.

Results: Collected dust weight that exceed 25 mg was included into the results. The prevalence of asthma, atopic dermatitis, and rhinitis was 4.8%, 9.9% and 18.2%, respectively. TBEP was detected from all samples; the median value was 580 µg/g in floor and 111 µg/g in multi surface dust, followed by TCiPP; 8.69 µg/g and 25.8µg/g, respectively. Significant associations between the prevalence of atopic dermatitis and TBP, TCiPP, TCEP, TEHP, and TDCPP in floor dust (per log₁₀-unit, odds ratio: 1.93-2.26) was obtained after adjustment, but not with multi-surface dust. The prevalence of asthma and allergic rhinitis was related to TBP.

Conclusions: The results suggested that exposure to OPE may cause dermatitis. The levels of OPE in this study were relatively higher compared to previous studies in Europe and the US, and thus further studies of OPE should be conducted.

References:

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