Indoor exposure of expecting mothers by VOC at home induce wheezing in young children

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Aims: To assess the effects of domestic exposure to volatile organic compounds during pregnancy and in the first year of life on respiratory diseases in young children.

Methods: A prospective cohort study was conducted in Leipzig, Germany, in expecting mothers and their children during the first year of life. Concentrations of volatile organic compounds were measured during these periods. Specific redecoration-associated VOCs have been identified. The health effects of these VOC were assessed for the exposure periods.

Results: We found VOC that were specifically associated to floor covering, floor covering with adhesives, and painting. Among respiratory health effects, wheezing that needed medical treatment was found to be most significantly associated to redecoration-related VOC exposures. Floor covering at home resulted in increased exposure levels of six specifically flooring-related VOC which induced significantly increased risks for treated wheezing. Among the specifically redecoration-associated VOCs, elevated styrene concentrations during pregnancy and during the first year of life, and methyl isobutyl ketone concentrations during the first year of life were identified to induce treated wheezing. For adhesive-related VOC we found significant adverse effects for ethylbenzene octane, 1-butanol, and o-xylene at elevated concentration levels during pregnancy. For painting-related VOC, we did not find significant risk increases.

Conclusions: VOC exposures during pregnancy have been identified to induce adverse effects of on children's respiratory health in the year after birth. We found these effects of exposure because of redecoration that recently mostly have been only accused to cause immediately respiratory effects in children.

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