

FREQUENT USE OF HOUSEHOLD CLEANING SPRAYS AND DECREASES IN HEART RATE VARIABILITY IN SAPALDIA

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Background and Aims: Household cleaning products are an indoor source of exposure to volatile organic compounds and toxic air contaminants. We investigated if non-professional use of household cleaning and air freshening sprays, and scented products was associated with reduced heart rate variability in the Swiss Cohort Study on Air Pollution and Lung and Heart Diseases in Adults (SAPALDIA).

Methods: In a cross-sectional survey, 24-hour electrocardiograms were recorded in 580 randomly selected SAPALDIA participants • 50 years of age, who also reported cleaning activities in their homes. Of the 580 participants, 515 reported use of any household spray or scented product, and 65 did not report use to any product and were considered unexposed. Adjusted average percent changes in standard deviation of all normal-to-normal intervals in 24-hours (24-hr SDNN), total power (TP), low frequency (LF), and high frequency (HF) were estimated in association with frequency (< 1, 1-3, and 4-7 days/week, unexposed as reference) of using cleaning sprays, air freshening sprays, and scented products in separate multiple linear regression models after adjustment for potential confounders. Smoking status, markers of systemic inflammation, and presence of chronic airways disease were evaluated for effect modification.

Results: Statistically significant ($p < 0.05$) decreases in 24-hr SDNN and TP were observed in association with frequent use of all products of interest. Relative to unexposed subjects, the strongest reductions in 24-hr SDNN (-12.2%, 95%CI: -20.6 – -2.0%) and TP (-28.8%, 95%CI: -45.7– -7.7%) were observed in subjects who used air freshening sprays 4-7 days/week. The inverse effects from using cleaning and air freshening sprays, and scented products on 24-SDNN, TP, LF, and HF were observed mainly in subjects present with chronic airways disease.

Conclusions: Chronic use of household cleaning spray products may affect autonomic dysfunction in older adults, and those with pre-existing pulmonary conditions may be more susceptible.