Cleaning products increase asthma during COVID

Cheryl le Roux | Educator

09/03/21

A recent study published in *The Journal of Allergy and Clinical Immunology: In Practice* has found significant associations between frequent disinfectant use since the COVID-19 pandemic and uncontrolled asthma ([1]).

Asthma is a complex, multifaceted respiratory disease that affects an estimated 2.7 million Australians (11% of the total population) ([2]).

Household disinfectants, particularly those with strong odours, are known asthma triggers. Cleaning products are considered respiratory irritants that cause inflammation and bronchial hyper-responsiveness. Research from occupational studies suggests that exposures to cleaning/disinfecting agents may be associated with an inflammatory response and airway remodelling and may lead to sensitizer-induced asthma through IgE and non-IgE pathways as well as irritant-induced asthma ([3],[4]). The use of household cleaning products and disinfectants, especially in spray form, has been associated with asthma ([5],[6],[7],[8],[9]) and decreased lung function in adults ([10],[11]).

Increased cleaning and disinfecting related to the COVID-19 pandemic, combined with people spending more time indoors may expose people with asthma to more environmental triggers for asthma symptoms. For women who reported using bleach 4-7 times per week, the odds of asthma increased compared with those who never used bleach ([12]). Household asthma triggers may also include air pollutants ([13]), such as air particulate matter from second-hand smoke and mould.

There is also an increased risk for childhood wheeze and asthma (but not atopy) at age 3 years for children from homes with high use of cleaning products ([14]). Scented cleaning products in particular had a strong association and might be important drivers of this risk.

In this latest study, an online survey of adults with asthma (n = 795) was conducted between May

and September 2020, collecting information relating to handwashing and hand sanitiser use, household disinfectant use and frequency. Participants were also asked questions about asthma symptoms, use of rescue medications, the effect of asthma on daily functioning, and personal control to determine an overall “asthma control score” ([1]).

More than 95% of participants reported increased handwashing practices, and 89% reported increased use of alcohol-based sanitiser since the COVID-19 pandemic. Participants who reported household disinfectant use five or more times per week increased 138% for disinfectant wipes, 121% for disinfectant sprays, 155% for bleach and water solution, and 89% for other liquids since the COVID-19 pandemic began. There was a significant association of frequent disinfectant use since the pandemic with uncontrolled asthma.

There are some limitations to this study. The cross-sectional study design does not allow for assessment of the causal relationship between the increased frequency of disinfecting and uncontrolled asthma. Also, participants were primarily female, white, and well educated, which limits generalizability, and the exposure and outcome measurements were self-reported with potential for information bias.

Nonetheless, the study indicates that people with asthma could be negatively affected by increases in disinfectant use and should discuss with their health care providers safer alternatives for cleaning, as well as managing symptoms. Cleaning product alternatives include vinegar, water and a drop of dish detergent, 70% alcohol, or hydrogen peroxide. Switching to cleaning products that are wiped, not sprayed, and low volatility and ‘environmentally friendly’ cleaning products is also preferable.

References

1 Eldeirawi K, Huntington-Moskos L, Nyenhuis SM, Polivka B. Increased disinfectant use among adults with asthma in the era of COVID-19. J Allergy Clin Immunol Pract. 2020 Dec 29.

2 Australian Institute of Health and Welfare. Asthma, associated comorbidities and risk factors [Internet]. Australian Institute of Health and Welfare. 2020 [cited 2021 Mar 8]. Available from: https://www.aihw.gov.au/reports/chronic-respiratory-conditions/asthma-associated-comorbidities-risk-factors/contents/asthma-and-associated-comorbidities

3 Clausen PA, Frederiksen M, Sejbæk CS, Sørli JB, Hougaard KS, Frydendall KB, et al. Chemicals inhaled from spray cleaning and disinfection products and their respiratory effects. A comprehensive review. International Journal of Hygiene and Environmental Health. 2020 Aug 1;229:113592.

4 Folletti I, Siracusa A, Paolocci G. Update on asthma and cleaning agents. Curr Opin Allergy Clin Immunol. 2017 Apr;17(2):90–5.

5 Le Moual N, Varraso R, Siroux V, Dumas O, Nadif R, Pin I, et al. Domestic use of cleaning sprays and asthma activity in females. Eur Respir J. 2012 Dec;40(6):1381–9.

6 Zock J-P, Plana E, Jarvis D, Antó JM, Kromhout H, Kennedy SM, et al. The Use of Household Cleaning Sprays and Adult Asthma. Am J Respir Crit Care Med. 2007 Oct 15;176(8):735–41.

7 Weinmann T, Gerlich J, Heinrich S, Nowak D, Mutius E von, Vogelberg C, et al. Association of household cleaning agents and disinfectants with asthma in young German adults. Occup Environ Med. 2017 Sep;74(9):684–90.

8 Weinmann T, Forster F, von Mutius E, Vogelberg C, Genuneit J, Windstetter D, et al. Association Between Occupational Exposure to Disinfectants and Asthma in Young Adults Working in Cleaning or Health Services: Results From a Cross-Sectional Analysis in Germany. J Occup Environ Med. 2019 Sep;61(9):754–9.

9 Lemire P, Dumas O, Chanoine S, Temam S, Severi G, Boutron-Ruault M-C, et al. Domestic exposure to irritant cleaning agents and asthma in women. Environ Int. 2020 Nov;144:106017.

10 Svanes Ø, Bertelsen RJ, Lygre SHL, Carsin AE, Antó JM, Forsberg B, et al. Cleaning at Home and at Work in Relation to Lung Function Decline and Airway Obstruction. Am J Respir Crit Care Med. 2018 May 1;197(9):1157–63.

11 Archangelidi O, Sathiyajit S, Consonni D, Jarvis D, De Matteis S. Cleaning products and respiratory health outcomes in occupational cleaners: a systematic review and meta-analysis. Occup Environ Med. 2020 Nov 24.

12 Matulonga B, Rava M, Siroux V, Bernard A, Dumas O, Pin I, et al. Women using bleach for home cleaning are at increased risk of non-allergic asthma. Respir Med. 2016 Aug;117:264–71.

13 Gold DR, Adamkiewicz G, Arshad SH, Celedón JC, Chapman MD, Chew GL, et al. NIAID, NIEHS, NHLBI, MCAN Workshop Report: The Indoor Environment and Childhood Asthma: Implications for Home Environmental Intervention in Asthma Prevention and Management. J Allergy Clin Immunol. 2017 Oct;140(4):933–49.

14 Parks J, McCandless L, Dharma C, Brook J, Turvey SE, Mandhane P, et al. Association of use of cleaning products with respiratory health in a Canadian birth cohort. CMAJ. 2020 Feb 18;192(7):E154–61.