The Journal of Immunology

Dermal exposure to the commonly used antimicrobial chemical triclosan promotes allergic responses in skin and lung (HYP7P.317)

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Abstract

There has been a dramatic increase in the incidence of allergies and asthma in the U.S. thought to be influenced by environmental exposures. The antimicrobial chemical triclosan is found in countless products such as soap, lotion, toothpaste and kitchen utensils (0.1-1%). Triclosan is detected in the urine of the majority of Americans and recent epidemiological studies have found a positive association between urinary triclosan levels and allergic disease. Interestingly, exposure to triclosan, a non-sensitizer, enhanced allergic responses in a mouse ovalbumin (OVA) asthma model. To help elucidate the mechanisms behind the augmented allergic responses, triclosan (0-3%) was applied to the dorsal surface of the ears of BALB/c mice sensitized to OVA. Analysis of skin revealed infiltration of leukocytes and a dramatic increase in thymic stromal lymphopoietin (TSLP) expression even after a single dose. Analysis of cells in the draining LN of triclosan-exposed mice revealed a peak cell response at 7 days, including increased numbers and frequencies of GATA-3+ IL-4+ CD4 T cells, and CD11b+ CD80+ CD86+ MHC class II+ dendritic cells. Mice exposed to triclosan and challenged with OVA via airway aspiration also showed increased Th2 responses and OVA+ APC in their BAL fluid. These results suggest that triclosan augments allergic responses in skin and lung in part through mechanisms that involve TSLP and enhanced Th2 responses.

« Previous | Next Article »
Table of Contents

This Article

The Journal of Immunology
May 1, 2014
vol. 192 (1 Supplement)
119.32

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