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Title: IgE sensitisation to food allergens relates to increased airway and systemic inflammation in asthmatic children – Results from the MIDAS study

Dr. Andrei 8695 Malinovschi Andrei.Malinovschi@medsci.uu.se MD [1], Prof. Christer 8701 Janson Christer.Janson@medsci.uu.se MD [1], Dr. Malin 8702 Berthold malin.berthold@thermofisher.com [2], Dr. Magnus 8703 Borres magnus.borres@thermofisher.com MD [2], Prof. Kjell 8704 Alving kjell.alving@kbh.uu.se [3] and Prof. Lennart 8863 Nordvall lennart.nordvall@kbh.uu.se MD [3]. [1] Department of Medical Sciences, Uppsala University, Uppsala, Sweden ; [2] Thermo Fisher Scientific, Immunodiagnostics, Uppsala, Sweden and [3] Department of Women's and Children's Health, Uppsala University, Uppsala, Sweden .

Body: Food allergy is common among children with allergic asthma and has been linked to asthma severity. However, the relation between IgE sensitisation to food allergens and local airways inflammation or systemic inflammation in subjects with allergic asthma has been little studied. Within the frame of an industry-academy collaboration on minimally-invasive diagnostics (MIDAS), fraction of NO in exhaled air (FeNO), serum eosinophil cationic protein (sECP) and IgE against aero- or food allergen mix was measured in 151 asthmatic children aged 10-18 years. Three asthma groups were defined: non-atopic (n=31, median age 15 yrs), IgE-sensitised to only aeroallergens (n=59, median age 15 yrs) and IgE-sensitised to both aero- and food allergens (n=61, median age 14 yrs). FeNO levels were 8.9 ppb (7.1, 11.1) in non-atopic asthmatics, 14.2 ppb (11.7, 17.2) in aeroallergen-sensitised asthmatics and 23.4 ppb (19.4, 28.3) in asthmatics sensitised to both aero- and food allergens ($p<0.01$ for all comparisons). Corresponding sECP levels for the three groups were: 9.6 ng/mL (7.9, 11.8), 11.9 ng/mL (9.7, 14.5) ($p=0.55$ vs. non-atopic asthma), 21.9 ng/mL (18.6, 25.7) ($p<0.001$ vs. each of the other two groups). Asthmatic subjects sensitized to both aero- and food allergens had higher levels of FeNO and sECP than non-sensitised or aeroallergens-sensitised subjects, after adjustments for gender, age, height, lung function, total IgE. In conclusion, sensitisation to food allergens is common among children with allergic asthma and is related to increased local as well as systemic inflammation. The clinical implications of these findings warrant further studies.