The association between nasal eosinophil and aeroallergen sensitization in children and adolescents in Seoul, Korea

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Introduction
Local infiltration of eosinophils is the hallmark of allergic inflammation in the nasal tissues. Nasal eosinophil examination is useful in the diagnosis of nasal allergic inflammation and allergic rhinitis. Nasal exposure to sensitized aeroallergens increases nasal eosinophil and nasal allergic symptoms.

Methods
To identify the correlation between nasal eosinophil and aeroallergen sensitization in children and adolescents. We recruited patients less than 18 years of age, with a history of chronic and acute rhinitis, and those who had nasal eosinophil examinations and MAST to aeroallergens between March 2013 and February 2016 at the Allergy Clinic in Seoul St. Mary’s Hospital in Seoul, Korea. Patients’ medical records were reviewed retrospectively. We analyzed data using T-test, Mann-Whitney test and ANOVA to determine the association between nasal eosinophil and 18 aeroallergens (i.e. Birch-Alder Mix, oak white, Bermuda grass, orchard grass, timothy grass, sweet vernal grass, rye, mugwort, short ragweed, Japanese hop, Alternaria alternata, Aspergillus, Cladosporium, cats, dogs, cockroaches, Dermatophagoides farinae, and Dermatophagoides pteronyssinus).

Results
Of the 245 patients enrolled, 156 (63.7%) were males and mean age (± standard deviation [SD]) was 7.9 years (±3.8). In total, 175 (71.4%) patients were sensitized to at least one of the 18 aeroallergens tested. Additionally, 118 (48.2%) and 69 (28.2%) patients had at least 1% and 5% prevalence rates of nasal eosinophils, respectively. None of the patients had severe lower respiratory infection (e.g. pneumonia) or were immunocompromised. There were significant differences in the percentage of nasal eosinophils between the groups sensitized and non-sensitized to aeroallergens ($P<.001$). Among the 18 aeroallergens, 18 (8.3%) patients who were sensitized to Alternaria alternata showed the greatest mean percentage (± SD) of nasal eosinophil (27.9% [±32.4]) and the greatest significant difference in the proportion of nasal eosinophil when compared to the non-sensitized group (7.8% [±17.1]) ($P=.001$).

Conclusion
Nasal eosinophil was significantly associated with sensitization to aeroallergens. Data suggest that nasal eosinophil is the most common among patients sensitized to Alternaria alternata.