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Increasing Prevalence of Multi-Allergen Sensitivities in Patients with Allergic Rhinitis and Asthma in Eastern India

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Abstract : There is a rising concern with increasing allergies affecting both adults and children in rural and urban India. Recent report on adults in a densely populated North Indian city showed sensitization rates for house dust mite, parthenium, and cockroach at 60%, 40% and 18.75% that is now comparable to allergy prevalence in cities in the United States. Data from patients residing in the eastern part of India is scarce. A retrospective study (over 2 years) was done on patients with allergic rhinitis and asthma where allergen-specific IgE levels were measured to see the aero-allergen sensitization pattern in a large metropolitan city of East India. Total IgE and allergen-specific IgE levels were measured using ImmunoCAP (Phadia 100, Thermo Fisher Scientific, Sweden) using region-specific aeroallergens: Dermatophagoides pteronyssinus (d1); Dermatophagoides farinae (d2); cockroach (i206); grass pollen mix (gx2) consisted of Cynodon dactylon, Lolium perenne, Phleum pratense, Poa pratensis, Sorghum halepense, Paspalum notatum; tree pollen mix (tx3) consisted of Juniperus sabinoides, Quercus alba, Ulmus americana, Populus deltoides, Prosopis juliflora; food mix 1 (fx1) consisted of Peanut, Hazel nut, Brazil nut, Almond, Coconut; mould mix (mx1) consisted of Penicillium chrysogenum, Cladosporium herbarum, Aspergillus fumigatus, Alternaria alternate; animal dander mix (ex1) consisted of cat, dog, cow and horse dander; and weed mix (wx1) consists of Ambrosia elatior, Artemisia vulgaris, Plantago lanceolata, Chenopodium album, Salsola kali, following manufacturer's instructions. As the IgE levels were not uniformly distributed, median values were used to represent the data. 92 patients with allergic rhinitis and asthma (united airways disease) were studied over 2 years including 21 children (age < 12 years) who had total IgE and allergen-specific IgE levels measured. The median IgE level was higher in 2016 than in 2015 with 60% of patients (adults and children) being sensitized to house dust mite (dual positivity for Dermatophagoides pteronyssinus and farinae). Of 11 children in 2015, whose total IgE ranged from 16.5 to >5000 kU/L, 36% of children were polysensitized (≥4 allergens), and 55% were sensitized to dust mites. Of 10 children in 2016, total IgE levels ranged from 37.5 to 2628 kU/L, and 20% were polysensitized with 60% sensitized to dust mites. Mould sensitivity was 10% in both of the years in the children studied. A consistent finding was that ragweed sensitization (molecular homology to Parthenium hysterophorus) appeared to be increasing across all age groups, and throughout the year, as reported previously by us where 25% of patients were sensitized. In the study sample overall, sensitizations to dust mite, cockroach, and parthenium were important risks in our patients with moderate to severe asthma that reinforces the importance of controlling indoor exposure to these allergens. Sensitizations to dust mite, cockroach and parthenium allergens are important predictors of asthma morbidity not only among children but also among adults in Eastern India.

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