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BACKGROUND

- Prior studies in patients with IgE deficiency (IgE<2.5 kU/L) have demonstrated a high prevalence of allergic-type respiratory diseases.
- Evaluation of environmental allergies relies on skin prick testing (SPT) and/or intradermal skin testing (IDST) and/or measuring serum specific IgE (ssIgE) to different environmental allergens.
- The utility of allergen-specific testing in IgE-deficient patients is unknown.
- We investigated the role of performing skin testing and measuring ssIgE to identify environmental sensitizations in IgE-deficient patients.

METHODS

- 71 IgE-deficient patients with diagnosis of rhinitis and/or asthma who had SPT performed as evaluation for their chronic respiratory symptoms were identified between 2014-2018.
- Patients were matched by age and gender with patients with different IgE cutoff levels who had SPT done for evaluation of environmental allergies: normal IgE (2.5≤IgE<100), high IgE (100≤IgE<1000), very high IgE levels (≥1000 kU/L).
- Information about the results of the SPT, IDST and ssIgE (if performed), were collected, along with demographic information.

Table 1. The sensitization rate in IgE deficient patients compared with those with normal, high and very high IgE levels

	IgE deficiency (IgE<2.5) N=71	Normal IgE (2.5≤IgE<100) N=71	High IgE (100≤IgE<1000) N=70	Very High IgE (IgE≥1000) N=70
Age (years) (median, range)	52 (48-60)	53 (45-60)	53 (47-58)	53 (46-59)
Female (N, %)	57 (80.3)	56 (78.9)	56 (78.9)	56 (80)
Race (N, %)				
White	7 (9.9)	12 (16.9)	4 (5.6)	0 (0)
African-American	18 (25.4)	17 (23.9)	29 (40.8) [#]	30 (42.9) [#]
Hispanic	33 (46.5)	28 (39.4)	3 (4.2) [#]	5 (7.1) [#]
Other/ Unknown	13 (18.3)	14 (19.7)	35 (49.3)	35 (50)
Rate of sensitization on SPT* (Patients with at least one positive SPT /total patients in whom SPT were done , %)	14/71 (19.7)	35/71 (49.2)	64/70 (91.4)	58/70 (82.9)
Rate of sensitization on IDST 1st strength** (Patients with at least one positive IDST 1 st strength / total patients in whom IDST 1 st strength were done , %)	5/37 (13.5)	23/45 (51.1) [#]	45/53 (84.9) [#]	42/50 (84) [#]
Rate of sensitization on IDST 2nd strength** (Patients with at least one positive IDST 2 nd strength / total patients in whom IDST 2 nd strength were done , %)	9/20 (45)	15/28 (53.6)	20/26 (76.9) [#]	21/26 (80.8) [#]
Overall rate of sensitization on skin tests (Patients with at least one positive test on SPT or IDST/ total patients tested)	21/71 (30)	49/71 (69) [#]	67/70 (95.7) [#]	65/70 (92.9) [#]
Rate of sensitization based on ssIgE (Patients with at least one positive ssIgE / total patients in whom ssIgE were done , %)	2/52 (3.85)	19/38 (50) [#]	25/26 (96.2) [#]	34/35 (97.1) [#]
Prevalence of allergy immunotherapy prescription (Number of patients on allergy shots/ total patients tested)	4.2%	5.6%	19.7% [#]	22.9% [#]

*grass, trees, ragweed, mugwort, English plantain, birch, weeds, dog, cat, mouse, rat, cockroach, dust mites, feathers, molds (Greer Laboratories Inc)

**IDST at 1st strength: 1/100 w/v dilution of the stock solution; IDST at 2nd strength (performed if IDST 1st strength was negative but the physician determined that additional testing is needed: 1/10 w/v dilution of the stock solution)

[#] p<0.05- comparisons made between IgE deficiency group and each of the other IgE cutoff levels groups

RESULTS

- 30% of IgE-deficient patients had at least one positive skin test (SPT and/or IDST), compared with 69% of patients with normal IgE levels, 94% with high and 93% with very high IgE levels (p<0.05).
- SPT identified at least one sensitization in 20% of IgE-deficient patients. IDST detected at least one positive skin test in 15.5% of patients.
- IgE-deficient patients had significantly more ssIgE tests performed than patients with high and very high IgE levels. The rate of positive ssIgE was significantly lower in IgE deficiency (3.8% vs. 50%, 96.2% and 97.1%, p<0.05).
- Overall, 4.2% of IgE-deficient patients were on immunotherapy, similar to the rate in patients with normal IgE levels (5.6%). Significantly higher rates of IT were found in patients with high (19.7%) and very high IgE levels (22.9%) (p<0.05).

CONCLUSION

- Although IgE-deficient patients lack serum IgE, 30% of those with respiratory symptoms had positive skin testing. Allergen-specific tests are useful to diagnose environmental sensitizations and to prescribe immunotherapy in IgE-deficient individuals.