Association Between Skin Test Positivity and Malignancy in IgE-Deficient Patients

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INTRODUCTION

- Recent findings have shown that IgE plays a role in tumor immunity and that IgE-deficient (IgE<2.5 kU/L) patients have higher rates of malignancy.
- Despite undetectable serum IgE, some IgE-deficient patients exhibit positive skin testing with standard aeroallergens.
- We investigated whether the presence of skin test reactivity influenced the susceptibility of IgE-deficient patients to develop malignancy
- Our hypothesis was that IgE-deficient patients with negative skin tests would have higher rates of malignancy than those with positive skin tests, possibly because of lack of tissue protective-IgE.

METHODS

- We identified 69 patients with selective IgE-deficiency but with normal levels of other immunoglobulin isotypes who had been evaluated between 2014-2018 for chronic respiratory symptoms and had environmental skin tests (skin prick (SPT) and/or intradermal skin testing (IDST)) performed.
- Malignancy status and skin tests results were determined by chart review.

RESULTS

- Most of the IgE deficient patients were women (80%), with a mean age of 50 (±15.05) and of Hispanic origin (46%). Overall, 12/69 (17.4%) IgE deficient patients presenting with environmental allergy-like symptoms had cancer diagnosis (**Table 1**)
- Overall, at least one positive skin test (SPT or IDST) was depicted in 21/69 (30.4%) patients. 48 patients were non-atopic **(Figure 1)**
- The rate of malignancy diagnosis was significantly higher in non-atopic IgE deficient patients (11/48, 22.9%), compared with those with at least one positive skin test (1/21, 4.8%, OR=12.76, 95% CI: 1.12-144.2, p=0.04) **(Figure 2)**
- Both solid and hematologic malignancies were present in this cohort of patients with IgE deficiency. **(Figure 2)**

Table 1. Characteristics of IgE deficient patients

	Entire cohort of IgE deficient patients (N=69)	Status of malignancy diagnosis	
		Malignancy (N=12)	No malignancy (N=57)
Age, years (mean, ±SD)	50.4 (15.05)	60 (7)	49 (16)
Gender, female (n, %)	55 (79.7%)	47 (82.5%)	38 (66.7%)
Race (n, %)			
White	8 (11.6)	2 (16.7%)	6 (10.5%)
African-American	17 (24.6)	3 (25%)	14 (24.6%)
Hispanic	32 (46.4)	7 (58.3%)	25 (43.9%)
Other/ Unknown	12 (17.4)	0%	12 (21.1%)
Diagnosis of rhinitis (n, %)	65 (94%)	11 (91.7%)	54 (94.7%)
Diagnosis of asthma (n, %)	26 (37.6)	5 (41.7%)	21 (36.8%)
Absolute eosinophil count (cells/ul) (mean, ±SD)*	0.2 (0.3)	0.2 (0.1)	0.2 (0.4)
Quantitative immunoglobulins (mg/dl) (mean, ±SD)**			
Immunoglobulin G	1180.76 (361.3)	1114.16 (241.4)	1192.87 (380.7)
Immunoglobulin A	204.89 (105.6)	219.16 (75.6)	202.37 (110.7)
Immunoglobulin M	140.73 (164.14)	109.86 (35.6)	146.34 (177.7)
Diagnosis of any type of malignancy (n, %)	12 (17.4)		

Figure 1. Flowchart of various skin testing performed and its positivity

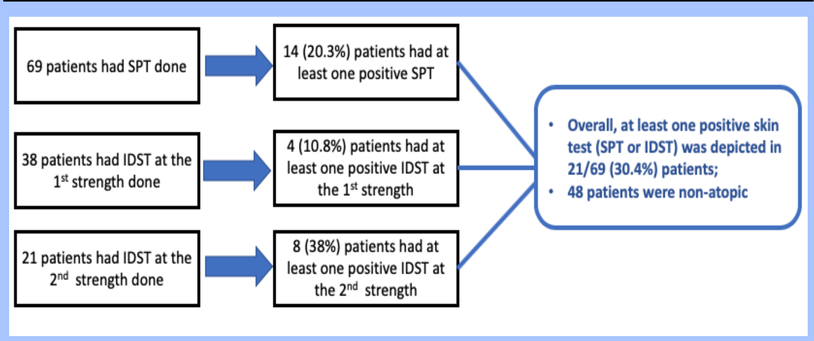
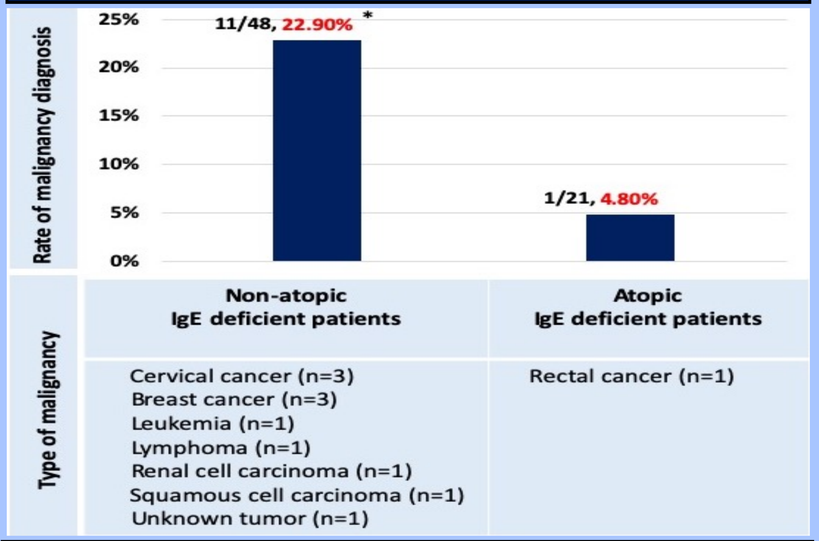


Figure 2. The rate and type of malignancy in atopic vs non-atopic IgE deficient patients



CONCLUSIONS

- The lower rate of a malignancy diagnosis in IgE-deficient patients with at least one positive skin test suggests a malignancy-protective role of bound/tissue IgE in this subgroup.
- Our results have important clinical relevance, since this is the first attempt to investigate potential factors that could predict which IgE deficient patients have the highest risk to develop malignancy. These intriguing findings indicate the need for further research in this new area.

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