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Selective IgA deficiency and allergic diseases: Clinical and immunological evaluation

Selami Ulaş[a*], Serdar Al[b*], Sezin Naiboğlu[c], Işılay Turan[c], Gülşah Kalay[c], Nermin Kapçı[c], Özge Türkyılmaz Uçar[c], Sibel Kaplan[c], Erkan Çakmak[c], Kübra Yırgın[c], Ahmet Sert[c], Meryem Özçelik[c], Burcu Çil[c], Şeyda Köse[c], Ilke Yıldırım[c], Simge Kılıçoğlu[c], Pınar Gökmirza Özdemir[c], Mehmet Halil Çeliksoy[c], Çiğdem Aydoğmuş[c]

[a]*Department of Pediatric Allergy and Clinical Immunology, Tekirdağ Dr. I. Fehmi Cumalioğlu City Hospital, Tekirdağ, Türkiye*
[b]*Department of Pediatric Allergy and Clinical Immunology, Medipol University, Istanbul, Türkiye*
[c]*Department of Pediatric Allergy and Clinical Immunology, Başakşehir Çam and Sakura City Hospital, Istanbul, Türkiye*

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Abstract
Purpose: We aimed to investigate allergic sensitization and associated factors in pediatric patients with selective immunoglobulin A deficiency (SIgAD) and to evaluate differences between allergic and nonallergic groups.
Methods: We analyzed 110 patients (aged 4–18 years) diagnosed with SIgAD at Çam and Sakura City Hospitals, Istanbul, between 2021 and 2024. Their demographic, clinical, and laboratory data were assessed.
Results: Allergic sensitization was detected in 62.7% of patients. Patients with allergic sensitization, family history of allergic diseases, eosinophilia, and elevated total immunoglobulin E (IgE) levels were significantly higher ($P < 0.05$). Immunglobulin M (IgM) levels were higher in the allergic group ($P = 0.01$), and they had lower neutrophil counts ($P = 0.03$). Allergic sensitization was lower in patients with autoimmune diseases ($P = 0.03$). In 60% of the patients, the main reason for presentation was recurrent infection.
Conclusion: Allergic sensitization with SIgAD is associated with genetic and immunological factors. A family history of allergic disease, eosinophilia, and elevated total IgE levels are important markers for the development of allergy. These findings highlight the need to closely monitor allergies in people with SIgAD.

***Corresponding authors**: Selami Ulaş, Department of Pediatric Allergy and Clinical Immunology, Tekirdağ Dr. İ. Fehmi Cumalioğlu City Hospital, Tekirdağ, Türkiye. *Email address*: selamiulas_23@hotmail.com; Serdar Al, Department of Pediatric Allergy and Clinical Immunology, Medipol University, İstanbul, Türkiye. *Email address*: drserdaral@gmail.com

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Introduction

Selective IgA deficiency (SIgAD) is the most common primary immunodeficiency, affecting 1 in 150–3000 people. SIgAD is typically diagnosed in individuals over the age of four with serum immunoglobulin A(IgA) levels below 7 mg/dL, while IgG and IgM remain within normal limits. Alternative reasons for hypogammaglobulinemia and T cell abnormalities are excluded, and a normal IgG response to vaccines is observed. SIgAD is thought to be caused by defects in B cells and T helper (Th) cells, and impairments in cytokine signalling. The genetic cause of SIgAD is not yet known.[1-4] The condition can cause frequent allergies, autoimmune diseases, infections, and a higher risk of cancer, but can also present asymptomatically.[4,5] Patients with SIgAD also have decreased secretory IgA levels. The reduced secretory IgA levels thus promote the penetration of food antigens and aeroallergens through the mucosal barrier, promoting the development of allergies.[6] In addition, a lack of secretory IgA can compromise the integrity of the mucosal barrier, leading to the onset of infection. It may play a role in the development of allergies to infections.[7-9] Although the diagnosis is often made during the investigation of complaints of frequent upper respiratory tract infections, some patients are also diagnosed during evaluations for allergies and autoimmunity. In 40.5% of cases, allergic symptoms manifest as the initial presentation.[10]

This study evaluated the prevalence and features of allergic disease in pediatric SIgAD patients. It also investigated the relationship between allergic disease and other comorbidities. The clinical, laboratory, and immunological features of allergic and nonallergic patients were compared. Finally, the potential factors contributing to allergy development were identified.

Methods

In this study, a retrospective analysis of the electronic health records of children diagnosed with SIgAD at the Pediatric Immunology and Allergy Clinic, Istanbul Başakşehir Çam and Sakura City Hospital, was conducted between January 2021 and January 2024. The study included patients aged 4–18 years. A standardized questionnaire was administered to collect data on various factors, including age, gender, birth type, and environmental exposures (such as pet ownership, smoking, mold, and wool exposure). In addition, a comprehensive medical history was obtained for each subject, encompassing information on antibiotic usage, the frequency of yearly infections, and the presence of recurrent infections (including otitis, pneumonia, sinusitis, tonsillopharyngitis, and bronchitis). The following parameters were also recorded: household population size, family history of atopy, initial symptoms leading to diagnosis, nursery attendance, and the presence of comorbid conditions such as food allergy, atopic dermatitis, asthma, allergic rhinitis, drug allergy, bronchiectasis, autoimmune diseases, autoinflammatory diseases, and malignancy. Based on the criteria outlined by the European Society for Immunodeficiencies (ESID), SIgAD was diagnosed.[11] Allergic rhinitis, allergic asthma, and food allergies were diagnosed using GINA, ARIA, and EAACI guidelines. Atopic dermatitis was diagnosed using the Hanifin and Rajka criteria.[12-15] Skin prick tests (SPTs) were performed using extracts from grass and tree pollen, *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*, Alternaria, and dog and cat epithelium, as well as food extracts, including egg white, egg yolk, cow's milk, casein, fish, wheat, and soy. The respiratory and food allergen panels were selected based on the most commonly encountered inhalant and food allergies in the region. The panels were then adjusted according to each patient's reported clinical symptoms following allergen exposure. The tests were performed according to the EAACI guidelines. The positive control comprised histamine hydrochloride (10 mg/mL), while the negative control consisted of saline. The evaluation of the wheal response occurred 15 min following the application of the test substance. A wheal size ≥3 mm was considered positive.[16] Laboratory data, including SPT results, eosinophil, lymphocyte, and neutrophil counts, serum levels of total serum IgE, IgG, IgA, and IgM, IgG subclass levels (IgG1, IgG2, IgG3, IgG4), anti-HBs levels, lymphocyte subgroups, serum-specific IgE for suspected allergens, and results of the respiratory function tests, were extracted from the electronic medical records.

Ethical approval for the study was granted by the Ethics Committee of Başakşehir Çam and Sakura City Hospital (File number: KAEK 2023-671).

Statistics

The data used in this study were analyzed using SPSS 22 software. The presentation of categorical variables was in the form of frequencies and percentages, while numerical variables were displayed as the mean ± standard deviation or the median (minimum–maximum). The normality of the data distribution was assessed via the Kolmogorov–Smirnov and Shapiro–Wilk tests. To analyze the data, the statistical analysis of categorical variables was conducted via the utilization of the Chi-square test, while numerical variables were analyzed using either the independent t-test or the Mann–Whitney U test, per the distribution characteristics. A P-value less than 0.05 was considered to be statistically significant.

Results

The study comprised 110 patients diagnosed with SIgAD, exhibiting a male-to-female ratio of 1.55. The sample population comprised 67 males (60.9%) and 43 females (39.1%). The median age of the patients was 104 months (range: 49–256 months). In the intrauterine period, 69% (76/110) of the patients were exposed to smoking, while 37% (41/110) were exposed to antibiotics. A family history of allergic diseases was reported in 50% (55/110) of the patients, whereas 6.3% (7/110) had a family history of immunodeficiency.

The most frequently reported initial symptom was recurrent infections, observed in 60% of patients (66/110). Antibiotic administration during the first year of life was reported in 77% (85/110) of the cases. Notably, 91% (100/110) of the patients experienced three or more

infections per year, while 33% (36/110) reported eight or more annual infections. The most prevalent infections were upper respiratory tract infections, affecting 70.1% of the patients, followed by bronchitis, which was observed in 47.7% of the cases.

Atopic conditions were found to be highly prevalent within the study population, with 86.4% (95/110) of patients diagnosed with at least one atopic disease and 62.7% (69/110) exhibiting allergic sensitization. The most prevalent atopic condition was allergic rhinitis, affecting 69.7% (76/110) of the patients, followed by asthma (55%, 60/110) and atopic dermatitis (32.4%, 35/110). The prevalence of food and drug allergies was documented in 12.7 (14/110) and 6.9% (7/110), respectively, of the patient population. Additionally, elevated total IgE levels (>100 IU/mL) were detected in 33% (36/110) of the patients, while eosinophilia was observed in 10.7% (11/110).

Autoimmune diseases were identified in 23.2% (25/110) of the patients, with Hashimoto's thyroiditis being the most prevalent. Allergen sensitization was found to be significantly more prevalent among patients with a family history of allergic diseases (P = 0.04). Similarly, elevated eosinophil counts (P = 0.001) and increased total IgE levels (P = 0.001) were observed to be associated with a higher risk of allergen sensitization. Conversely, sensitization rates were found to be lower in individuals diagnosed with autoimmune diseases (P = 0.03) or elevated neutrophil counts (P = 0.03). Among inhalant allergens, house dust mites were the most commonly identified, with *D. pteronyssinus* and *D. farinae*, affecting 41.8 and 38% of the patients, respectively, followed by grass pollen (24%). Egg white sensitization was the most prevalent (5.4%) among food allergens. Tables 1 to 3 present a comprehensive overview of the characteristics of the study population.

Table 1 General characteristics of patients with selective IgA deficiency.

Category	Characteristic	n (%)
Demographics	Age (months) (Median, Min-Max)	103.81 (49-256)
	Gender (male to female)	67 (60.9) to 43 (39.1)
	Type of birth (Vaginal-CS)	60 (54.2) to 50 (45.8)
Environmental exposures	Pet exposure during pregnancy	8 (7)
	History of antibiotic use during pregnancy	41 (37)
	Smoking exposure during pregnancy	76 (69)
	Pet exposure	21 (18.9)
	Smoking exposure	64 (58.2)
	Mold exposure	21 (19.1)
	Wool exposure	56 (51.1)
Health history	Antibiotic use in the first year	85 (77.5)
	Family history of atopy	55 (50)
	Family history of immunodeficiency	7 (6.3)
	History of going to nursery	55 (50)
	Household of 4 or more	100 (91)
Infection history	3 or more infections per year	100 (91)
	8 or more infections per year	37 (33.3)
Clinical findings	First finding (Frequent infections, allergy, autoimmunity, other)	66 (60) - 25 (23) - 8 (7) - 11 (10)
Allergies	History of food allergy	14 (12.7)
	History of atopic dermatitis	35 (32.4)
	Allergic rhinitis	76 (69.7)
	Asthma	60 (55)
Respiratory function	Respiratory function test (Normal to mild obstruction, moderate/severe obstruction)	98 (89.7) to 5 (5.1) to 6 (5.1)
Other health conditions	Drug allergy	7 (6.9)
	Bronchiectasis	1 (1)
	Autoimmune disease	25 (23.2)
	Autoinflammatory disease	4 (4.3)
Recurrent infections	Recurrent otitis	29 (27.1)
	Recurring pneumonia	15 (14.2)
	Recurring sinusitis	12 (11.2)
	Recurrent tonsillopharyngitis	77 (70.1)
	Recurring bronchitis	52 (47.7)
Miscellaneous	Malignancy	1 (1.1)
	Eosinophilia	11 (10.7)
	High total IgE	36 (33)
	Atopic disease	95 (86.4)
	Allergic sensitization	69 (62.7)

Table 2 Allergen sensitivity distribution.

Allergen	n (%)
Inhalant allergens	
Dermatophagoides pteronyssinus	46 (41.8)
Dermatophagoides farinae	41 (38)
Grass pollen	26 (24)
Alternaria	14 (13)
Tree pollen	8 (7.6)
Weed pollen	7 (6.7)
Cockroach	8 (7.6)
Cat	12 (11)
Dog	11 (10)
Food allergens	
Egg white	6 (5.4)
Egg yolk	4 (3.6)
Cow's milk	4 (3.6)
Peanuts	2 (2)
Wheat	1 (1)
Soybean	1 (1)
Fish	1 (1)

The total number of patients in each age group was as follows: 4–5 years (n = 24), 6–11 years (n = 57), and ≥12 years (n = 25), providing sufficient distribution for age-based comparisons.

When patients with SIgAD were categorized by age, asthma was the most common allergic disease in the 4–5 age group (64.3%), whereas allergic rhinitis was most prevalent in the 6–11 (80.7%) and ≥12 age groups (56%). No cases of drug allergy were identified in the 4–5 age group, but its prevalence increased with age, with 5.3% in the 6–11 group and 12% in those aged 12 and above (P = 0.04). The age-related distribution of allergic diseases is detailed in Table 4. Additionally, the prevalence of sinusitis also showed a significant increase with age (P < 0.001).

Regarding allergen sensitization, *D. pteronyssinus* was the most common respiratory allergen across all age groups (4–5: 35.7%; 6–11: 47.4%; ≥12: 40%). Among food allergens, egg allergy was the most frequently observed in both the 4–5 and 6–11 age groups (14.3 and 1.8%, respectively). Allergen sensitization by age is summarized in Table 5.

Discussion

This study investigates the presence of allergic sensitization and the associated factors in patients diagnosed with SIgAD. The primary objective of this study was to determine whether significant differences exist between SIgAD patients with and without allergic sensitization. Patients with allergic sensitization exhibited a significantly higher prevalence of a family history of allergic diseases and elevated total IgE levels, increased eosinophil counts, and higher serum IgM levels. Conversely, these patients had significantly lower neutrophil counts. These findings underscore the importance of closely monitoring individuals with SIgAD for potential allergic comorbidities.

The findings of this study indicate that the most prevalent clinical manifestation that results in a diagnosis of SIgAD is recurrent infections. It is hypothesized that SIgAD plays a role in the increased susceptibility to infections by promoting the colonization of pathogenic bacteria and increasing mucosal permeability.[17] However, the findings of this study revealed no significant difference in terms of infection type or frequency between allergic and non-allergic patients. Despite the documented prevalence of the association between SIgAD and allergic diseases in the extant literature, the causal nature of this relationship remains uncertain.[18,19]

In the presence of SIgAD, an elevated permeability of mucosal surfaces has been demonstrated to facilitate the process of allergen sensitization by increasing circulating antigen levels. Additionally, reduced serum monomeric IgA levels may contribute to immune system hyperactivation.[9,20–27] In our study, a family history of atopy, elevated eosinophil counts, and increased total IgE levels were significantly associated with allergen sensitization.

The most extensively produced antibody in the body is IgA. This is primarily due to its extensive production at mucosal surfaces, including the gastrointestinal tract, respiratory tract, and urogenital system, as well as in secretions.[28] IgA is a crucial component of mucosal immunity, functioning by binding to pathogens, microbes, and various substances present on mucosal surfaces. This binding prevents the colonization and penetration of underlying tissues by these pathogens and microbes.[29–31] Furthermore, it is widely recognized that allergen immunotherapy elicits an augmentation in allergen-specific IgG4 and IgA, which are regarded as indicators of immune tolerance development.[32] A multitude of clinical studies have yielded a robust inverse correlation between IgA levels in breast milk and the emergence of atopic diseases.[33–37] These findings suggest that IgA may play an instrumental role in the etiology of allergies.

A history of allergic diseases was documented in 86% of the patient population. A family history of atopic disease was identified in 50% of allergic patients and was found to be significantly associated with allergic sensitization (P = 0.04). A total of 58% of the patients had been exposed to cigarette smoke, and 90% of these patients experienced at least three infections per year. These findings indicate that genetic and environmental elements may have a substantial impact on the onset of allergic diseases.

In some individuals, SIgAD may represent the first or only manifestation of an allergic disease. According to the available literature, approximately 25% of these patients receive a diagnosis during an allergy evaluation.[9,38] In the cases examined, 23% of the subjects presented with an initial symptom of allergy.

The high frequency of allergic diseases in SIgAD patients should be considered. In this study, allergic rhinitis was detected in 69.7% of the patients, asthma in 55%, atopic dermatitis in 32.4%, and a food allergy in 12.7%. Despite the variability of these rates across studies, the extant literature consistently reports a higher prevalence of allergic diseases in SIgAD patients compared to the general population.[18–20,39–56]

The identification of asthma prevalence in 55% supports the hypothesis that SIgAD may contribute to

Table 3 Comparison of the characteristics of patients with selective IgA deficiency with and without allergen sensitization.

Variable	Allergen sensitivity (n = 69)	No allergen sensitivity (n = 41)	P
Demographic and clinical characteristics			
Age (months)	101.5 ± 42.8	107.8 ± 55.9	0.84
Birth weight (grams)	3266 ± 500	3115 ± 549	0.18
Birth week	39.5 ± 1.3	39.5 ± 1.1	0.47
Age of first finding (months)	61.4 ± 45.4	70.4 ± 58	0.67
Number of siblings	1.8 (0-5)	1.74 (0-5)	0.62
Number of people in the house	4.82 (3-8)	4.74 (3-8)	0.69
Number of infections in the last year	6 (2-12)	6 (1-12)	0.94
Hematological and immunological findings			
Eosinophil count (cells/μL)	351 (0-2070)	171 (8-510)	**0.001**
Per cent of eosinophils (%)	4.5 ± 4.3	2.3 ± 1.5	**0.001**
Lymphocyte count (cells/μL)	2898 ± 1138	2958 ± 1388	0.82
Percentage of lymphocytes (%)	36 ± 11.4	34 ± 12	0.32
Neutrophil count (cells/μL)	4127 ± 1987	4980 ± 2263	**0.03**
Percentage of neutrophils (%)	50.7 ± 13.1	55.2 ± 13.4	0.06
Immunoglobulin and specific antibody levels			
IgG (mg/dL)	1419 ± 304	1435 ± 376	0.88
IgA (mg/dL)	2 (0-6)	2 (0-6)	0.94
IgM (mg/dL)	134 ± 56	108 ± 47	**0.01**
Total IgE (IU/mL)	385 (0.2-4272)	72 (0.2-572)	**0.001**
IgG1 (mg/dL)	976 ± 169	962 ± 219	0.8
IgG2 (mg/dL)	298 ± 141	320 ± 176	0.62
IgG3 (mg/dL)	42.4 ± 19	46 ± 31	0.98
IgG4 (mg/dL)	60 (0-277)	50.4 (0-178)	0.48
T-cell and other immune cell subtypes			
CD3 (%)	70 ± 6	71 ± 8	0.37
CD3 count (cells/μL)	1966 ± 822	2089 ± 832	0.4
CD4 (%)	35 ± 5.8	34.1 ± 6.5	0.57
CD4 count (cells/μL)	959 ± 454	1019 ± 408	0.19
CD8 (%)	25.4 ± 5.3	27 ± 6	0.23
CD8 count (cells/μL)	671 ± 271	766 ± 375	0.5
CD19 (%)	15 ± 5	13 ± 4	0.11
CD19 count (cells/μL)	412 ± 225	428 ± 270	0.96
CD16-56 (%)	9 ± 3.3	11 ± 7.2	0.39
CD16-56 count (cells/μL)	276 ± 161	280 ± 146	0.7
Regulatory and memory T cells			
RTE (%)	67.5 ± 10.8	46 ± 13.2	0.77
RTE count (cells/μL)	459 ± 336	504 ± 238	0.08
CD45 RA (%)	73 ± 7.2	70.9 ± 8.3	0.5
CD45 RA count (cells/μL)	1169 ± 900	2240 ± 843	0.09
CD45 RO (%)	24.9 ± 7	27 ± 9.1	0.33
CD45 RO count (cells/μL)	709 ± 264	717 ± 322	0.95
Memory B cells and double T cells			
CD27 IgD (-) (%)	10.7 ± 5.1	17.4 ± 8.1	**0.017**
CD27 IgD (-) count (cells/μL)	44 ± 33	56 ± 44	0.47
CD27 IgD (+) (%)	7.8 ± 4.6	6.6 ± 3.3	0.58
CD27 IgD (+) count (cells/μL)	35 ± 32	17 ± 7	0.17
CD27 IgD (+) (%)	71.1 ± 9.8	56 ± 11.4	**0.002**
CD27 IgD (+) count (cells/μL)	287 ± 180	234 ± 178	0.2
Double T (%)	3.1 ± 1.4	3.1 ± 1.4	0.93
Follow-up data			
Follow-up time (months)	36 ± 33	36 ± 26	

Bold P-values indicate statistically significant differences, with $P < 0.05$. ± represents the mean and standard deviation. Median (min-max) refers to the median value and the range of data (minimum to maximum).
CD: Cluster differentiation; dL: Deciliter; g: Gram, Ig: Immunoglobulin; IU: International unit; max: Maximum; mg: Miligram; min: Minimum; mL: Milliliter; RTE: Recent timic emigrant.

Table 4 Prevalence of allergic diseases by age group in patients with selective IgA deficiency.

Age range (years)	4–5 N:28	6–11 N:57	≥12 N:25
Asthma (%, n)	**64.3 (18)**	28 (16)	36 (9)
Allergic rhinitis (%, n)	60.7 (17)	**80.7 (46)**	**56 (14)**
Food allergy (%, n)	21.4 (6)	14 (8)	4 (1)
Atopic dermatitis (%, n)	25 (7)	35 (20)	24 (6)
Drug allergy (%, n)	0	5.3 (3)	12 (3)

Bold P-values indicate statistically significant differences, with P < 0.05.

Table 5 Allergen sensitization patterns by age group in patients with selective IgA deficiency.

Age range (years)	4–5 N:28	6–11 N:57	≥12 N:25
Dermatophagoides pteronyssinus (%, n)	**35.7 (10)**	**47.4 (27)**	**40 (11)**
Dermatophagoides farinae (%,n)	28.5 (8)	43.9 (25)	36 (9)
Grass pollen (%, n)	21 (6)	17.5 (10)	16 (4)
Tree pollen (%, n)	3.6 (1)	5.3 (3)	4 (1)
Weed pollen (%, n)	7.1 (2)	5.3 (3)	4 (1)
Alternaria (%, n)	17.8 (5)	14 (8)	4 (1)
Cat (%, n)	14.3 (4)	7 (4)	16 (4)
Dog (%, n)	14.3 (4)	7 (4)	0
Cockroach (%, n)	3.6 (1)	3.5 (2)	4 (1)
Milk (%, n)	3.6 (1)	3.5 (2)	0
Egg White (%, n)	**14.3 (4)**	1.8 (1)	0
Egg yolk (%, n)	10.7 (3)	1.8 (1)	0
Peanut (%, n)	7.1 (2)	0	0
Fish (%, n)	7.1 (2)	0	0
Wheat (%, n)	3.6 (1)	0	0
Soybean (%, n)	3.6 (1)	0	0

Bold P-values indicate statistically significant differences, with P < 0.05.

bronchial hyperresponsiveness and increase susceptibility to asthma.[18,38,49-52] Similarly, the prevalence of atopic dermatitis in 32.4% underscores the significant impact of SIgAD on the mucosal immune system. A study of the role of IgA in mucosal immunity revealed that higher levels of salivary IgA-specific antibodies were associated with a reduced risk of late-onset wheezing in infants with sensitization.[57]

A decline in serum IgA concentrations may potentially compromise mucosal barrier integrity, thereby increasing permeability and, in turn, enhancing susceptibility to food allergies.[58,59] Serum IgA and IgG antibodies protect against IgE-mediated systemic anaphylaxis triggered by ingested allergens.[60,61] The present study revealed a higher rate of food allergies in the examined population compared to the general population.

The sensitivity of SPTs is known to vary between countries. A multitude of studies have identified dust mites as the most prevalent allergens, with grass and olive tree pollen, animal dander, and cypress tree pollen following in frequency.[38,32,51] In our study, the most prevalent respiratory allergen sensitization was to Dermatophagoides, followed by grass pollen, Alternaria, dog and cat dander, weed and tree pollen, and cockroaches. Among food allergens, egg white was the most frequently detected sensitization. We believe that regional variations in allergen exposure play a crucial role in the sensitization patterns.

In patients with allergic sensitization, eosinophil counts demonstrated a statistically significant increase (P = 0.001). Conversely, a heightened neutrophil count was identified as a potential limiting factor for allergic sensitization (P = 0.03). These findings might offer further insights into the role of immune cells in allergic inflammation.[62-64]

Serum IgM levels are known to be elevated as a compensatory response to IgA deficiency. In the present study, increased serum IgM levels were found to be significantly associated with allergic sensitization (P = 0.01). This finding suggests that elevated IgM may contribute to the development of allergies when it fails to provide sufficient mucosal protection.[65,66]

The analysis revealed a significant increase in total IgE levels among the allergic group (P < 0.001). It is hypothesized that IgE levels are generally increased in cases of selective IgA deficiency, potentially as a compensatory mechanism to address the reduced IgA levels.[67] Secretory IgA plays a pivotal role in hindering the absorption of allergens into the bloodstream.[68]

In the United States and Western European countries, the prevalence of asthma among children aged 4–6 years is typically reported between 8 and 12%.[69] In contrast, among patients aged 4–5 years with SIgAD, asthma was the most frequently observed allergic disease, with a markedly higher prevalence of 64.3% compared to their healthy peers. The lifetime prevalence of physician-diagnosed allergic rhinitis has been reported as 11.8% in children aged 6–12 years and 53.5% in those aged 13–14 years.[70] In our cohort, allergic rhinitis was the most common allergic condition in patients with SIgAD aged 6–11 and ≥12 years, with prevalences of 80.7 and 56%, respectively, substantially exceeding general population estimates.

Cross-sectional surveys from various countries have indicated that the prevalence of drug allergy in children ranges from 2.8 to 7.8%.[71,72] In our study, we observed a significant age-related increase in drug allergy prevalence (P = 0.04): no cases were seen in the age group of 4–5 years, while rates were 5.3% in the 6–11 age group and 12% among those aged 12 years and above.

The relationship between autoimmune diseases and SIgAD exhibits variability across different populations, with reported prevalence rates ranging from 5 to 30%.[7,20,39,53] In the present study, the prevalence of autoimmune diseases was 23.2%, and this was found to be inversely associated with allergic sensitization. Th1 and Th2 immune pathways maintain a well-established reciprocal balance. Given that the Th1 pathway is more dominant than the Th2 pathway in autoimmune disorders, the lower incidence of atopic diseases in individuals with autoimmune conditions may be attributed to this mechanism.[73]

As with other inborn errors of immunity (IEIs), the management of atopic diseases in patients with SIgAD can

present significant challenges due to the elevated risk of infections and the possibility of autoimmunity. In light of the potential for allergic inflammation to increase susceptibility to respiratory tract infections, current guidelines emphasize the importance of treating allergies in individuals with IEIs, including SIgAD.[74]

Early diagnosis and monitoring of allergies in patients with SIgAD are crucial for preventing chronic diseases and optimizing the quality of life. Patients with a family history of atopy, eosinophilia, elevated total IgE, and increased serum IgM levels should be closely monitored for allergic comorbidities. Future studies should aim to elucidate the pathogenic mechanisms linking IgA deficiency, allergic diseases, and autoimmunity. The findings of this study may offer novel insights for researchers and serve as a source of inspiration for future investigations in this field.

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Authors Contributions

Selami Ulaş and Serdar Al contributed equally as corresponding authors. Each author has contributed to the study's design and concept. Preparation of material, and collection and analysis of data were conducted by all authors. The initial manuscript was drafted by Selami Ulaş and Serdar Al, and all authors provided feedback on previous iterations of the document. The final version was checked and approved by all authors.

Conflicts of Interest

The authors declare no competing interests.

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