Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Medicine

Allergic Rhinitis and Other Allergic and Autoimmune Disorders in Children with IgA Deficiency

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DOI: 10.36347/sjams.2023.v11i06.032 | **Received:** 16.05.2023 | **Accepted:** 25.06.2023 | **Published:** 27.06.2023

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Abstract **Original Research Article**

Background: Selective IgA imunodeficiency is the most frequently occurring primary antibody deficiency. Serum IgA level is decreased or even completly absened, while IgM and IgG antibodies displey normal serum levels. IgA plays an important role in immune protection in the gastrointestinal and respiratory tract. Patients with selective IgA imunodeficiency can be asimptomatic (>50% of cases) and can suffer from recurrent gastointestinal and respiratory infecitions, allergies and autoimmune diseases. Allergic rhinitis (AR) is the most common cause of chronic rhinitis. Characteristic feature of allergic rhinitis is eosinophilic inflammation of the nasal mucosa. Several studied have shown that IgA represents a potent trigger of eosinophil degranulation, while other studies have shown that IgA imunodeficiency is a well-known risk factor for atopy. ***Objective:*** Objective of this study was to evaluate the frequency of allergic rhinitis and other allergic and autoimmune disorders in children with IgA immunodeficiency. ***Methods:*** The study included 36 children diagnosed with IgA imunodeficiency. The presence of allergic and autoimmune disorders was evaluated by specialist of allergology, immunology, rheumatology and otorhinolaryngology. ***Results:*** 22 (71,1%) of children were male and the mean age of the patients was 10.5 years. Among the patients 31 (86,11%) had at least one allergic disease: 20 (55,55%) had asthma, 17 (47,22%) had allergic rhinitis, 6 (16,67%) had atopic dermatitis and 5 (13,89%) had urticaria. 14 (38,89%) had at least one of autoimmune disordes: 8 (22,22%) had reactive arthritis, 5 (13,89%) had juvenile idiopathic arthritis, 2 (5,56%) had Mb Hashimoto and 1 (2,78%) had SLE. ***Conclusion:*** This study showed that the main clinical manifestations in patients with IgA deficiency were asthma and allergic rhinitis. Results also show increased frequencies in other allergic and autoimmune diseases, compared to available data from general population.

Keywords: Allergic rhinitis, autoimmune disorders, children, IgA deficiency.

INTRODUCTION

Selective IgA imunodeficiency is the most frequently occurring primary antibody deficiency that reveals after four years of life. Serum IgA level is decreased or even completly absened, while IgM and IgG antibodies displey normal serum levels. IgA plays an important role in immune protection in the gastrointestinal and respiratory tract [1]. Patients with selective IgA imunodeficiency can be asimptomatic (more than 50% of cases) and can suffer from mild to severe recurrent gastointestinal and respiratory infecitions, allergies and autoimmune diseases. The reason for this heterogeneity in the manifestation of clinical symptoms of the individuals is unknown [2]. The prevalence varies depending on the polulation analyzed. The highest rate is in European Caucasians and the lowest in Asian populations [3,4]. It can occur sporadically, but also autosomal recessive and autosomal dominant inheritace were described [5, 6].

Allergic rhinitis (AR) is the most common cause of chronic rhinitis and its prevalence rate is between 23 and 30% in Europe [7]. Prevalence rate of AR in croatian children is up to 20% [8]. Characteristic feature of allergic rhinitis is eosinophilic inflammation of the nasal mucosa. Large quantities of eosinophils, neutrophils, mononuclear cells, and basophils migrate into the nasal mucosa during a late-phase nasal allergic reaction, which peaks 6–12 hours after a nasal allergen challenge [9]. Several studied have shown that IgA represents a potent trigger of eosinophil degranulation

[10], while other studies have shown that IgA imunodeficiency is a well-known risk factor for atopy [11]. However, more studies about the mechanisms by which IgA can prevent or modulate AR still need to be performed. Our aim of the study was to evaluate the frequency of allergic rhinitis and other allergic and autoimmune disorders in children with IgA imunodeficiency.

MATERIALS AND METHODS

The study included 36 children diagnosed with IgA imunodeficiency. Patients underwent medical examination by specialists of allergology, immunology, rheumatology and otorhinolaryngology, who made the final diagnosis of allergic and autoimmune disorders after a diagnostic workup. Diagnosis of IgAD was based on low or absent serum IgA level less than 0.07 g/l (< 70 µg/ml), in patients older than 4 years old [12]. Data about presence of allergic and autoimmune disorders and levels of immunoglobulins were then entered into a computer and analyzed. Statistical analyses were performed using IBM SPSS Statistics version 19.0.0.1. Basic descriptive summaries of the data were obtained.

RESULTS

Twenty-eight children had selective IgA imunodeficiency and eight children had combined IgA and IgG imunodeficiency. Twenty-two (71,1%) of children were male and the mean age of the patients was 10.5 years. Among the patients 31 (86,11%) had at least one allergic disease: 20 (55,55%) had asthma, 17 (47,22%) had allergic rhinitis, 6 (16,67%) had atopic dermatitis and 5 (13,89%) had urticaria. 14 (38,89%) had at least one of autoimmune disordes: 8 (22,22%) had reactive arthritis, 5 (13,89%) had juvenile idiopathic arthritis, 2 (5,56%) had Mb Hashimoto and 1 (2,78%) had SLE (Figure 1).

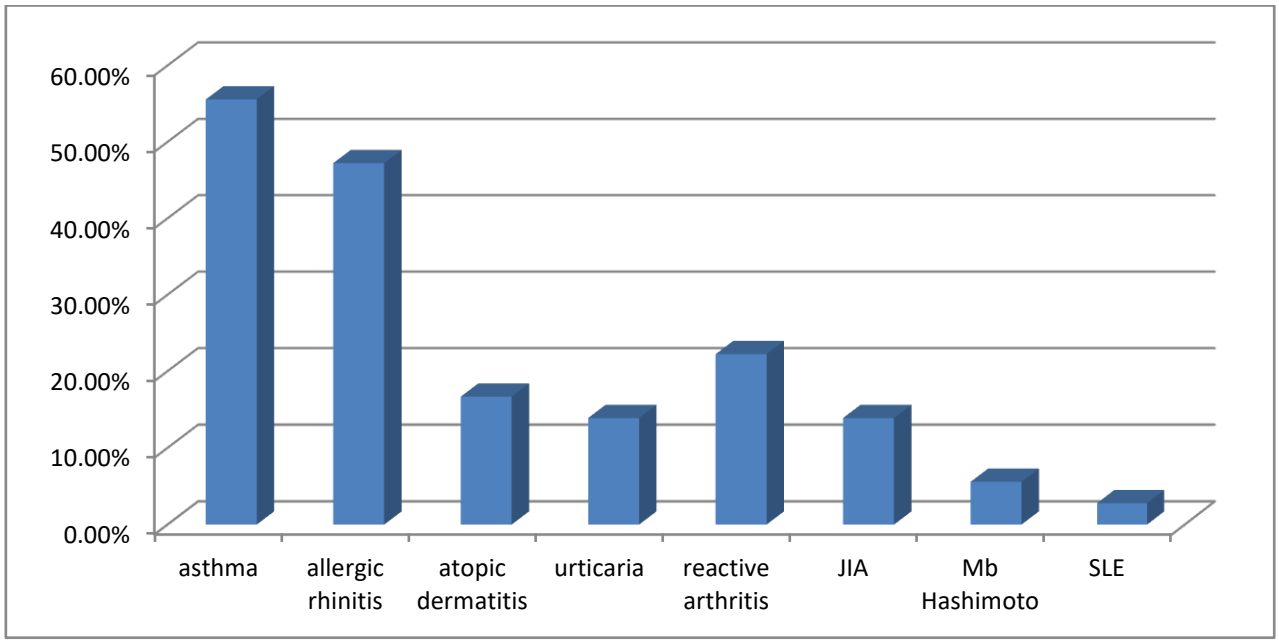

Figure 1: Association IgA deficiency with allergic and autoimmune disorders in children

DISCUSION

IgA deficiency prevalence is variable in different ethnicities across the world: from 1:143 in the Arabian peninsula [13], 1:163 in Spain [14], 1:252 in Nigeria [15], 1:875 in England [16], 1:965 in Brazil [17] and from 1:2,600 to 1:5,300 in China [18]. The highest rate is in European Caucasians and the lowest in Asian populations [3,4]. The genuine prevalence rates are probably higher becouse patients with selective IgA imunodeficiency can be asimptomatic (more than 50% of cases) and can suffer from mild to severe recurrent gastointestinal and respiratory infecitions, allergies and autoimmune diseases. Unfortunately, there is no established routine screening program for IgA deficiency [13].

Several studies have demonstrated that IgA deficiency and allergy are associated and that allergic diseases may be the first and/or only clinical manifestation in some patients with SIgAD. A significant part (up to 25%) of patients with IgA deficiency is identified during an allergy evaluation [13]. Higher prevalence rates of allergic diseases in sIgAD patients have been confirmed in several studies [13, 19]. Prevalence rates differ from 13 to 84% [20, 21]. In more recent studies in Italy, allergic manifestations were recorded in 39% of 184 and 38% of 103 patients living with SIgAD [22,23]. The allergic diseases most commonly associated with IgAD are allergic conjunctivitis, rhinitis, urticaria, eczema, foodallergy and asthma [24], In our study data showed that the main clinical manifestations in patients with

IgA deficiency were asthma (55,55%) and allergic rhinitis 17 (47,22%) while in the Croatian pediatric population prevalence rates of allergy diseases are lower (asthma 8.31%, rhinitis 16.24%) [8]. These observations refer the need for screening patients for allergies after sIgAD has been established.

The most important clinical manifestations in IgA deficiency are autoimmune diseases [13]. Edwards *et al*. in a 2004 study showed that the second most common association with IgA deficiency was autoimmunity (28%) [20]. According to Azizi *et al*. the prevalence of autoimmune disease in this group of patients is 31.7% [25]. Autoimmune diseases with higher prevalence are systemic lupus erythematosus, hypo- and hyperthyroidism, type 1 diabetes mellitus, Crohn's disease, ulcerative colitis, rheumatoid arthritis, juvenile idiopathic arthritis, ankylosing spondylitis, and vitiligo [19]. In our study 8 (22,22%) of pateients with IgA deficiency had reactive arthritis, 5 (13,89%) had juvenile idiopathic arthritis, 2 (5,56%) had Mb Hashimoto and 1 (2,78%) had SLE.

The prevalence rate of reactive arthritis in population-based studies is reported to be 0.6 to 27 per 100,000 and for juvenile idiopathic arthritis is 43.5 per 100 000 (26, 27). These observations also refer the need for screening patients for autoimmune diseases after sIgAD has been established. This study showed that the main clinical manifestations in patients with IgA deficiency were asthma and allergic rhinitis. Results also show increased frequencies in other allergic and autoimmune diseases, compared to available data from general population. These results refer the need for screening patients for allergic and autoimmune diseases after IgAD has been established.

Acknowledgments

The authors would like to thank to all children and parents who participated in this study.

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