Epidemiological study of allergic rhinitis in a population of children seen at the Department of Pediatrics of a general hospital. Cross-sectional study

Natalia A. Petriz^a 6, Carolina Antonietti^a 6, Cecilia Parente^a 6, Claudio A. S. Parisi^a 6

ABSTRACT

Introduction. Allergic rhinitis (AR) is one of the most frequent chronic diseases in the pediatric population; it affects the quality of life of children and their families, has economic impact, and is frequently underdiagnosed and undertreated. Given the scarcity of local data, here we describe the prevalence of AR and the clinical characteristics of the study population.

Population and methods. Observational, cross-sectional study in patients younger than 19 years.

Results. A total of 250 patients were randomly included; their mean age was 9 years (SD: 5). AR was diagnosed in 14 of them. The prevalence of AR was 6%.

Conclusions. The prevalence of AR in our setting was 6%. AR should be given the relevance it deserves so as to provide an adequate diagnosis and treatment.

Keywords: allergic rhinitis; prevalence; child.

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^a Hospital Italiano de Buenos Aires, City of Buenos Aires, Argentina.

Correspondence to Natalia Petriz: natalia.petriz@hospitalitaliano.org.ar

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INTRODUCTION

Allergic rhinitis (AR) is a global health problem that affects between 10% and 40% of the population, with a prevalence of 8.38% in children and 14.93% in adolescents.^{1,2} It is the most common childhood allergic disease.^{1,2} It is a disorder caused by inflammation of the nasal mucosa, characterized by the presence of 1 or more of the following symptoms: nasal congestion, itching, sneezing, rhinorrhea, and post-nasal drainage.³

Given the scarcity of data in our setting, we set out to describe the prevalence of AR in children and adolescents through an observational, crosssectional study.

OBJECTIVE

To describe the prevalence of AR and the clinical characteristics of the study population.

POPULATION AND METHODS

An observational, cross-sectional study was conducted between 1/1/2015 and 1/1/2020 in patients younger than 19 years who were members of the medical care program of Hospital Italiano de Buenos Aires (PMHI), Argentina. The pediatric population in this healthcare coverage system includes approximately 20 000 members who mainly have a middle-income status and most of whom live in urban areas of the City of Buenos Aires and Greater Buenos Aires. All the medical care of members is recorded centrally in an information data repository, which includes an electronic medical record.

Patients younger than 19 years as of 1/1/2020 who were active members of the PMHI between 1/1/2015 and 1/1/2020 and who received followup for at least 6 months were included. A case of AR was defined as any patient diagnosed with AR as per a clinical picture characterized by the presence of 2 or more of the following symptoms: sneezing, nasal itching, rhinorrhea, and nasal obstruction, and a positive test that determined allergen sensitivity (increased specific IgE for aeroallergens: greater than 0.35 IU/mL or positive skin prick test for aeroallergens: diameter equal to 3 mm or larger compared to the negative control). Pediatric allergy specialists reviewed the medical records of detected cases and confirmed those that met the operational definition of AR.

For the purpose of describing the characteristics of AR during the study period, for an expected frequency of 20%,^{4.5} a semi-amplitude of 0–5%, and a 95% confidence, a

total of 246 medical records were included. The sample size was estimated using the Open Epi software. A random sampling of patients who met the inclusion criteria was performed. Based on the reported sample size calculation, 250 medical records were obtained from pediatric patients who were active members of the medical care program of Hospital Italiano between 1/1/2015 and 1/1/2020. These patients must have been members of the program for at least 6 months. The prevalence of AR during the period described was calculated using the total number of medical records assessed as the denominator; it was expressed as a proportion and its confidence intervals, respectively. The primary study data collection was performed by those sub-investigators in charge of data capture and collection, through the retrospective assessment of the medical records of patients included in the list and distributed randomly.

The study was approved by our hospital's Ethics Committee and conducted in full compliance with the Declaration of Helsinki and the local Good Clinical Practice guidelines (law no. 3301 CABA, resolution 1490).

RESULTS

A total of 250 patients with a median age of 9 years (SD: 5) were included in the study; 50% (126) were female.

Of the 250 patients assessed, 26 were diagnosed with rhinitis and, of these, 14 had AR. The overall prevalence of rhinitis was 10% (95% CI: 6–14) and of AR, 6% (95% CI: 3–9). The mean age at the time of AR diagnosis was 9 years (SD: 5). Of the 14 patients with AR, 9 were male and 8 developed persistent moderate/severe disease.

Table 1 describes the clinical characteristics of patients with AR. *Table 2* describes the treatments given to patients with AR.

DISCUSSION

This study found that the prevalence of AR was 6%, compared to a cross-sectional survey conducted in Argentina in 2019, the PARA study,⁴ conducted in patients aged 5 to 19 years, which found that 22.3% had AR. Such difference may be due to the different methodologies used; the telephone survey may have overestimated the prevalence due to self-reporting of rhinitis without a medical diagnosis or could have also corresponded to regional differences. The collaborative study known as the International Study of Asthma and Allergies in Childhood

TABLE 1	Clinical	characteristics	of	natients	with	allergic	rhinitis
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Characteristics		N = 14
Allergic rhinoconjunctivitis		4
Nasal pruritus		7
Bursts of sneezing		14
Rhinorrhea		12
Nasal obstruction		11
Anosmia		0
Symptoms all year round		9
Intermittent	Mild	4
	Moderate/severe	0
Persistent	Mild	2
	Moderate/severe	8
Comorbidities	Atopic dermatitis	1
	Asthma	5
	Food allergy	1
	Polyps	1
Family history		10
Eosinophilia		1
Positive skin prick test	Mites	13
	Grass	0
	Trees	2
	Weeds	1
	Dog	1
	Cat	5
	Cockroach	1
	Alternaria	5
	Other fungi	1
Pets		7
Dampness		1
Exposure to tobacco		1

N: number.

TABLE 2. Treatments given to patients with allergic rhinitis

Treatment	N = 14
Immune therapy	4
Intranasal corticosteroids	6
Second-generation antihistamines	3
Montelukast	2

N: number.

(ISAAC) showed that the frequency of AR is 8.38% in children and 14.93% in adolescents, and also that there is a wide variation in prevalence across countries.² These regional variations are attributed to differences in population size and environmental factors —such as humidity, climatic changes, urban growth, pollution, or socioeconomic conditions—, which even change over time.^{5–8} In a Mexican study carried out by García-Almaraz et al, different prevalences were observed in different cities of Mexico and how they increased from 2016 to 2019: in adolescents, from 26.2% to 37.5% and in school children, from 17.9% to 24.9%, respectively, being much higher than in our population.² In contrast, in a study conducted in Brazil, the prevalence of AR in children was 12.9% in 2007 and 4.9% —similar to our results— in 2017; a decrease in its frequency was observed over time.⁹

In our study, it was observed that, of the 6% of patients who had AR (14 patients), 8 had moderate to severe persistent AR. Severity is

often underestimated and, therefore, not treated; however, approximately half of our population was treated with intranasal corticosteroids, which is appropriate for this level of severity according to international guidelines and diagnostic consensuses.¹⁰

The duration and severity of symptoms affect the quality of life and cause a detrimental effect on daily activities, sleep quality, and cognitive function. In addition, AR is frequently associated with comorbidities, such as asthma and atopic dermatitis, among others.^{2,3} In this aspect, it is worth noting that of the 14 patients with AR, 5 had asthma. Pathophysiologically, rhinitis and asthma are based on the concept of the "united airway disease;" rhinitis is a risk factor for developing asthma and the latter increases at least twofold the risk of having AR in children and adolescents.¹¹ Forty percent of patients with AR have asthma, whereas 80% of asthma patients have AR. An optimal management of AR could improve coexisting asthma.10

The prevalence of AR observed in our setting cannot be considered representative of the population; multicenter studies are required. In addition, the patients were seen by pediatricians specialized in allergy and immunology, trained in the diagnosis and management of AR, which is considered a strength in terms of diagnostic accuracy for the measurement of its prevalence.

CONCLUSION

The prevalence of AR was 6%. It is important to consider AR in order to take measures for its prevention, diagnosis, and treatment, as well as to prevent comorbidities and improve the quality of life of our patients. ■

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