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Allergic rhinitis management: a survey on Italian primary care pediatricians

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KEY WORDS

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IMPACT STATEMENT

This survey demonstrated that ARIA guidelines are commonly followed by Italian primary care pediatricians. Intranasal corticosteroids, antihistamines, and nasal lavage are common treatments used for children with allergic rhinitis.

Summary

Background. Allergic rhinitis (AR) is a widespread condition. The Italian Society of Pediatric Allergology and Immunology (SIAIP) promoted an initiative to update the knowledge on AR in children and adolescents. The present survey directly addressed primary care pediatricians, thus reflecting the real-world management of AR in children and adolescents. The aim was to investigate common practice in managing AR children. **Methods.** A panel of experts drafted a series of questions concerning the practical management of children with AR in clinical practice. The questionnaire was administered to a large sample of primary care pediatricians ($n = 864$). **Results.** 864 primary care pediatricians participated to the survey. Each pediatrician on average follows 94 children with AR; globally 81,231 children. More than 70% of participants follow ARIA guidelines. Accordingly, 42% of children have mild AR and 58% moderate/severe. Asthma, conjunctivitis and adenoid hypertrophy are the most common comorbidity. Most pediatricians autonomously follow their patients. The intensity of treatment (use of medication) is directly proportional to the symptom severity. Intranasal corticosteroids are the most common medication used followed by oral antihistamines and nasal lavages (with hypertonic or isotonic solution). Up to 20% of participants prescribed the fixed association topical corticosteroids plus antihistamine. **Conclusions.** The present survey demonstrated that Italian primary care pediatricians accomplish ARIA guidelines and adapt treatment on the basis of the intensity of symptoms. Corticosteroids and antihistamines are the most common prescribed medications. Nasal lavages are also popular.

Introduction

Allergic rhinitis (AR) is a widespread disease in childhood and adolescence, as a recent meta-analysis reported a 20% prevalence (1). Moreover, AR significantly affects quality of life and burdens on family and society costs (2). Allergic rhinitis recognizes a type 2 immunity that promotes eosinophilic inflammation (3). Type

2 inflammation closely depends on allergen exposure, leading to typical symptoms, including itching, sneezing, watery rhinorrhea, and congestion (4).

Traditionally, AR classification defines two phenotypes, depending on the duration of the symptoms, such as seasonal AR and perennial AR. Almost 25 years ago, the allergic rhinitis and its impact on asthma (ARIA) initiative defined two distinct pheno-

types based on the duration and intensity of symptoms (5). In particular, symptom severity is classified as mild or moderate/severe, considering their impact on daily activities and quality of life (5). Later, the ARIA document has been partially adapted also for the pediatric population (6).

The management of AR patients relies on pharmacological remedies, mainly on antihistamines and corticosteroids. The choice of the administration route, dosage, and duration should consider the symptom severity, usually self-measured by a visual analog scale (7). Also, AR management should contemplate asthma comorbidity as the association of AR and asthma identifies a distinct disease (8). Both disorders are closely related, and adequate AR treatment *per se* improves asthma (9).

A previous Italian survey investigated the features of allergic rhinitis in children and the prevalence of ARIA phenotypes (10). This survey involved 35 pediatric allergy centers throughout Italy and included data from 2,623 patients. The results confirmed the adequacy of ARIA classification and treatment failure in patients with severe AR.

More than ten years have passed since this survey, and the COVID-19 pandemic significantly affected healthcare, so a new Italian survey has been advanced. The Italian Society of Pediatric Allergology and Immunology (SIAIP) promoted an initiative to update the knowledge on AR in children and adolescents. In particular, the present survey directly addressed primary care pediatricians, thus reflecting the real-world management of AR in children and adolescents.

Materials and methods

A group of experts on AR management drafted a questionnaire to administer to pediatricians. The survey comprised questions concerning the doctor's age, geographical area of work, patient characteristics, and practical AR management. In particular, adherence to ARIA guidelines, consultations with allergologists and otorhinolaryngologists, comorbidity assessment, and medication use were considered. The questionnaire was previously validated by the SIAIP (10).

The survey included a panel of randomly selected Italian primary care pediatricians, guaranteeing a representative sample of the whole country.

Table I reports the questions. **Table II** reports the detailed classes of medications used in the questionnaire. Table III includes the main comorbidities investigated.

The questionnaire was administered in paper form, collected, and sent for processing. The collection was handled to ensure full anonymity of responses. The administration selected pediatricians who usually consult the second- or third-level allergy centers homogeneously distributed along the entire national territory. For this purpose, the group of experts invited the chiefs of these centers to select the most cooperative pediatricians.

Table I - Questions included in the survey.

Questions
How old are you
What geographic area do you work in
How many children (approximate absolute number) with Allergic Rhinitis do you visit each year?
Do you follow ARIA guidelines in your clinical practice?
If yes, how many children (%) have the mild form?
Do you manage them independently?
Do you also send them to the Allergist?
Do you also send them to the ENT specialist?
What medications are you currently prescribing to your patients with mild AR?
How many patients do you have with moderate-severe allergic rhinitis?
Do you manage them independently?
Do you also send them to the Allergist?
Do you also send them to the ENT specialist?
What medications are you currently prescribing to your patients with moderate/severe AR?
What are the main comorbidities observed?
How many children (approximate absolute number) with asthma do you visit each year?
How many (%) of these do you send to a Referral Center?
Do you think rhinitis treatment also improves asthma?
Have you ever used the combination Azelastine/Fluticasone nasal spray?

Table II - The most common comorbidities investigated by primary care pediatricians.

Comorbidity	%
Asthma	64.9
Conjunctivitis	58.1
Adenoid hypertrophy	55.6
Sleep disorders	53.7
Chronic rhinosinusitis without nasal polyps	38.1
Tonsil hypertrophy	19.1
Chronic rhinosinusitis with nasal polyps	13.5
Other	1.7

The statistical analysis was descriptive, and data were expressed as absolute numbers, means, or percentages.

Results

The survey included 864 Italian primary care pediatricians. The mean age was 57.1 (ranging from 31 to 76). Regarding the geographic area where they work, 31% work in Northwest Italy, 26% in Northeast Italy, 22% in central Italy, and 21% in South Italy and Islands.

The pediatricians visit 95 children with AR on average yearly. As a result, the total number of children with AR managed by the participants was 81,231; 39,561 (48.7%) were preschoolers, and 41,670 (51.3%) were schoolers.

Most primary care pediatricians (71.6%) adopt the ARIA guidelines in their clinical practice. Regarding the severity of AR symptoms, 34,392 (42.3%) children had mild AR, and 46,839 (57.7%) had moderate/severe AR.

The main comorbidities were asthma in 64.9% of children, conjunctivitis in 58.1%, adenoid hypertrophy in 55.6%, sleep disorders in 53.7%, chronic rhinosinusitis without nasal polyps (CRSsNP), tonsil hypertrophy 19.1%, chronic rhinosinusitis with nasal polyps (CRSwNP), and other in 1.7%.

Primary care pediatricians visit an average of 63 children with asthma per year. The total number of children with asthma visited yearly was 54,302; 23,546 (43.4%) were referred to a specialistic center. Most pediatricians (91%) are convinced that AR treatment also improves asthma.

Mild AR

In children with mild AR, 704 (81.5%) pediatricians managed autonomously; 66.3% consulted an allergist, and 52.8% also had an ear, nose, and throat (ENT) specialist.

Regarding the currently prescribed treatments (**table III**), 77% of participants use intranasal corticosteroids, 68.2% oral antihistamines, 54% hypertonic saline solution, and 46% isotonic saline solution, 10.6% the fixed combination intranasal antihistamine plus corticosteroid, 5.6% antileukotriene, 4.2% oral corticosteroids, and 1.5% chromones; 5% also used other treatments. The answers could be multiple.

Moderate-severe AR

In children with mild AR, 474 (55%) pediatricians managed the children autonomously; 81% consulted an allergist, and 64% an ear, nose, and throat (ENT) specialist.

Regarding the currently prescribed treatments (**table III**), 86.5% of participants use intranasal corticosteroids, 79.2% oral antihistamines, 50.1% hypertonic saline solution, and 36.6% isotonic saline solution, 20.7% the fixed combination intranasal antihistamine plus corticosteroid, 14.9% antileukotriene, 14% oral corticosteroids, and 1.5% chromones; 5.4% also used other treatments. The answers could be multiple.

Discussion and conclusions

The Italian health service guarantees every citizen primary care with the assignment of a doctor. For the pediatric age group (0-14 years), each child is followed by a pediatrician. Each primary care pediatrician may care for up to 880 children except for 120 patients with “expiring cards” (*i.e.*, residents in neighboring areas, non-residents, and non-EU citizens). The current number of Italian primary care pediatricians is 6,962 (early June 2024), and the pediatric population is about six million seven hundred thousand children. As a result, each primary care pediatrician follows 960 children.

Table III - Medications used for children with mild or moderate/severe allergic rhinitis (AR).

Pharmacological class	Mild AR (%)	Moderate/severe AR (%)
Intranasal corticosteroids	77	86.5
Oral antihistamines	68.2	79.2
Hypertonic saline solution	54	50.1
Physiologic saline solution	46	36.6
Nasal decongestants	25.4	25.7
Nasal antihistamine/corticosteroid	10.6	20.7
Antileukotriene	5.6	14.9
Oral corticosteroid	4.2	14
Chromones	1.5	1.5
Other	5	5.4

The present survey included 864 primary care pediatricians, with a mean age of 57, which is in line with the average age of general practitioners, which is 60.

The sample of children followed by these doctors is approximately 750,000 subjects. As a result, the mean AR prevalence is about 11%. This result may be underestimated compared to the prevalence in the literature (about 20%). Still, it is well known that many AR patients do not seek medical care or do so occasionally (1).

Interestingly, most participants (72%) implement ARIA guidelines in clinical practice. This finding is consistent with a recent survey conducted on Philippine doctors, which reported that the majority of respondent physicians (77%) used the ARIA guidelines for the diagnosis and management of AR (11).

Regarding AR comorbidities, asthma is the most prevalent comorbidity, as about 65% of children with AR also have asthma. This finding confirms previous studies conducted on Italian children. Namely, a multicenter initiative promoted by SIAIP (Control'Asma) pointed out that 88% of asthmatic children had AR (12-14). However, a previous Italian survey reported a prevalence of asthma of 40% in children with AR (10). Another Italian multicenter study reported an asthma comorbidity of 39% in children with pollen-induced rhinitis (15). However, both studies were performed in early 2010. On the contrary, a survey conducted on 100 primary care pediatricians confirmed an asthma prevalence of 10% and frequent AR comorbidity (> 50%) in about 70,000 Italian children (16). Lastly, a very recent monocenter study reported asthma comorbidity in 67% of children with AR (17).

Allergic conjunctivitis affected about 58% of AR children; this finding consists of a recent review that reported a quote of association ranging from 30 to 71% (18).

Adenoid (mostly) and tonsil hypertrophy represent common comorbidities in children with AR, as widely reported in the literature. Both conditions contribute to affecting airflow and infection susceptibility (19, 20). Chronic rhinosinusitis frequently affects children with AR as AR is a predisposing factor for sinus inflammation (21, 22). However, an interesting outcome provided by the present survey was the high comorbidity of nasal polyps as reported in 13.5% of subjects. This finding is conflicting with previous studies reporting a low prevalence in children (23). This result deserves adequate in-depth analysis and requires confirmatory studies.

Finally, sleep disorders are common comorbidity and often a consequence of AR, as widely reported in the literature (24, 25). All these comorbidities contribute to increasing the burden of AR in children and their families.

As regards the symptom severity assessed according to ARIA guidelines, 42% of children had mild symptoms and 58% moderate-severe. The previous study conducted in 35 Italian pediatric allergy centers showed that 55.9% of children with AR had mild and more than 40% moderate-severe symptoms (10). Similarly,

another Italian multicenter study reported a prevalence of 48.9% for mild symptoms and 51.1% for moderate-severe (15). The present survey reported a higher prevalence of moderate-severe symptoms, probably because the severity of AR could increase in the population over time. Further studies should address this issue. Regarding treatments, the present survey demonstrated that intranasal corticosteroids were the most common medications for managing children with AR. The second pharmacological class concerned oral antihistamines. Nasal lavages are common, mainly using hypertonic solutions. Surprisingly, 25% of participants declared to prescribe decongestants for treating AR. Italian Agency for Drugs (AIFA) contraindicated decongestants in children aged less than 12 years. Probably, many participants have misinterpreted the meaning of decongestants by also considering products that are not α -adrenergic but can reduce nasal congestion (*e.g.*, glycyrrhetic acid, hypertonic compounds, mechanical devices, balsams).

Participants used more drugs in moderate-severe patients than in mildly symptomatic patients. Comparing these results with the previous Italian survey, the present survey showed a higher use of intranasal corticosteroids than oral antihistamines, the opposite of the last study. However, it is necessary to point out that the percentage of doctors prescribing a particular therapeutic class in the present study is investigated. In contrast, the previous research directly analyzed how many children used that specific therapeutic class. Thus, the results cannot be directly compared. However, this comparison may explain why most primary care pediatricians consider it important to use corticosteroids. As evidence of the different contextualization of the results, a recent study showed that in a group of children with suspected AR sent to a specialist center, the use of oral antihistamines was significantly higher than that of topical corticosteroids, such as 50% *versus* 16% (17).

Finally, the fixed combination of topical antihistamine plus corticosteroid represents a common option for participants, mainly if children have moderate-severe symptoms. Comparing this option with the previous study is not possible as it was unavailable at that time. Notably, this association is indicated only after 12 years of age. However, there is evidence that it is effective also in younger children (26).

The present survey had some limitations, including the collection of personal opinions, the lack of objective measures, and mostly the absence of clinical data. In addition, it has to be noted that no explanation was given to participants on the diagnostic criteria for the different diseases and their severity as the aim of the survey was to define the current knowledge on this issue without affecting it. However, this partial lack of standardization of answers could represent a potential limitation of the outcomes. Another potential limitation was the selection of participants based on a personal choice of chiefs of second/third-level allergy centers along Italy. This choice could not mathematically represent

the exact number of pediatricians working in the different geographical areas. Namely, regional differences in healthcare practices and access could introduce a potential bias. Moreover, the invited pediatricians might have a particular interest in allergic rhinitis management, potentially skewing the results towards those who are more knowledgeable or proactive in managing AR. As a result, further surveys could investigate this interesting aspect. Furthermore, it has to be considered that the results were reliant on self-reported data from interviewed pediatricians. This method could introduce a possible bias, as primary care pediatricians may over-report adherence to guidelines or perceived effectiveness of treatments, especially if they believed their responses may be scrutinized. Finally, the results may imply a potential for over-generalization as the conclusion drawn about the general adherence to guidelines and management practices may not be universally applicable across different clinical settings or pediatric populations. For this reason, future studies should sample diverse geographic and demographic contexts to confirm and reinforce the present findings.

However, this survey involved more than 800 primary care pediatricians managing more than 80,000 children with AR. Thus, the results provided robust outcomes that also reflected what happens in the real world. Further studies should confirm these findings, adopting adequate methodology. Accordingly, a schematic representation of practical management performed by primary care pediatricians is schematically represented in **figure 1**. In conclusion, the present survey demonstrated that most Italian primary care pediatricians adopted ARIA guidelines, most children complained of moderate-severe symptoms, asthma was common comorbidity, intranasal corticosteroids and oral anti-

histamines were first-level choices, and intranasal antihistamine plus corticosteroid was a frequent therapeutic option, mainly in subjects with moderate-severe symptoms.

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Contributions

GC: conceptualization, writing – original draft. CI: writing – review & editing. GLM, MMdG, MAT, AMZ: supervision.

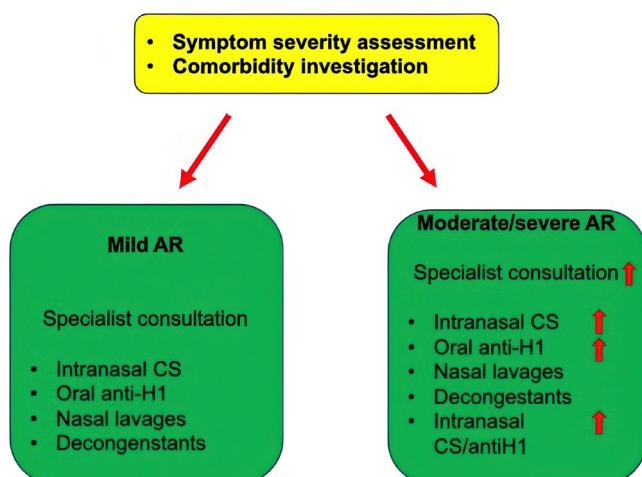
Conflict of interests

The authors declare that they have no conflict of interests.

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Figure 1 - Schematic scenario for AR management in the primary care setting.



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