

# Initial Management of Allergic Rhinitis in the Community—Could It Be Expanded?

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## Abstract

**Objectives:** To analyze the initial investigation and management of allergic rhinitis (AR) patients in general practice and determine if it could be expanded further.

**Methods:** Clinical letters of patients with a diagnosis of AR seen in our outpatient's department for the past 5 years were retrospectively reviewed. We have confirmed the diagnosis when possible, with allergy tests.

**Results:** From 555 patients included in our study, 90.6% were referred by their general practitioner (GP). Male to female ratio was 1.7. Almost half of the patients presented with nasal congestion had typical AR symptoms. A positive personal history of atopy was present in 19% of cases. Only 4% of GPs performed nasal examination on their patients. One hundred and five patients (19%) were prescribed nasal sprays, but they neither received instructions on the technique nor were told to use them long term. Twelve percent of the cases had allergy testing done prior to our clinic assessment, which confirmed allergen sensitization in 82% of these cases.

**Conclusions:** More efficient triaging and initial management of GP and otolaryngology referrals for rhinitis could result in fewer patients needing hospital management. We propose an instruction manual for GP suggesting initial appropriate and consistent topical therapy for at least 3 months, particularly in patients with a positive personal or family history of atopy, who have also been instructed in allergy avoidance. Those who fail should have allergy testing done or an alternative diagnosis considered.

**Keywords:** allergic rhinitis, atopy, nasal spray, paediatric, skin allergy testing.

## INTRODUCTION

Allergic rhinitis (AR) is a common disease affecting between 10 and 30% of adults and 40% of children.<sup>1,2</sup> The prevalence of allergic diseases is increasing worldwide in the last decades.<sup>1</sup> AR is associated with a significant economic burden on both patients and society.<sup>3,4</sup> A clear increase in disease specific costs was observed with the severity of AR and AR associated with asthma.<sup>5</sup>

The prevalence of AR is different in the general population when compared with the general practitioner (GP) setting. A systematic review reported the difference to be up to 15 times higher in the general population.<sup>6</sup> The GP needs to be familiar with AR presenting symptoms, guidelines for investigation, treatment, and common allergens in their area of practice.<sup>7</sup> International guidelines and consensus for AR and asthma are continuously updating.<sup>8</sup>

Patients experience AR symptoms after being exposed to sensitizing allergens and produce allergen-specific immunoglobulin E (IgE). This is a type I hypersensitivity reaction. Most commonly, children present with symptoms highly suggestive of AR: nasal obstruction, nasal itching, rhinorrhea, and sneezing. As per the allergic rhinitis and its impact on asthma (ARIA) guidelines, AR is defined by at least one of the above-mentioned symptoms.<sup>8</sup> Although rare, some patients still present with the classical AR signs of "allergic salute" and "nasal crease" as observed by the authors.

History and the nasal examination are the key diagnosis features. The triggering allergen is easily identified from the patient's history. While symptoms presenting at night or morning suggest an indoor allergen, a seasonal variation suggests a pollen-related reaction. Of note, many patients are polysensitized with symptoms presenting all year-round and spring-summer exacerbations. Anterior rhinoscopy with a torch is sufficient to reveal the pale nasal mucosa of the enlarged, obstructive inferior turbinates.

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Investigations for the offending allergen are neither routinely necessary nor performed. Testing is useful when the sensitizing allergen is hard to identify, for avoidance measures or when immunotherapy is considered in resistant cases. Identifying the allergen-specific IgE response is performed via skin prick allergen (SPAT) or serum allergen-specific IgE testing (SASIgET). Testing with either technique depends on the availability and clinical setting. SPAT is preferred for its low cost, the rapidity of performance, and results (20 minutes). The patient is counseled about the positive results at the same visit. A wide range of allergens can be tested via SPAT. In comparison, SASIgET neither requires training nor is influenced by the geographical and seasonal variation or antihistaminic medication.

AR treatment is based on allergen avoidance measures and medical therapy. Monotherapy with either an intranasal corticosteroid or antihistamine medication is advised in mild symptomatic cases. For moderate-to-severe symptoms, both an intranasal corticosteroid and an antihistamine should be prescribed. Leukotriene-receptor antagonists and allergen immunotherapy are the next treatment strategies for severely affected patients.<sup>8</sup> Surgical interventions aiming at the reduction of inferior turbinates have a limited role in poorly controlled symptomatic patients. Most patients seeking medical care have moderate-to-severe AR symptoms.<sup>4,9</sup>

The “one airway, one disease” concept is well illustrated in allergic children. An increased risk of asthma in preadolescence, adolescence, and adult life was strongly correlated with childhood AR.<sup>10</sup> Mites sensitization was associated with an increased risk of asthma.<sup>11</sup> Severe AR seems to be the most important risk factor for poorly controlled asthma.<sup>12</sup> As primary care physicians, GPs need to be aware of the atopic pattern. These patients visit their GP more often and get more atopic and nonatopic prescriptions (4.7-12.5%) than nonatopic children (2.8-3.1%).<sup>13</sup>

General practices were targeted worldwide for the evaluation of AR management. Results suggest an underdiagnosis, misdiagnosis, and suboptimal treatment of AR in these healthcare settings.<sup>14,15</sup> In a national UK-based audit on GPs with self-declared allergic interest, only 14% of the GPs satisfied all the criteria for the identification of AR. Results were disappointing regarding the examination, investigation, or adequate treatment of AR, with 0-0.6% of the GPs satisfying all these criteria.<sup>14</sup> Price et al. found that both seasonal and nonseasonal AR patients are ineffectively treated in the UK general practice, with insufficient monotherapy at the beginning of the pollen season or multitherapy that needed to be adjusted.<sup>15</sup> It is clear that a better understanding of AR and patient’s needs alongside with efficient treatment is mandatory in the community setting.

We have investigated the initial management steps for AR patients undertaken by their GP before referral to our specialist clinic. A second

aim of the study was to audit our practice in terms of AR diagnosis, investigations, and management, both medical and surgical.

## METHODS

We retrospectively investigated our electronic database for suspected AR patients seen in our department. This study was run over 5 consecutive years, between January 2015 and December 2019. Our hospital is a tertiary pediatric referral center within the largest urban area in Ireland.

We have used the search term “allergic rhinitis.” The clinical letters and laboratory investigations results stored in a password-protected encrypted network on the hospital intranet have been reviewed.

Patients referred with rhinitis or other related symptom by their GP and other healthcare professionals, who after review at our clinic had a diagnosis of AR, were included. Missing or incomplete patient’s data were a reason for exclusion. We have excluded patients with a previous diagnosis of AR and well-controlled symptoms.

Furthermore, the authors have tried to explain the management of AR in their department. AR diagnosis, investigations, and treatment were based on the latest ARIA recommendations.<sup>8</sup> Patients with a high clinical suspicion or confirmed diagnosis of AR via testing were counseled regarding allergen avoidance, prescribed nasal spray therapy, and instructed on the spraying technique.

Allergen avoidance measures were either specific for the identified allergen or general for dust mites and pollens. Asthmatic patients were educated regarding the need for nasal therapy as part of the “one airway one disease” concept. The asthma and AR brochure, from Irish Asthma Society, was provided to all patients.<sup>16</sup>

The medical treatment of this condition and GP follow-up were highly reinforced. Nasal treatment, in the form of saline nasal rinses (Neilmed, NeilMed Pharmaceuticals Inc., Canada) followed by a steroid spray half an hour after the rinse, was started for a minimum of 3 months. Our recommended nasal spraying technique was shown to each patient for full benefit of their medication. This consists of spraying each nostril with the ipsilateral hand, aiming at the lateral corner of the eye. Sniffing the spray was not recommended. A letter was dictated to their GP with the diagnosis and management plan, based on the ARIA guidelines.<sup>8</sup>

Analysis was performed using Minitab 17 (Minitab LLC, Pennsylvania, USA). We have analyzed patient’s demographics, presenting symptoms, initial investigations, and treatment in the community. We have also reviewed our investigations and treatment outcomes when available.

## RESULTS

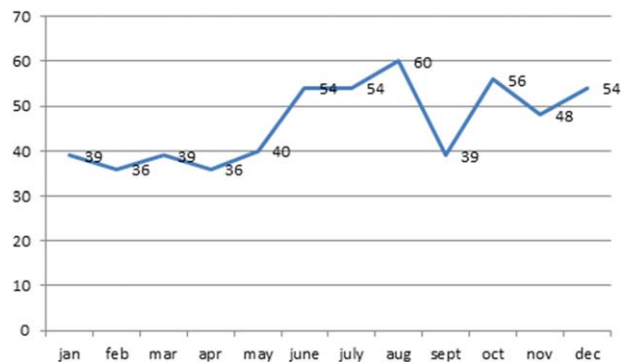
During the last 5 years, 555 newly diagnosed AR patients were seen in our clinic. Three hundred and five patients were males (63%), and 205 were females (37%). Their age ranged from 1 to 19, with a median age of 9 years.

Taking into account their birth month, most of our patients were born in August and October. Details can be followed in Figure 1. Almost half of our tested patients (48.5%) were 5-9 years of age, as shown in Table 1. Forty-six percent of patients were seen in the year 2019. On average, 74 patients were seen in each of the preceding years.

GP represented the main referral source of our patients (90.6%). Few patients (5.7%) were already in our system for associated

### Main Points

- In the community, allergic rhinitis (AR) is under-diagnosed and sub-optimal treated.
- The AR diagnosis was based on allergen-specific testing in half of our cases, while in the other half, it was a clinical diagnosis.
- The main allergens in our region are dust mite and grass pollen, with half of our population sensitized to both allergens.
- We propose an instruction manual for general practitioners, suggesting initial appropriate and consistent topical therapy in keeping with ARIA guidelines. This is aimed to reduce the need for testing and specialist referral.



**Figure 1.** Birth month representation of our patients (in numbers).

otorhinolaryngology (ORL) pathology (mostly otological issues). Our respiratory colleagues referred 12 patients to our clinic.

Upon analyzing the patient's main complaints, nasal congestion followed by typical hay fever symptoms were the most common. The rest of the symptoms can be followed in Table 2. A 96.6% of our patients had symptoms for many years and only 2.7% experiencing their symptoms for few months only. Only 20 GPs (4%) examined their patient's noses before referring them to our clinic. A query polyp, seen in 13 of these examined noses, was their most common finding.

When examined via an anterior rhinoscopy by a specialist in our clinic, 465 (83.7%) noses looked typically allergic, with 65 cases (11.7%) rhinitic and 25 (4.5%) normal looking. Out of the 13 cases of query nasal polyps seen by a GP, only one patient had a unilateral polypoid middle turbinate that responded after topical steroid treatment. The same patient underwent a computer tomography of sinuses, which was entirely normal.

Prior to attending our clinic, 105 patients (19%) were prescribed a steroid nasal spray, mainly as monotherapy. Seventy-six patients used it for a short course (maximum of 2 months), with only 23 cases using it longer. Improved symptoms were reported by over two-thirds of these patients. The spray therapy outcomes can be followed in Table 3.

Most of these patients had their nasal sprays prescribed by the respiratory physicians they see for their asthma management. Only six of our patients (5.7%), previously seen by an otorhinolaryngologist, received instructions on the correct spraying technique.

Fifty-eight patients (10.4%) received oral antihistamine and six (1%) leukotriene inhibitor medications. One-third of these patients found them helpful with their rhinitis symptoms.

**Table 1.** Age Groups Distribution of Our Patients (in Numbers and Percentages)

Age group (years)	Patients No. (%)
0-4	57 (10.3)
5-9	269 (48.5)
10-14	183 (33)
15-19	46 (8.2)

**Table 2.** Presenting Symptoms of Our Study Population (in Numbers and Percentages)

Presenting symptoms	Patients (number)	Patients (%)
Nasal congestion	241	43.4
Hay fever	147	26.4
Epistaxis	62	11
Snoring	50	9
Rhinorrhea	27	4.8
Obstructive sleep apnea	12	2.1
Rhinitis	3	0.5
Rhinosinusitis	2	0.3
Chronic cough	2	0.3
Post nasal drip	2	0.3
Upper respiratory tract infections	2	0.3
Sneezing	1	0.1
Infra orbital swelling	1	0.1
Nasal malodor	1	0.1

A history of atopy was present in 107 patients (19%). One hundred and forty-eight of all our patients (26%) had a diagnosis of asthma. A family history of atopy was documented in 37 cases (6.7%).

A previous diagnosis of AR and a symptom-based AR diagnosis at presentation were possible in over half of our patients (52.5%).

Of the patients who underwent flexible nasal endoscopy in our clinic, an adenoidal pad enlargement was found in 39 patients, but it was obstructive only in seven cases.

Three hundred and thirty-seven patients (60.7%) had an allergen specific test done. Twenty percent of tests were performed before attending our clinic. Details can be followed in Table 4.

We performed 270 allergen tests, for almost half of the patients seen (48.6%). Testing was done almost exclusively via RAST (99%). Eleven patients (2%) had allergen tests repeated over the years. All of them had the same result with the previous test. Thirty percent of patients presenting with epistaxis tested positive for an aeroallergen.

**Table 3.** The Reported Response to Local Therapy Prior to Attending Our Clinic (in Numbers and Percentages)

Initial local therapy response	Patients (number)	Patients (%)
Great benefit	55	52.4
Some benefit	11	10.5
No benefit	16	15.2
Not sure	13	12.4
Noncompliant	10	9.5

**Table 4.** Details of Allergen Testing Patients Prior to Attending Our Clinic

Allergen tests performed pre-ORL assessment	Patients (number)	Patients (%)
All tests	67	20
SASIgET	54	80.6
SPAT	13	19.4
By GPs	14	20.9
By respiratory	16	23.9
Privately	5	7.5
Public allergist/immunology	2	3
Abroad	2	3

Abbreviations: ORL, otorhinolaryngology; SASIgET, serum allergen-specific IgE testing; SPAT, skin prick allergen testing; GP, general practitioner.

We will refer the patient's group who had confirmation of their AR via allergen testing as allergic rhinitis with an identified allergen (ARWIA).

Two hundred and forty-seven patients (44.5%) tested positive for an aeroallergen-specific test. Fifty-five patients had ARWIA prior to attending our clinic, while 200 were confirmed after out testing. AR was found to affect males (175 cases) 2.3 times more often than females (75 cases).

Dust mites followed by grass pollen were by far the most common positive allergens tested in our pediatric population, in both prior and post our clinic assessment, as clearly illustrated in Table 5.

ORL follow-up was offered to 325 (58.5%). The attendance rate to their appointment was 90%. Seventy-seven patients were seen multiple times, mainly for other ORL-related issues, otological complaints at origin.

Improved AR symptoms after our clinic nasal spray trial with instructions were noted by 161 patients in which follow-up was possible. Twenty-six patients were noncompliant with the prescribed topical medication.

Seventy-seven patients were offered surgery for their enlarged adenoids, recurrent tonsillitis, or for obstructive sleep apnea symptoms. Adenoidectomy was the most performed procedure for these patients, with further breakdown shown in Table 6.

**Table 5.** Allergens Tested in the Pre- and Post-ORL Assessment in Percentages

Allergen tested	Pre-ORL assessment (%)	Post-ORL assessment (%)
Dust mite	45.2	44.7
Grass pollen	27.3	29
Dog	12.6	16.3
Cat	10.5	8.8
Aspergillus/molds	4.2	1

Abbreviation: ORL, otorhinolaryngology.

**Table 6.** Detailed Surgical Procedures for Our Patients in Numbers

Surgical procedures	Patients (number)
Adenoidectomy	31
Adenotonsillectomy	14
Tonsillectomy/tonsillotomy	7
Waitlisted for surgery	25
Did not attend surgery	3

Of the 13 patients who attended a follow-up appointment after their surgery, 11 patients found some benefit with regard to their AR symptoms.

Inferior turbinate reduction, via monopolar Abbey needle (20W) (Graze-dean Ltd, Dorset, UK) was performed in 11 cases. These six of patients have reported only a temporary benefit after their surgery.

Forty-two patients (7.6%) have been advised to consult an allergist/immunologist for their allergies. Ten patients have been already seen by an allergist, and all of them had allergen tested performed.

## DISCUSSION

To our knowledge, this is the first study to investigate GP management of AR patients, particularly pediatric patients in an Irish population. Pediatric AR patients with self-reported symptoms were previously investigated in Irish studies but had no clinical or laboratory evidence of their disease.<sup>17</sup> In one of author's previous ARWIA study, the whole population was the target, and a breakdown of the pediatric group was not performed.<sup>18</sup>

Males were 1.7 times more tested and were found to have 2.3 times increased evidence of ARWIA than females in our study. In a west of Ireland study, females were more tested for aeroallergens than men, but males had ARWIA 1.7 times more often.<sup>18</sup> It is not certain if this higher rate is related to a degree of urbanisation or outdoor jobs and activities.

Patient's age varied widely from 1 to 19 years of age. In our department, we do not see patients older than 16 years of age except for patients referred before their 16th birthday. The most common age group was 5-9 years of age corresponding with the theory that a child is being sensitized to allergens for at least two seasons of pollen exposure before developing symptoms.<sup>19</sup> Genetic and environmental factors play a significant role in developing AR at a younger age.<sup>20,21</sup>

Almost half of our patients were assessed in the year 2019 in our clinic. We are uncertain whether this represents a recent increase in AR cases or an increased access to our service. For our department, it represented a big burden on service for a disease that can be managed in the community and does not have a surgical cure.

An association between patients born during the pollen season and AR was not found in our study, although in a west of Ireland population study, this pattern was confirmed for intermittent AR.<sup>18</sup>

The main referral source to our service is represented by the general practice. Only 2.5% of all patients referred by GP had an allergen specific test performed before attending ORL. Respiratory physicians seem to test patients more frequently for allergies, and they also have access to SPAT, a reliable office test. Their interest is directly related to atopic diseases,

with uncontrolled asthma making testing their priority in order to achieve optimal management.

The atopy prevalence in the general population is very high compared to the population seen in the general practice.<sup>6</sup> This difference is multifactorial, with patient- and GP-related considerations that warrant further discussion. A large European study found the under treatment of AR is to be a consequence of patient's preference for nonprescription medications, avoiding visiting a doctor and preferring homeopathic treatment.<sup>22</sup> These findings support the theory that patients seeking medical advice usually have more severe forms of AR, have mixed rhinitis, and are polysensitized.<sup>23</sup> This could explain the higher number of prescriptions they received yearly. More patients are repeatedly attending their GP for therapy adjustments after initial monotherapy treatment.<sup>24</sup>

A deterioration in the quality of life for seasonal AR patients and more for asthma and AR association was found during the pollen season.<sup>15</sup> Not have been adequately informed of their diagnosis nor given allergen avoidance measurements is often the cause of patient's lack of compliance. The necessary length of consistent medical treatment of AR should be reinforced. Patients also fail to attend follow-up appointments and discontinue their medication.<sup>25</sup> Also, they were not explained the spraying technique.<sup>26</sup> Self-medication, phone-refilled prescriptions, and pharmacist advices also play a role in poor treatment compliance.<sup>27</sup>

In general population studies, the patient self-reports their symptoms. There is an overestimation of AR prevalence as they might not be able to differentiate between a runny nose secondary to AR or upper respiratory tract infection.<sup>9</sup> There is also the possibility that GP misclassifies AR as rhinitis or rhinosinusitis.

Nolte et al. found that asthma and AR were undiagnosed and under treated in 50% of SPAT-positive Denmark population.<sup>27</sup> Many GPs are neither able to identify AR symptoms nor familiar with the examination of a normal or allergic nose. In our study, a previous diagnosis of AR and a symptom-based AR diagnosis at presentation were possible in over half of our patients. As per some UK studies, even GPs with an allergic interest showed difficulties in the diagnosis and treatment of AR patients.<sup>14</sup> This might reflect the lack of resources in general practice and poor access to investigations. Also, the lack of time or reluctance to carry out SPAT testing should be considered. As we can see, the under diagnosis of AR in GP practice has many causes. All these data, in conjunction with our data, support the need for patient and GP education.

Our study demonstrates the correlation between the clinical AR suspicions with allergen-specific testing results for half of our patients. Dust mites followed by grass and dog dander are the main sensitizing allergens in our area. This corresponds to results from south and west part of the country.<sup>17,18</sup>

There was a 100% correlation between repeated allergen testing results, even after years apart. As reinforced by previous studies, testing should not be repeated in patients with a known allergy test result, only if a new allergen is suspected.<sup>18</sup>

One-third of the children presenting with epistaxis was found to have ARWIA. This association was previously reported in the literature and should be considered in children.<sup>28</sup>

GPs should ask for AR symptoms in atopic patients. Atopic triad patients seem to be a distinctive group in whom the control of their atopies is more challenging.<sup>13</sup> Allergist review and immunotherapy need to be considered more often in refractory cases. A recent study showed that as

few as 0.01% of Irish pediatric patients received immunotherapy.<sup>29</sup> A large number of patients are suffering from nasal hyperreactivity to non-allergic stimuli (non-AR).<sup>30</sup>

AR is an evolving disease with the environmental and climate changes, which has clearly increased overtime. Local guidelines should be released considering AR is a multifactorial disease and taking into account the regional allergens map with their seasonal variation. These could help the clinician to initiate targeted treatment plans, avoidance measures, and reducing the need for testing and specialist referral.

## CONCLUSION

A more efficient triaging and initial management of rhinitis patients by GP could result in fewer patients needing hospital review in the already overbooked clinics.

GP education needs to be implemented. We propose an instruction manual for GP suggesting initial appropriate and consistent topical therapy for at least 3 months particularly in patients with a positive personal or family history of atopy, in keeping with ARIA guidelines.<sup>8</sup> Also, patients need to be instructed in allergy avoidance and correct nasal spray technique. Those who fail should have allergy testing done or an alternative diagnosis considered.

## Study Limitations

A retrospective study has its own limitations regarding data accuracy and collection process that needs to be taken into consideration. There are multiple biases that cannot be controlled. An inferior level of evidence is provided by the observational studies. Anyway, we consider this study as a great opportunity to review our recent AR database and learn about this pediatric population group. It is a unique study that provides opportunity for further guidelines, instructions, and research.

Symptomatic AR patients with well-controlled symptoms were excluded, although important information could have been added to our study. Their AR management strategies can make the purpose of a separate study in understanding these patients. We consider this population group a keystone in understanding AR and its quality-of-life impact.

In our study, half of our patients had a diagnosis of AR based on allergen identification (ARWIA patients), and in the other half, it was a clinical diagnosis. The latter was based on the high suspicion of AR diagnosis and a positive response to our management measures, even when the allergen specific testing was negative.

Broad research criteria, such as "rhinitis" or "asthma", could have been used to recruit more patients for our study, but we consider that the current number is representative for our department.

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