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Original article

Allergic rhinitis versus Idiopathic rhinitis: Are there differences in the symptomatology and nasal obstruction?

Rhinite allergique versus rhinite idiopathique : existe-t-il des différences dans la symptomatologie et l'obstruction nasale ?

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Abstract

Study objective. – Two large groups of rhinitis have been described: allergic and non-allergic. Up to 50% of patients with non-allergic rhinitis do not have a clear aetiology underlying their symptoms and present so-called idiopathic rhinitis. There is a lack of studies comparing the different types of rhinitis. The aim of this study is to analyse differences in severity, symptoms and degree of nasal obstruction between allergic rhinitis and idiopathic rhinitis.

Patients and methods. – A descriptive and analytical observational study in adult patients diagnosed with persistent allergic rhinitis and idiopathic rhinitis. Data collected included the total severity score on a visual analogue scale, sociodemographic variables, presence of nasal symptoms and their severity, and peak nasal inspiratory flow.

Results. – One hundred and eight (65.06%) patients with allergic rhinitis and 58 (34.94%) with idiopathic rhinitis were recruited. The mean severity score was 6.27 ± 1.85 for idiopathic rhinitis and 6.68 ± 2.23 for allergic rhinitis ($P=0.050$), with a higher percentage of allergic rhinitis patients referring to their disease as “Severe” ($P=0.006$). Allergic rhinitis patients were more likely to present sneezing, itching and anterior rhinorrhoea. A greater degree of nasal obstruction in peak nasal inspiratory flow was noted in asthmatic patients ($P=0.001$).

Conclusion. – Idiopathic rhinitis and allergic rhinitis are two different disease entities, which have different clinical characteristics, as well as different comorbidities. Clinical and demographic differences have been found, emphasizing the importance of distinguishing these two entities since effective specific treatments exist for each situation.

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Keywords: Allergic rhinitis; Idiopathic rhinitis; Non-allergic rhinitis; Nasal obstruction

Résumé

But de l'étude. – Actuellement, il existe deux grands groupes de rhinites : allergique et non allergique. Parmi les rhinites non allergiques, l'étiologie n'est pas retrouvée chez 50 % des patients. Ces rhinites sont qualifiées d'idiopathiques. Le but de cette étude est d'analyser les différences cliniques en matière de sévérité des symptômes et principalement de l'obstruction nasale des patients souffrant de rhinites allergiques en comparaison à ceux qui souffrent de rhinites idiopathiques.

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Matériels et méthodes. – Étude prospective incluant des patients adultes souffrant cliniquement de rhinite allergique persistante versus des patients adultes souffrant de rhinite idiopathique. Les données suivantes ont été collectées : variables sociodémographiques ; présence et sévérité des symptômes nasaux (échelle visuelle analogique) et débit inspiratoire nasal.

Résultats. – Cent-huit patients (65,06 %) avec rhinite allergique et 58 (34,94 %) avec rhinite idiopathique ont été recrutés. La moyenne du score global de sévérité était de $6,27 \pm 1,85$ pour la rhinite idiopathique et de $6,68 \pm 2,23$ pour la rhinite allergique ($p = 0,050$). Le pourcentage de patient considérant leur maladie comme sévère était significativement plus important dans le groupe « rhinite allergique » ($p = 0,006$). Les patients souffrant de rhinite allergique présentaient une probabilité plus élevée de souffrir d'éternuements, de démangeaison et de rhinorrhée. Un plus grand degré d'obstruction nasale dans le flux inspiratoire nasal a été observé chez les patients asthmatiques ($p = 0,001$).

Conclusion. – La rhinite idiopathique et la rhinite allergique sont deux maladies différentes, présentant des caractéristiques cliniques et des comorbidités différentes. Les différences cliniques et démographiques qui ont été retrouvées soulignent l'importance de différencier ces deux entités, étant donné qu'il existe des traitements spécifiques pour chacune d'entre elles.

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Mots clés : Rhinite allergique ; Rhinite idiopathique ; Rhinite non allergique ; Obstruction nasale

1. Introduction

Rhinitis is defined as a symptomatic inflammation of the inner lining of the nose, characterized by nasal obstruction, rhinorrhoea, sneezing, or nasal/ocular itch. Classically, two large groups have been described: allergic rhinitis (AR) and non-allergic rhinitis (NAR). On the one hand, AR is among the most common diseases globally, with a prevalence among European adults ranging from 17% to 28.5% [1], and it usually persists throughout life. On the other hand, NAR involves a heterogeneous group of patients presenting rhinitis without clinical signs of infection and without systemic signs of allergic inflammation (drug-induced rhinitis, rhinitis of the elderly, hormonal rhinitis including pregnancy-induced rhinitis, non-allergic occupational rhinitis, gustatory rhinitis, and idiopathic rhinitis). Currently, epidemiological data is limited, but up to 50% of patients with NAR do not have a clear aetiology underlying their symptoms and are so-called idiopathic rhinitis (IR) patients [2].

While both types of rhinitis have been widely studied separately, very few studies have compared these two entities [3–14]. Such studies have focused on symptoms self-reported by patients, sometimes with diagnoses based on postal surveys, without distinction between the different subtypes of NAR and without objective measurements. For this reason, the aim of this study is to analyse differences in severity, symptoms and degree of nasal obstruction (NO) of AR compared with IR.

2. Methods

2.1. Study design and data collection

A descriptive and analytical observational study in adult patients diagnosed with AR and IR, recruited consecutively from the outpatient departments of the Otorhinolaryngology — Head and Neck Surgery Department of a tertiary hospital. This research involved human participants and was approved by the Hospital Ethics Committee (Code: 2016/106). Informed consent was obtained from all individual participants included in the study.

The selection criteria for volunteer participants were:

- confirmed diagnosis of persistent AR according to the Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines criteria [1] or of IR according to the position paper of the European Academy of Allergy and Clinical Immunology [2], and;
- absence of any important nasoseptal deformities or polyps, as determined by physical examination (anterior rhinoscopy and flexible fibronasoscopy) performed independently by two rhinology experts.

To compare both groups, rhinitis was classified as “Mild” (0–3), “Moderate” (>3–7) or “Severe” (>7–10) based on scores on a total severity visual analogue scale (VAS) (0–10 cm). This VAS has shown excellent correlation with objective measurement in adult patients diagnosed with rhinitis [15]. Sociodemographic data, presence of nasal symptoms and their severity based on a VAS, as well as results of nasal peak inspiratory flow (PNIF) (GM Instruments Ltd., Scotland) [16] were collected.

2.2. Statistical analysis

Analysis was made using the statistical package R 3.4.2 (The R Foundation for Statistical Computing®). Statistical tests were two-tailed with a 95% confidence interval. A descriptive analysis was made of the characteristics of patients and scores on the scales used. Quantitative variables were expressed as mean $\pm$ standard deviation (SD) and median as appropriate. Qualitative variables were expressed as frequency and percentage. For comparison of means between groups, parametric tests (Student's *t* test and Anova) were used for variables meeting the normality hypothesis (Shapiro-Wilk test) and the Levene test was used for comparison of variances. In cases where non-normality was significant, nonparametric methods were used (Wilcoxon test and Kruskal-Wallis test).

3. Results

3.1. Descriptive analysis

A total of 166 Caucasian patients were recruited. Of these, 46 were men (27.71%) and 120 (72.29%) women. The mean age of the group was 37.26 ± 13.68 years: 34.47 ± 12.74 years for men and 38.33 ± 13.92 years for women ($P=0.043$).

The existence of atopic diseases was evaluated, with 36 (21.95%) patients presenting atopic dermatitis and 58 (35.37%) asthma, with no differences regarding gender ($P=0.528$ and $P=1$, respectively). In all 59.76% of the population were non-smokers, with the remaining percentage being divided between smokers (18.29%) and ex-smokers (21.95%). No differences were found regarding gender ($P=0.236$).

By rhinitis type, 108 (65.06%) patients with AR and 58 (34.94%) with IR were recruited. The mean age in patients with AR was 32.90 ± 12.80 years and 45.36 ± 11.46 years in patients with IR ($P<0.000$). In the AR group, 72 (66.6%) were women versus 48 in the IR group (82.8%) ($P=0.027$). Differences in tobacco consumption between groups were not established ($P=0.257$).

Forty-two (39.6%) patients in the AR group versus 16 (27.6%) in the IR group presented asthma ($P=0.129$).

Twenty-two (20.8%) of AR patients and 14 (24.1%) IR patients had atopic dermatitis ($P=0.694$). The rest of the descriptive analysis is given in Table 1.

3.2. Symptoms and severity

Regarding severity of symptoms, the mean VAS score for the study population was 6.5 ± 2.1 , with 17 (10.24%) patients reporting “Mild” severity, 84 (50.60%) “Moderate” and 65 (39.16%) “Severe”. By type of rhinitis, the mean VAS score was 6.27 ± 1.85 for IR versus 6.68 ± 2.23 for AR ($P=0.050$), with a higher percentage of AR patients referring to their disease as “Severe” than in the IR group ($P=0.006$).

Taking into account other factors associated with greater severity, the possible existence of differences in terms of smoking habit was studied, but no differences were found ($P=0.060$). In asthma patients, differences in severity were significant ($P=0.010$), with a higher percentage of non-asthmatic patients presenting mild rhinitis. The rest of the descriptive analysis is given in Table 1.

An individual study of each nasal symptom was performed in both groups and showed a greater probability of sneezing, itch and anterior rhinorrhoea in the AR group, with the latter symptom being more severe than in IR patients ($P=0.002$). Details

Table 1
Descriptive and comparative analysis of the sample concerning severity.

Groups	n (%)			P-value
	Mild	Moderate	Severe	
Total	17 (10.24)	84 (50.6)	65 (39.16)	
Type of rhinitis				
AR	12 (11.1)	45 (41.7)	51 (47.2)	0.006
IR	5 (8.6)	39 (67.2)	14 (24.1)	
Gender				
Male	7 (15.2)	22 (47.8)	17 (37)	0.436
Female	10 (8.3)	62 (51.7)	48 (40)	
Asthma				
No	15 (19.1)	46 (42.6)	45 (38.3)	0.010
Yes	2 (7.1)	38 (67.9)	18 (25)	
Smoking status				
Non-smoker	8 (8.2)	52 (53.1)	38 (38.8)	0.060
Smoker	7 (21.9)	10 (31.2)	15 (46.9)	
Ex-smoker	2 (5.6)	22 (61.1)	12 (33.3)	
IR				
Male	2 (20)	8 (60)	2 (20)	0.579
Female	4 (9.1)	30 (68.2)	10 (22.7)	
Non-asthmatic	0	12 (75)	4 (25)	
Asthmatic	6 (15.7)	24 (63.2)	8 (21.1)	0.276
Non-smoker	4 (15.4)	18 (69.2)	4 (15.4)	
Smoker	2 (16.7)	8 (66.7)	2 (16.7)	
Ex-smoker	0	10 (62.5)	6 (37.5)	
AR				
Male	4 (12.5)	14 (43.8)	14 (43.8)	0.808
Female	12 (18.2)	28 (42.4)	26 (39.4)	
Non-asthmatic	4 (10)	26 (65)	10 (25)	
Asthmatic	12 (21.4)	16 (28.6)	28 (50)	0.006
Non-smoker	6 (10)	28 (46.7)	26 (43.3)	
Smoker	6 (37.5)	2 (12.5)	8 (50)	
Ex-smoker	4 (20)	12 (60)	4 (20)	

AR: allergic rhinitis; IR: idiopathic rhinitis.

Table 2
Analysis of the various symptoms typical of rhinitis.

Types	<i>n</i> (%)	OR	<i>P</i> -value	Global Mean ± SD	<i>P</i> -value	Mild Mean ± SD	Moderate	Severe
<i>Anosmia</i>								
AR	64 (61.5)	0.58	0.136	6.38 ± 2.55	0.246	7.50 ± 2.88	5.53 ± 2.31	6.80 ± 2.60
IR	28 (48.3)			5.76 ± 2.65		8.0	4.5 ± 2.46	6.0 ± 2.21
<i>Obstruction</i>								
AR	94 (90.4)	0.41	0.057	7.22 ± 2.12	0.228	7.50 ± 2.20	6.52 ± 1.75	7.85 ± 2.11
IR	46 (79.3)			6.90 ± 1.84		6.0	6.57	7.83 ± 1.85
<i>Sneezing</i>								
AR	98 (94.2)	0.22	0.006	6.73 ± 2.22	0.121	4.50 ± 3.06	6.40 ± 1.67	7.89 ± 1.46
IR	44 (78.6)			6.14 ± 2.34		6.50 ± 1.73	6.14 ± 2.57	6.00 ± 2.00
<i>Itching</i>								
AR	90 (86.5)	0.41	0.034	6.33 ± 2.41	0.390	6.16 ± 1.94	5.17 ± 2.32	7.37 ± 2.09
IR	42 (72.4)			5.85 ± 2.50		7.66 ± 1.36	5.75 ± 2.17	5.00 ± 3.33
<i>Anterior rhinorrhoea</i>								
AR	86 (82.7)	0.44	0.046	7.47 ± 1.63	0.002	6.2 ± 2.78	7.4 ± 1.03	8.0 ± 1.43
IR	38 (67.9)			6.31 ± 2.02		6.00 ± 1.54	5.75 ± 1.91	7.40 ± 2.17
<i>Posterior rhinorrhoea</i>								
AR	62 (59.6)	1.11	0.867	6.24 ± 2.57	0.734	7.00 ± 3.29	5.27 ± 2.35	7.00 ± 2.2
IR	36 (62.1)			6.05 ± 2.70		8.0 ± 2.30	6.0 ± 2.11	5.5 ± 3.45

OR: odds ratio; SD: standard deviation; AR: allergic rhinitis; IR: idiopathic rhinitis.

of the remaining comparisons between the two types of rhinitis are shown in Table 2.

3.3. Peak nasal inspiratory flow

The mean PNIF was 86.68 ± 35.96 L/min, being 98.69 ± 37.63 L/min for men and 82.08 ± 34.36 L/min for women ($P=0.004$). In the “Mild” group, PNIF was 106.47 ± 32.96 L/min versus 92.02 ± 38.44 L/min in the “Moderate” group and 74.61 ± 29.26 L/min “Severe” group ($P=0.001$).

By type of rhinitis, PNIF in AR patients was 86.48 ± 36.64 L/min versus 87.06 ± 34.98 L/min in IR patients ($P=0.893$). Neither difference in PNIF was found between AR and IR according to the different severity groups (Fig. 1).

Regarding smoking status, PNIF was 88.06 ± 37.92 L/min for non-smokers, 91.11 ± 34.41 L/min for ex-smokers, and 77.5 ± 30.53 L/min for smokers ($P=0.333$). The differences in PNIF for asthmatic versus non-asthmatic patients were statistically significant ($P=0.001$), with greater severity recorded in asthmatic patients. By type of rhinitis, non-asthmatic IR patients had a score of 106.87 ± 35.39 L/min versus 79.52 ± 32.11 L/min for asthmatic IR patients ($P=0.015$). Non-asthmatic AR patients had a score of 97.38 ± 38.49 L/min versus 80.93 ± 33.48 L/min for asthmatic IR patients ($P=0.027$).

4. Discussion

Differentiating between AR and IR can be difficult since allergic and non-allergic conditions can present similar symptoms [17]. Being able to correctly distinguish the different types of rhinitis is essential for selecting appropriate treatment to improve symptoms, quality of life, and work and school performance.

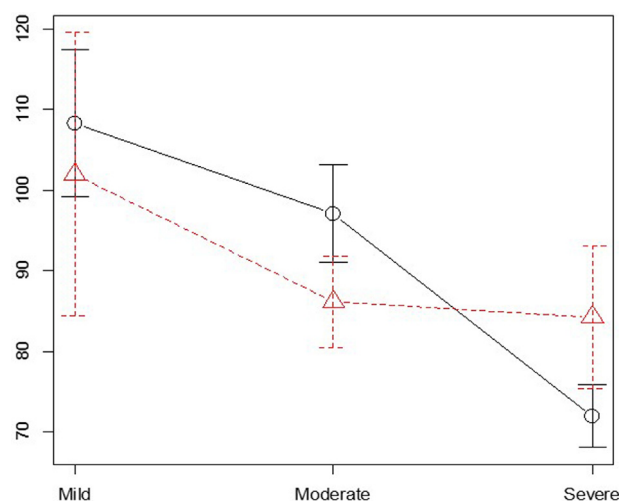


Fig. 1. Correlation of degree of nasal obstruction (L/min) with severity by type of rhinitis (circle: allergic rhinitis; triangle: idiopathic rhinitis).

The studies carried out show significant heterogeneity in the profile of the populations targeted (e.g. representative population sample, patients consulting at a clinic, data collection methods, etc.), as well as in the disease definitions and diagnostic techniques used. Some studies were performed before and others after the ARIA guidelines and used different classifications, rendering comparison difficult. The aim of this study was to analyze the severity, symptoms and degree of NO for AR compared with IR.

For this reason, when analysing the results of this study and comparing them with the previous literature, it is important to point out that the majority of these studies do not distinguish between the different subtypes of NAR. Specifically, there are no comparative studies of symptoms in patients with a differential diagnosis of IR versus AR. The problem with these studies

is that they were carried out by mail or generic survey, with diagnosis based solely on symptoms reported by the patients themselves and without the evaluation of a trained doctor or laboratory tests [9,12–14]. This supposes a high number of losses and the possibility of selection bias caused by the participation mainly of volunteers with severe rhinitis. In addition, the populations of the previous studies were extremely heterogeneous, mixing paediatric patients with adults. The use of such surveys has been studied, and shows that even with a standardized questionnaire, the sensitivity of identification of atopic sensitization to airborne allergens is modest at best. The results of surveys on AR versus NAR relying solely on questionnaires must therefore be considered with caution [18].

The results obtained appear to indicate that AR is more prevalent than IR as a reason for consultation, and cautious extrapolation of this fact is consistent with most previous studies [4,7,8,10,14]. Despite this, there are reports suggesting a similar prevalence [3] and possibly even predominance of NAR [9]. On the other hand, a higher prevalence of IR was found in women, a finding also reported by other authors [7]. It has also been observed that AR is found in younger patients, which is consistent with existing evidence that seems to indicate an increase in the prevalence of this entity among younger people [19].

Comparing the symptoms of each type of rhinitis, there seems to be an increased risk of sneezing, itching or anterior rhinorrhoea in AR patients compared with IR patients, with similar severity of these symptoms in both groups except for the last one. These results are consistent with what has been observed by other authors [4–7]. Despite this concordance, other studies using similar methodologies identified no differences [3,14]. The relationship between AR and asthma has been amply studied [1], and while some authors have reported a higher prevalence in AR patients [4,12], no differences were seen in our population. What seems clear is that patients with AR and asthma have more severe symptoms and a greater degree of NO. The objective study using PNIF revealed no difference in NO between AR and IR. Subjectively however, the tendency is for AR patients to report greater severity, a fact that is contradicted by the previous literature, which refers to greater obstruction and sinus involvement in NAR [7].

Among the limitations of this study, it is important to highlight the impossibility of analysing the prevalence of such diseases, since patients were recruited solely from an outpatient department and the data collected could thus not be extrapolated to the general population. However, our focus was on the rhinitis population and not on epidemiological study of the prevalence of AR and IR. Secondly, subjects presenting only mild and intermittent symptoms may not recognize their condition as treatable, which could influence patient motivation to participate in the study or even to simply attend the consultation or accept being referred from primary care services. This may also apply to subjects presenting symptoms all year around and who may therefore consider their symptoms simply as a fact of life rather than a disease requiring treatment. This group is likely to include individuals with IR or AR, so these may be underrepresented. Third and lastly, there is a lack of homogeneity in previous studies that would enable us to compare our

results, so we have taken as a reference population studies conducted in patients with NAR without differentiating between subtypes.

5. Conclusions

IR and AR are two different disease entities having different clinical characteristics as well as different comorbidities. Clinical and demographic differences have been found, emphasizing the importance of differentiating between these two entities: it is important to correctly identify rhinitis patients since effective specific treatments exist for each condition. This study highlights the lack of literature comparing the two entities using a robust methodology. Future research needs include closer investigation of IR subjects in a larger sample. Further, more attention should be paid to accurately distinguishing between different subtypes of NAR in relation to treatment, mucosal characteristics and anatomical variations, objective measurements, nasal polyps and local production of IgE against common allergens.

Disclosure of interest

The authors declare that they have no competing interest.

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