Sneezing and Runny Nose: Should Allergy Testing Be Routinely Performed?

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Abstract The need for routine determination of rhinitis subtypes by allergy testing and the relevance between symptoms and allergy were evaluated. A retrospective study at a tertiary hospital, ENT clinic. One hundred and twenty-seven adult patients with sneezing and runny nose for at least 6 months for the last two consecutive years were included. The age range was 16–60. Allergy testing was only positive in 43.4% of the patients. Excluding mixed rhinitis, persistent sneezing and runny nose were mostly related to anatomical deformities, mainly septal deviation followed by vasomotor rhinitis. Persistent sneezing and runny nose may be caused by different etiologies other than allergy. Determination of rhinitis subtypes is important for accurate treatment of patients with these symptoms. Taking appropriate medical history and performing a good physical exam with objective allergy testing are highly recommended.

Keywords Allergic rhinitis · Nonallergic rhinitis · Sneezing · Runny nose

Introduction

Allergic rhinitis (AR) is a common manifestation of allergic diseases, which affect approximately 10–25% of the world population [1]. AR is characterized by sneezing, rhinorrhea, nasal discharge, nasal congestion, itchy/watery eyes and headaches. The most bothersome symptoms are sneezing, runny nose, itching and nasal congestion [2–4]. However, chronic rhinitis symptoms do not mean allergy every time. When approaching patients with chronic rhinitis patients, specifically with runny nose and sneezing, the diagnostic challenge is to determine the etiology whether it is allergic or nonallergic or a combination of both rhinitis.

Two main symptoms: sneezing and runny nose with or without itching are expected, especially if they are persistent, as signs of AR and treatment for allergy is directly given for patients with these symptoms without further allergy testing. This approach may cause loss of time, overtreatment with antiallergic drugs and economic burden if the patient actually does not have allergy.

The need for routine determination of rhinitis subtypes by allergy testing and the relevance between symptoms and allergy were evaluated in this study.

Materials and Methods

From September 2008 through September 2009, 200 patients were evaluated at our allergy-rhinitis clinic. The charts of these patients were reviewed. One hundred and twenty-seven patients with persistent sneezing and runny nose for at least 6 months for the last two consecutive years and who had not evaluated by allergy testing previously were included in this study. Patients younger than 16 and older than 60 were excluded (mean age $\pm$ standard error = 35.45 ± 1.109).

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Patients younger than 16 were evaluated by pediatric allergy specialist. That's why they were excluded. Patients older than 60 were excluded due to poor skin response to allergy testing. The percentage of female and male patients was 68.5 and 31.5% respectively. All these cases were considered as having allergic rhinitis and referred for allergy evaluation and testing by other otolaryngologists. They had anti allergy treatment many times before. Detailed history including medicines taken, emotional condition, systemic disease and hormonal status was obtained. Detailed ENT exam, endoscopy, CT, acoustic rhinometry, nasal smears and allergy testing either skin prick or in vitro testing were performed.

The main symptoms were runny nose, sneezing and in some cases mild-moderate nasal congestion. The rhinorrhea was typically watery and clear. Family history (usually clinically diagnosed) was positive for most of them. All patients showed pale, edematous and buggy turbinates which were usually considered more characteristic for allergic rhinitis although not diagnostic. Turbinates, nasal septum, nasal passages and nasopharynx were examined for hypertrophy, deviation, perforation, foreign bodies, masses, secretions etc. CT was used to exclude chronic sinus infections, tumors and structural pathologies. Acoustic rhinometry showed either reversible congestion as in allergy, vasomotor cases or structural pathologies as in septal deviation, turbinate hypertrophies. Eleven of patients were tested by ELISA due to contraindication to the skin testing. Contraindications to skin testing were beta blocker use, cardiac disease, hypertension and severe systemic disease. Six patients were specific IgE positive for grass allergens (three showed class 3 and 3 showed class 2), 4 patients showed mite positivity (two class 2, one class 3 and one class 4) and one patient showed no positivity. Total IgE was also checked for these patients, which showed mixed results (some have high total IgE and some have normal levels). Prick testing was performed by quanti test apparatus (Alerkan Medical Firm, Ankara) and allergens were purchased from Star allergens (Say Medical Firm imported the allergens). Our skin prick test battery included the positive and negative controls, *Dermatophagoides pteronysinus*, *D. farinae*, storage mites, cat epithelia, dog epithelia, feathers mixture, betulaceae, fagaceae, oleaceae, salicaceae, tree polens mixture, 5 grass mix, chenopodiaceae, compositae, cockroach, latex, aspergillus mix, helminthosporium, alternaria, mucor racemous, rhizopus nigricans, stemphylium botryosum, alfalfa and salsola kali (Stallargenes, Say Medical Firm). Wheals greater than 3 mm from negative control were accepted as positive results.

Results

Allergy testing was only positive in 43.4% of the patients. Almost 14% of the patients had pure AR while 29.2% of them

Table 1 Detailed analysis of rhinitis patients

Diagnoses	Frequency	Percent	Valid percent	Cumulative percent
1	32	25.2	25.2	25.2
1, 3, 7	1	0.8	0.8	26.0
1, 4, 8	1	0.8	0.8	26.8
1, 5	4	3.1	3.1	29.9
1, 5, 7	3	2.4	2.4	32.3
1, 7	32	25.2	25.2	57.5
2	25	19.7	19.7	77.2
3	3	2.4	2.4	79.5
4	1	0.8	0.8	80.3
4, 5	1	0.8	0.8	81.1
5	5	3.9	3.9	85.0
6, 7	1	0.8	0.8	85.8
7	18	14.2	14.2	100.0
Total	127	100.0	100.0	

In diagnoses column, the numbers demonstrate: 1 Septum deviation, 2 Vasomotor rhinitis, 3 Sinusitis, 4 Sinechia, 5 Nasal polyp, 6 Septal perforation, 7 Allergic rhinitis, 8 Alar valve collaps

had mixed rhinitis. More than half of the patients actually did not have AR though they were under allergy treatment.

In 25.2% of patients, nasal septal deviation and AR were jointly diagnosed diseases. Pure septal deviation (25.2%) was the most common diagnosed disease followed by vasomotor rhinitis (19.7%) and pure AR (14.2%) excluding mixed rhinitis as the cause of persistent sneezing and runny nose in this study. Thirteen of the patients (10.2%) had nasal polyp formation. Three patients (2.3%) had both nasal polyps and AR simultaneously. The detailed documentation of patients was presented in Table 1. The diagnoses were numbered for statistical analysis.

The mean age of AR positive group ($n = 53$) was 35.06 ± 1.65 (mean $\pm$ standard error) while this value for AR negative group ($n = 74$) was 35.73 ± 1.501 (minimum 16, maximum 60). The percentage of allergy in female patients was 41.4 whereas the ratio was 42.4% in male patients.

Geriatric rhinitis was excluded by the age of the patients. All patients were younger than 60. Thyroid hormone levels were checked in suspicious patients, which were negative. Interestingly, none of the nasal smears showed eosinophilia. That's why nonallergic rhinitis with eosinophilia syndrome (NARES) was not presented in the table.

Discussion

In this study, the need for routine determination of rhinitis subtypes by allergy testing and the relevance between symptoms and allergy were discussed.

Chronic rhinitis symptoms are among the most common problems presenting to physicians. When approaching this problem, the diagnostic challenge is to determine the etiology, specifically whether it is allergic, nonallergic, or perhaps a combination of both conditions. Estimates of the prevalence of allergic rhinitis range from as low as 9% to as high as 42%, which was 43% in current study [5]. Chronic rhinitis symptoms of sneezing and runny nose with or without itching may be related to allergic or non allergic etiological factors such as chronic rhinosinusitis, vasomotor rhinitis, NARES and anatomical deformities. Anatomical deformities may be considered under nonallergic rhinitis title or apart from “nonallergic rhinitis” title but still a subtype of rhinitis. It is still a debate whether clinicians should routinely perform allergy testing to differentiate subtypes of rhinitis or not.

It is believed that patients with AR often have prominent sneezing, runny nose and they may have a very itchy nose and itchy eyes, which is not frequently seen in nonallergic rhinitis [6–11]. However, this study did not support this idea. Although the main symptoms of patients were runny nose and sneezing with mostly itchy nose, pure AR was only the 3rd leading cause of rhinitis in 14.2% of the patients. Most importantly, nasal septal deviation was the first leading cause with the percentage of 25.2 followed by vasomotor rhinitis of 19.7%.

In contrast to current study, Bauchau et al. conducted a two-step study: a total of 9646 telephone interviews were conducted at first step. Self awareness of AR was reported by 19% of the subjects. Physician based diagnosis of AR was reported by 13% of the subjects. In step 2, 725 clinical assessments were conducted (they were evaluated with a questionnaire and specific IgE measurements). A total of 411 patients, who underwent step 2, had investigated confirmed allergic rhinitis. Among patients with investigator confirmed AR, 45% had not reported a previous diagnosis by a physician. They stated that AR was frequently under diagnosed [12]. However, current study demonstrated that AR was usually over diagnosed and patients were usually over treated for allergy like nasal symptoms if they were not allergy tested for confirmation.

We, the authors of this article, argue that one of the reasons why rhinitis subtypes does matter is that, in most of the cases, classification of the patient as allergic or non allergic is going to affect the treatment regimen. Current study demonstrated that this classification could not be made by depending only history of allergy symptoms. Almost 60% of patients were factitiously diagnosed as having allergy by only considering symptoms. Although to some clinicians, standard treatment for allergic or non allergic rhinitis is often the same, certain subtypes of the disease do not respond well to the usual first line treatments

for AR. Identification of subtype, therefore, can potentially have important implications for treatment choice.

Routine use of an oral antihistamine or a leukotriene blocker for patients of nonallergic rhinitis is not recommended. Usually treatment regimen containing antihistamine does not control patient's symptoms effectively. Topical antihistamine or topical corticosteroids could be used for vasomotor rhinitis as in AR. However, only 33.9% (pure AR and vasomotor rhinitis) of the patients were in that category in current study. Moreover there are more rhinitis etiologies other than vasomotor rhinitis, and they need to be assessed up front. One should try to identify these other types of rhinitis since there are different recommended treatments for them as in anatomical deformities, hormonal rhinitis, medicine based rhinitis. While surgical interventions should be considered for anatomic deformities, which were the major rhinitis subtypes in current study, neither antihistamine nor topical corticosteroids would be effective for hormonal rhinitis or medicine based rhinitis. Another important point is that a large percentage of allergic patients under treatment may still have disturbing symptoms and they may need special control measures and immunotherapy, which requires allergy testing.

25.2% of patients had mixed rhinitis, having both septal deviation and AR. Patients with mixed rhinitis should be treated for both diseases. If these patients were treated for only AR symptoms, they would still have symptoms caused by anatomical deformity.

Key Messages

Determination of rhinitis subtypes is important for accurate diagnosis and treatment. Although objective allergy testing in pure AR and mixed rhinitis is useful, but needs to be recommended judiciously and not as a protocol in all cases. Taking appropriate medical history and performing a good physical exam with objective allergy testing for patients with persistent runny nose and sneezing are highly recommended.

Conflict of interest No competing interest.

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