

Questionnaire evaluation and risk factor identification for nonallergic vasomotor rhinitis

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Background: Chronic rhinitis, a prevalent primary care disorder associated with significant comorbidities, is often incorrectly diagnosed. As a result, inappropriate treatment leads to higher health care costs and poor clinical outcomes.

Objective: To verify whether responses to specific questions may help in the diagnosis of nonallergic vasomotor rhinitis (NAVMR).

Methods: A questionnaire listing allergic and nonallergic triggers was blindly distributed to 100 random new patients with chronic rhinitis in an allergist's office. Questionnaire and physician diagnoses were compared. Allergic triggers included cat, dog, feathers, other furry animals, and symptoms during the spring, summer, and fall seasons. Nonallergic triggers included temperature changes, diesel and car exhaust, tobacco smoke, perfumes and fragrances, incense, cleaning products, newsprint, hairspray, and alcoholic beverages, spicy foods, or eating.

Results: The construct validity and internal consistency indicated that the questionnaire was a good tool for diagnosing NAVMR. Multivariate analysis revealed that the absence of outdoor symptoms in the spring (odds ratio [OR], 7.76; 95% confidence interval [CI], 1.18–51.22; $P = .03$), no parental history of allergy (OR, 5.16; 95% CI, 1.05–25.20; $P = .04$), no symptoms around cats (OR, 3.82; 95% CI, 0.59–24.83; $P = .16$), the presence of symptoms around perfumes and fragrances (OR, 4.875; 95% CI, 1.05–22.60; $P = .04$), and age at symptom onset (OR, 1.08; 95% CI, 1.02–1.14; $P = .008$) were predictive of NAVMR.

Conclusions: Specific questionnaire responses may help primary care physicians accurately diagnose NAVMR. Questions asked of patients by physicians to diagnose allergic rhinitis do not correlate well with physician diagnosis.

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INTRODUCTION

Chronic rhinitis is an inflammatory disease involving the nasal mucosa and is characterized by the symptoms of sneezing, itching, rhinorrhea, postnasal discharge, and congestion. Chronic rhinitis is typically classified as allergic rhinitis (AR) if symptoms and triggers correlate with a specific IgE-mediated response, as nonallergic vasomotor rhinitis (NAVMR) if symptoms are induced by irritant triggers in the absence of specific IgE-mediated responses, and as mixed rhinitis if specific IgE-mediated responses are present in conjunction with symptoms induced by allergic and nonallergic triggers.

Chronic rhinitis is a prevalent primary care disorder associated with significant comorbidities, such as sinusitis, otitis media, and asthma, that affects work and school performance. The prevalence of AR has been estimated to be 5% to 22% in the United States, and its economic impact is estimated to cost the health care system \$2.5 billion annually.^{1,2} Although the prevalence and epidemiologic features of AR are well defined, only a few studies have investigated the frequency of nonallergic rhinitis (NAR). In a 1998 study, the Joint Task Force on Practice Parameters in Allergy, Asthma, and Immu-

nology estimated that 43% of patients with chronic rhinitis have AR, 34% have mixed rhinitis, and 23% have NAVMR.³ Other studies^{4–8} found the prevalence of NAR to be 17% to 52%. However, these studies did not differentiate between noninflammatory VMR (absence of nasal eosinophils) and inflammatory NAR with eosinophilia.

Establishing an accurate differential diagnosis of chronic rhinitis is challenging because symptoms are not always useful in differentiating patients with AR, mixed rhinitis, and NAVMR. A detailed patient and family history and physical examination, in conjunction with skin prick or serum specific IgE testing, are necessary for a proper diagnosis. Primary care physicians tend to be biased toward the diagnosis of AR because they are more familiar with the disorder.⁹ Therefore, treatment is often limited to prescribing second-generation nonsedating antihistamines or nasal corticosteroids, which often do not adequately control symptoms in patients with VMR or NAVMR, thereby resulting in an increased risk of comorbidities such as sinusitis and otitis media.⁹ Ryden and coworkers¹⁰ investigated disease perception and social behavior in patients with chronic rhinitis and reported that prescribed medications were effective in reducing symptoms only 50% of the time, and patients with NAVMR more frequently indicated that medications based on treating underlying allergy had little or no effect on controlling their symptoms. Demoly et al¹¹ reported that only 55% of patients with chronic rhinitis followed their physician's medical advice and that 44% chose to self-medicate their symptoms.

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The current practice for treatment of chronic rhinitis is inefficient and often leaves patients frustrated and in considerable discomfort. Furthermore, ineffective treatment of chronic rhinitis has resulted in higher health care costs and lost productivity, resulting in a greater economic burden on our health care system. The purpose of this study was to test whether specific questionnaire responses could reliably distinguish between AR and NAR.

MATERIALS AND METHODS

Participants and Study Design

A self-administered questionnaire listing symptoms and common allergic and nonallergic triggers was blindly distributed to 100 randomly selected new patients presenting to an allergist's (J.A.B.) office with chronic rhinitis symptoms between March 8, 2003, and May 20, 2004 (Appendix 1). Patients were asked to check any trigger that aggravated their symptoms. Triggers included cat and cat hair; dog and dog hair; feathers; other furry pets; symptoms occurring outdoors during the spring, summer, or fall seasons; temperature changes; diesel and car exhaust fumes; tobacco smoke; perfumes and fragrances; incense; household cleaning products; newsprint; hairspray; and alcoholic beverages, spicy foods, or eating. A physician diagnosis was obtained by either 1 of 3 allergists or a nurse practitioner based on findings from a physician-administered history, physical examination, nasal smear for eosinophils, skin prick testing, or serum specific IgE testing. Specific IgE tests had to correlate with clinical symptoms to establish a diagnosis of AR. A diagnosis of NAVMR was confirmed by history; where irritant triggers aggravated symptoms, skin or serologic test results and nasal eosinophilia were negative.

Statistical Analysis

The items selected for the questionnaire were taken from the recommendations of Kaliner,¹² and the exact wording and phrasing were tested in a pilot study with a sample of 20

individuals. Questionnaire responses and physician diagnoses regarding mixed rhinitis were not included to eliminate the confounding effect of overlapping diseases. The modified questionnaire was tested for construct validity using factor analysis and for internal consistency using the Cronbach α . Factor analysis is a psychometric technique that consists of selecting items that are highly intracorrelated and reliable for measuring a common feature of rhinitis (factor). Logistic regression analysis was performed to identify the best questions that predict the correct disease diagnosis. Finally, we determined sensitivity and specificity to verify the efficacy of the proposed model. The entire analysis was performed using a statistical software program (SAS version 8, SAS Institute Inc, Cary, NC).

RESULTS

Demographic Characteristics

Of the 100 patients enrolled in the study, complete data sets were obtained for 92, of which 54% were female (mean $\pm$ SD age, 30 ± 15.0 years) and 46% were male (mean $\pm$ SD age, 32 ± 16.1 years). Forty percent of the study patients experienced symptoms from nonallergic triggers. These results are consistent with what has been reported in previous studies.⁴⁻⁸ Women were more likely than men to have a diagnosis of NAVMR (67%) or mixed rhinitis (61%).

Construct Validity of the Questionnaire

Factor analysis was performed on 18 triggers listed in the questionnaire (Table 1). Principal component analysis and varimax rotation was used for factor extraction. Seven factors were obtained with an eigenvalue greater than 1, and only factors loading greater than 0.4 were reported (Table 1). The retained factors accounted for approximately 75% of the variance, which means that the 7 factors that were retained helped explain approximately 75% of the physician diagnoses. The items loading on the first 2 factors confirmed that chemical triggers were strongly intercorrelated (factor 1) and

Table 1. Factor Analysis of the Questionnaire

Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Items and Loading Factors*						
Tobacco smoke 0.82	Cat 0.87	Incense 0.47	Spring outdoors 0.81	Fall outdoors 0.84)	Weather changes 0.70	Alcohol 0.89
Perfumes/Fragrances 0.77	Dog 0.82	Spicy food 0.90	Summer outdoors 0.54	Newsprint 0.60	Diesel 0.60	
Incense 0.63	Feathers 0.46	Meal 0.87	Feathers 0.50		Cleaning solvents 0.53	
Cleaning solvents 0.61	Other furry animals 0.88					
Hairspray 0.77						
Variance of each factor, %†						
20	15	13	7.5	7	6	6

* Loading factors greater than 0.4 are considered statistically significant.

† The variance refers to the ability of each factor to help diagnose the true disease state.

measured different disease characteristics than animal triggers, which were also strongly intercorrelated (factor 2). Factors 4 and 5 measured a seasonal component but were also correlated with nonseasonal triggers such as feathers and newsprint. This likely reflects the high incidence of mixed rhinitis in the general population.⁹ Factor 6 demonstrated a strong intercorrelation between triggers typically known to cause NAVMR, which included environmental changes (temperature or barometric pressure).

Factor 3 demonstrated a strong intercorrelation between food triggers and incense, which are less frequently reported nonallergic triggers and likely represent specific forms of NAR, such as gustatory rhinitis. Factor 7 (alcohol) is considered a nonallergic trigger but was not correlated with other independent variables; therefore, it was not possible to draw any conclusions regarding this factor.

When choosing the number of loading factors to be retained among the original 18 triggers, we used the eigenvalue criteria and the “proportion of total variance,” which are commonly used methods for selecting factors for factor analysis.¹³ The 7 retained factors fulfilled the criteria for both of these methods. The eigenvalue “scree” plot demonstrates that the first 4 factors are the most important (Fig 1).

These results indicated that it was possible to group specific triggers for the diagnosis of chronic NAR and AR. From this analysis, it was also determined that questions about nonallergic triggers were the most helpful in establishing the final physician diagnosis. Triggers such as dust, mold, freshly mowed grass, fall symptoms, and starting the furnace were not specific enough to be useful as diagnostic criteria for AR or NAR.

Internal Consistency of the Questionnaire

Internal consistency of a questionnaire is usually measured using the Cronbach α , which describes the precision by which a set of test items measures a single underlying factor.¹⁴ If the test items all measure the same factor, they are

considered to be highly correlated with one another, and the Cronbach α will be greater than .7.¹⁵ A high Cronbach α was observed for questionnaire items characteristic of NAVMR (smoke, perfumes, incense, cleaning products, hairspray, newsprint, diesel, and changes in weather) ($\alpha = .78$), whereas a lower value was observed for questionnaire items characteristic of AR (cat, dog, feathers, other furry animals, and spring, summer, and fall) ($\alpha = .68$). However, a higher Cronbach α was observed when only animal triggers were considered ($\alpha = .79$). Therefore, in this analysis, the set of questions proposed to identify patients with NAVMR based on physician diagnosis seemed to be a good indicator of NAVMR, but the set of questions proposed to identify AR was reliable only for animal triggers and not for seasonal triggers. As previously mentioned, triggers that were not specific to AR or NAVMR, such as dust, mold, freshly mowed grass, and starting the furnace, were excluded from this analysis.

Risk Factor Identification for NAR

Proposed models for AR and NAVMR were developed. However, because the proposed model for AR was not predictive of a physician diagnosis of AR, only the proposed model for NAVMR was pursued. Furthermore, symptoms were not found to be useful in differentiating between AR and NAVMR in our analyses. Although seasonal triggers are historically reported to be good indicators of AR, the results of our questionnaire analysis seemed to be inconclusive. The most obvious reason for this finding is that patients with an AR diagnosis were a more heterogeneous group. Fifteen percent of the patients were diagnosed as having perennial AR (PAR), 27% as having PAR and seasonal AR (SAR), and 14% as having SAR. In this study, it was decided to treat all patients with AR as a single group because when responses for each specific diagnosis were examined, no significant differences in answers regarding seasonal triggers were identified. Regardless of their specific diagnosis, the percentage of patients experiencing symptoms in the spring was very high (93% for patients diagnosed as having PAR, 89% for PAR/SAR, 92% for SAR, and 67% for NAVMR). The high response rate for patients diagnosed as having VMR may be explained by the confounder effect of weather changes (designated as a nonallergic trigger) that coincide with spring and fall. In addition, it seems to be difficult for patients with PAR to differentiate between indoor and outdoor symptoms and for patients to differentiate between seasonal allergy symptoms and seasonal changes in weather.

Bivariate analysis using Pearson correlation coefficients examined the relationship between the various elements of the questionnaire and physician diagnosis. The diagnosis of NAVMR was positively correlated with age ($R = 0.31$; $P = .007$), age at first symptom onset ($R = 0.39$; $P < .001$), exposure to perfumes and fragrances ($R = 0.26$; $P = .03$), and incense ($R = 0.23$; $P = .05$) (Table 2). The diagnosis of NAVMR was negatively correlated with parental history of allergy ($R = -0.30$; $P = .01$), symptoms occurring outdoors

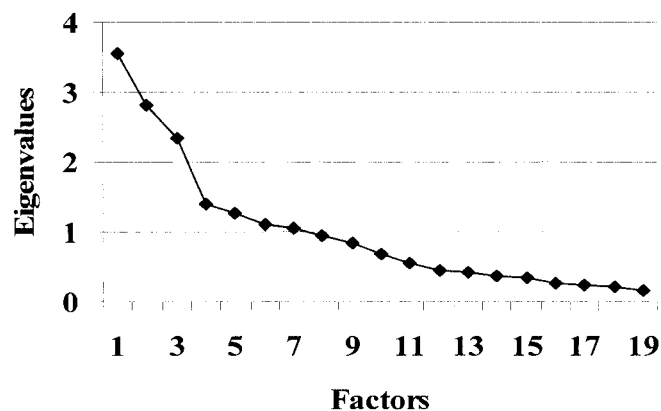


Figure 1. Eigenvalue “scree” plot depicting the significance of loading factors. The eigenvalue represents the amount of variance accounted for by a factor. Factors with eigenvalues greater than 1 were retained. The most important factors are those before the curve begins to plateau (factors 1–4).

Table 2. Pearson Coefficients Correlating the Physicians' Diagnosis of NAR With Questionnaire Responses

Independent variable	R value*	P value
Sex	0.16	.18
Current age	0.31	.007
Age at symptom onset	0.39	.0008
Parental history of allergy	−0.30	.01
Spring outdoor symptoms	−0.29	.01
Summer outdoor symptoms	−0.09	.46
Fall outdoor symptoms	−0.06	.64
Cat and cat hair	−0.27	.02
Dog and dog hair	−0.22	.06
Feathers	−0.17	.16
Other furry animals	−0.27	.02
Perfumes and fragrances	0.26	.03
Hairspray	0.20	.08
Incense	0.23	.05
Newsprint	−0.06	.64
Diesel	0.18	.14
Cleaning products	0.12	.29
Tobacco smoke	0.04	.74
Alcohol	0.04	.73
Meals	−0.03	.80
Spicy foods	0.06	.61
Temperature changes	−0.02	.85

Abbreviation: NAR, nonallergic rhinitis.

* Negative values indicate no symptoms in response to trigger, and positive values indicate symptoms in response to trigger.

during the spring ($R = -0.29$; $P = .01$), and exposure to cat and cat hair ($R = -0.27$; $P = .02$) and other furry animals ($R = -0.27$; $P = .02$).

Multivariate analysis using logistic regression evaluated the predictive ability of all the questionnaire data for establishing a diagnosis of NAVMR (Table 3).¹⁶ In our model, we included all variables that significantly correlated with the diagnosis of NAVMR except for “symptoms around other furry animals” because no patient diagnosed as having NAVMR responded positively to this trigger, making it impossible to obtain maximum likelihood of occurrence. The variables “symptoms with dog and dog hair” and “age” also were not used because there was a high correlation with symptoms involving cat and cat hair ($R = 0.59$; $P < .001$) and age at incidence ($R = 0.63$; $P < .001$). The strongest indicators for NAVMR were the absence of symptoms occurring outdoors during the spring season (OR, 7.76; 95% CI, 1.18–51.22; $P = .03$), no parental history of allergy (OR, 5.16; 95% CI, 1.05–25.20; $P = .04$), and symptoms around perfumes and fragrances (OR, 4.875; 95% CI, 1.05–22.60; $P = .04$).

In this population, the incidence of NAVMR was found to increase with age (OR, 1.08; 95% CI, 1.02–1.14; $P = .008$). When patients were categorized according to age, it was observed that individuals who manifested symptoms after age 35 years had a high likelihood of being diagnosed as having NAVMR. Exposure to cat and cat hairs (OR, 3.82 95% CI,

Table 3. Maximum Likelihood Estimate: Proposed Model to Determine Whether Groupings of Independent Variables Are Predictive Risk Factors for NAVMR

Independent variable	Odds ratio (95% CI)	P value
No parental history of allergy	5.16 (1.05–25.20)	.04
Age of symptom onset	1.08 (1.02–1.14)	.008
No symptoms outdoors during spring	7.76 (1.18–51.22)	.03
No symptoms with cat and cat hair*	3.82 (0.59–24.83)	.16
Symptoms with perfumes and fragrances	4.875 (1.05–22.60)	.04
Wald test†		.009
Goodness-of-fit test‡		.3

Abbreviations: CI, confidence interval; NAVMR, nonallergic vasomotor rhinitis.

* Cat and cat hair were kept in the proposed model because they are a more commonly reported trigger among patients with allergic rhinitis and because the Pearson correlation coefficient was statistically negatively correlated with NAVMR.

† The Wald test null hypothesis assumes that there is no relationship between the independent variables and NAVMR. $P < .01$ disproves the null hypothesis, indicating a relationship between these independent variables and NAVMR.

‡ The Hosmer and Lemeshow goodness-of-fit test compares data from the proposed questionnaire model with data collected from the original questionnaire and assumes that there is a good fit (Appendix 1). $P > .05$ indicates that the original questionnaire data fit the proposed model.¹⁶

0.59–24.83; $P = .16$) was kept in the proposed model because this complaint is commonly reported by allergic patients to cause symptoms. When this variable was removed, the robustness of the proposed model was negligibly affected.

Using data derived from the logistic regression analysis, the likelihood probability of diagnosing NAVMR was calculated to be 96% in a patient with new-onset symptoms at the age of 35 years who reported no parental history of allergy, the absence of symptoms outdoors during the spring, the absence of symptoms around cats, and increased symptoms around perfumes and fragrances. For a similar 45-year-old patient, the probability of having NAVMR was 98%. Analysis of the association between predicted probabilities (questionnaire responses) and observed responses (physician diagnoses) for NAVMR revealed 87% concordance and 13% discordance.

Sensitivity and Specificity

The quality of a questionnaire depends on its ability to select patients who actually have the disease and can be measured by sensitivity (patients who respond positively and have the disease) and specificity (patients who respond negatively and have no disease). The NAVMR global prevalence is unknown but ranges from 17% to 52% in the literature.^{4–8} Assuming the true prevalence to be midrange around 30%, our proposed model provided a sensitivity of 75%, a specificity of 89%, a false-positive rate of 33%, and a false-negative rate of 8% (Table 4).

Table 4. Sensitivity and Specificity of the Questionnaire

Probability level	Sensitivity, %	Specificity, %	False positive, %	False negative, %
0	100	0	76.8	NA
0.1	87.5	47.2	66.7	7.4
0.2	75	77.4	50	8.9
0.3*	75	88.7	33.3	7.8
0.4	62.5	92.5	28.6	10.9
0.5	50	92.5	33.3	14
0.6	31.3	92.5	44.4	18.3
0.7	31.3	94.3	37.5	18
0.8	25	96.2	33.3	19
0.9	6.3	98.1	50	22.4
1	0	100	NA	23.2

Abbreviation: NA, not applicable.

* Assumes that the prevalence of nonallergic vasomotor rhinitis is 30% based on the existing literature.⁴⁻⁸

DISCUSSION

The upper airway has many important functions, including humidity control, filtration of allergens and irritants, and detection of potentially harmful noxious indoor and outdoor air pollutants.¹⁷ The accurate diagnosis of AR requires a careful medical history and physical examination, with confirmatory skin prick or serum specific IgE testing. Odorant or irritant chemical triggers typically aggravate common conditions such as NAVMR. However, the primary care physician, who is usually the first to encounter the patient with chronic rhinitis, is often uncertain on how to differentiate between allergic and nonallergic forms of this disease. Wang and coworkers¹⁸ found that 71% of patients with chronic rhinitis visited a primary care physician for their symptoms. Demoly et al¹¹ reported that patients often wait approximately 2.5 weeks after the onset of symptoms before consulting a physician. Once seen by a primary care physician, diagnosis is usually based solely on clinical symptoms and family history. In the same study,¹¹ they found that only 11% of primary care physicians ordered laboratory tests for patients presenting with chronic rhinitis symptoms, and only 10.3% of these patients were subsequently referred to an allergy specialist.

It is important to accurately diagnose AR and NAVMR because the treatments differ considerably. In the present study, we tested whether a questionnaire designed to elicit information regarding symptoms and triggers from patients with chronic rhinitis would be predictive of a physician diagnosis of AR or NAVMR. Our results demonstrated that certain questionnaire responses were highly predictive of NAVMR but less helpful in the diagnosis of AR.

These findings illustrate the many inherent limitations of depending solely on a medical history for the diagnosis AR. The history provided by patients with chronic rhinitis can be confusing and misleading, especially when one considers that many patients with chronic rhinitis have mixed disease triggered by allergic and nonallergic environmental determinants. Therefore, the need to establish a specific diagnosis of

chronic rhinitis using confirmatory skin prick or serum specific IgE testing is essential. Another limitation is that questions that patients are usually asked to support a diagnosis of AR are often nonspecific. For example, symptoms during the spring, summer, or fall are commonly confused with temperature and barometric pressure changes. Similarly, symptoms around dust may indicate dust mite sensitization or may represent a nonallergic irritation of the nasal passages. One exception confirmed in the present study was cat-, dog- or other furry animal-induced symptoms, which strongly correlated with a physician diagnosis of AR.

The most reliable questionnaire responses for predicting disease were triggers associated with NAVMR. Patients whose symptoms began at the age of 45 years, without a parental history of allergies, the occurrence of symptoms in the presence of perfumes and fragrances, and in the absence of cats and cat hair or being outdoors during the spring had a 98% probability of having NAVMR. This finding has several important implications. First, having a questionnaire that is highly predictive of NAVMR can assist primary care physicians in selecting the appropriate treatment for patients with chronic rhinitis. Second, nonsedating antihistamines are commonly prescribed to patients with NAVMR incorrectly, leading to unnecessary health care expenditures. If clinicians could better classify their patients as having NAVMR or AR, they would be better equipped to select disease-specific medications that will lead to better clinical outcomes. Last, this approach should also facilitate an increased number of, and earlier, referrals by primary care physicians to allergy specialists to characterize whether the patient has an allergic component to their illness.

Generally, patients with NAVMR report experiencing symptoms from a variety of irritant triggers. In the present study, perfumes and fragrances best correlated with a physician diagnosis of NAVMR; however, incense and hairspray approached statistical significance. Other commonly asked triggers, such as tobacco smoke, diesel exhaust, and cleaning solutions, were not predictive of NAVMR. The lack of predictive value of these triggers could reflect the size of our study population or that patients with mixed rhinitis also report irritant triggers. In this analysis, mixed rhinitis was excluded to eliminate the potential for overlapping confounding factors.

Future questionnaire studies using the previously identified predictive characteristics of NAVMR should be conducted in the primary care setting with a larger patient population to determine whether this instrument is useful for improving the diagnosis and treatment of NAVMR. An extension of this study would be to test the interreliability of several physicians diagnosing a single patient with NAVMR. Questionnaires that more accurately correlate with physician diagnosis of AR are still needed but, in our experience, may prove more challenging to accomplish for reasons cited earlier. However, it is possible that a similar study specifically designed to focus on the SAR phenotype could also identify predictive risk factors for this form of rhinitis.

In summary, chronic rhinitis is a prevalent disease that is often inaccurately diagnosed, leading to inadequate management and unnecessary health care expenditures. The availability of a well-designed short questionnaire that correlates with physician diagnosis of NAVMR may serve to modify the current approach taken by primary care physicians for evaluating and treating this disorder. The difficulty in reliably diagnosing AR and mixed rhinitis emphasizes the importance for primary care physicians to work more closely with allergy specialists to characterize their patient's atopic status early on, thereby preventing inappropriate treatment and unnecessary comorbidities.

Furthermore, although the pathophysiologic mechanisms responsible for NAVMR remain poorly defined, the toxicologic effects of chemical air pollutants, odorant receptor polymorphisms, and attitudinal or behavioral responses to odors may be involved.^{17,19,20} An accurate phenotypic diagnosis of NAVMR is the first essential step in investigating the underlying mechanism(s) of this complex disorder. Once an unequivocal phenotype can be established, the likelihood of correlating this phenotype with specific DNA variant sites (ie, genotypes) becomes greatly increased.²¹

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Appendix 1.

Patient Rhinitis Screen

If you have upper respiratory symptoms please fill out this questionnaire. **By completing this questionnaire, you give your consent to participate in this study the purpose of which is to validate a rhinitis questionnaire.** Complete the entire questionnaire as best you can. A nurse will be available to help you.

Background

1. What is your age? _____ Years
2. How old were you when you first started having symptoms? _____ Years
3. Does a family member have allergies? Yes ☐ No ☐
4. Which family member(s)? _____

What are your symptoms?

Do you have symptoms

- | | |
|--|---|
| 5. With cat or cat hair? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | 17. With diesel or car exhaust fumes? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose |
| 6. With dogs or dog hair? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | 18. With smoke (from tobacco or other burning items)? No ☐ Yes ☐
→ Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose |
| 7. With feathers? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | 19. With perfumes or fragrances? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose |
| 8. With other furry pets? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | 20. With incense? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose |
| 9. In Spring outdoors? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | 21. With household cleaning products? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose |
| 10. In Summer outdoors? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | 22. With newsprint? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose |
| 11. In Fall outdoors? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | 23. With hairspray? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose |
| 12. With home dust cleaning? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | 24. With alcoholic beverages (beer or wine)? No ☐ Yes ☐
→ Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose |
| 13. After starting the furnace? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | 30. With spicy food No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose |
| 14. With moldy indoor areas? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | 31. During or after eating a meal? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose |
| 15. With freshly mowed grass? No ☐ Yes ☐ → Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | |
| 16. With sudden temperature changes from cold to hot or cold to hot? No ☐ Yes ☐
→ Please indicate which symptoms:
☐ Sneezing ☐ Stuffy nose ☐ Runny nose ☐ Postnasal drainage ☐ Itchy eyes or nose | |