Predictive Findings of Allergic Disease in Fiberoptic Nasolaryngoscopy

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ABSTRACT

Objectives/Hypothesis: To determine whether findings on fiberoptic nasolaryngoscopy beyond the nasal cavity can aid in diagnosis of atopy.

Study design: Case control analysis of patients undergoing fiberoptic nasolaryngoscopy and allergy testing at a single academic institution.

Methods: Patients who underwent flexible nasolaryngoscopy for either laryngeal or nasal symptoms and allergy testing by in vitro methods were divided into an atopic group and a non-atopic control group based on results of allergy testing. Three board-certified Otolaryngologists who were blinded to the atopic status and symptoms viewed 88 patient videos and filled out an 8 item endoscopic rating questionnaire for each. Correlation between rater scores: endoscopic findings and atopic status was calculated using Randolph’s multivariable kappa values and Mann-Whitney test.

Results: Intrarater reliability was moderate to perfect for all physicians on all questions (kappa 0.545-1.0). Interrater reliability was slight to fair (Kappa 0.143-0.399) for all questions and the overall impression of atopic disease. Abnormalities of the torus tubarius (p=0.007) and increased nasopharyngeal secretions (p=0.038) were predictive of atopic disease, while the presence of an adenoid (p=0.08) and impression of atopic disease (p=0.15) approached significance. All other endoscopic measures were not predictive of atopic status.

Conclusions: Fiberoptic nasolaryngoscopy findings within the nasopharynx, oropharynx, or larynx correlate with atopic status. The purpose of this study was to determine whether abnormalities of the nasopharynx, oropharynx, or larynx correlate with atopic status and can be helpful to aid in the diagnosis of allergic disease.

INTRODUCTION

Allergic rhinitis is a common chronic condition that affects between 10-15% of adults and an even higher proportion of children in industrialized nations, and has significant economic impact with the direct medical cost of care in the billions of dollars annually in the United States. The gold standard for diagnosis of allergic disease remains clinical with primary use of history and physical exam, and allergy testing used to confirm specific sensitizations. Understanding of physical findings in patients with allergic rhinitis is important in making a correct diagnosis of allergic rhinitis.

Allergic disease is not limited to the nasal passages, and the concept of the unified airway suggests that inflammation in one area can affect other areas of the aerodigestive tract as well including lower the airways. Increasing evidence is mounting that laryngeal and vocal symptoms can be attributable to allergic laryngitis, and that introduction of allergens into the larynx can result in vocal fold edema, an increase in laryngeal sympotms, as well as resulting in increases in the subglottic pressure needed to phonate. Laryngeal symptoms that have been attributed to allergic disease are non-specific and include hoarseness, cough, throat clearing, globus, excessive mucous, sore throat or throat discomfort, post nasal drip, itchy eyes, and nasal congestion. Because of the lack of specificity, recent reviews have also discussed the possibility of under-diagnosis of allergy and over-diagnosis of laryngopharyngeal reflux in these patients.

The purpose of this study was to determine whether abnormalities of the nasopharynx, oropharynx, or larynx correlate with atopic status and can be helpful to aid in the diagnosis of allergic disease.

MATERIALS AND METHODS

A retrospective case-control study was performed to review fiberoptic nasolaryngoscopy recordings of patients with symptoms of rhinitis and/or laryngitis who were evaluated at a tertiary medical center. Endoscopic findings of patients with a diagnosis of atopy were compared to those with non-atopic status. A diagnosis of atopy was made by clinic symptoms, physical findings, total IgE level >200, and at least one positive sIgE (ImmunoCap, Phadia, Sweden). Negative results were defined as a total IgE of less than 10, with no positive specific sIgE in vitro tests to any allergen antibody.

The recordings were reviewed by three independent board-certified otolaryngologists who were blinded to the clinical data and results of allergy testing. A 10-question rating system was used to measure the endoscopic findings relating to abnormalities of the nasopharynx, oropharynx, or larynx, as well as an overall impression of atopic status.

Repeated endoscopy recordings were used to generate a kappa value for intrarater reliability for each item in the questionnaire and each author. Multirater intrarater reliability with a Randolph free kappa was calculated. A Mann-Whitney U test was used to compare the average scores in each item between the atopic and the non-atopic group to determine differences between groups. This study was approved by the Institutional Review Board prior to commencing study.

RESULTS

Three otolaryngologists reviewed 88 recorded fiberoptic examenations on 77 subjects who met inclusion criteria (demographics in Table 1). Eleven examinations were repeated during the study, 6 from atopic group and 5 from the non-atopic group, to use as a measure of intrarater reliability. An average of 27 inhalant allergens were tested by ImmunoCAP. Thirty three subjects had a total IgE level >200 and at least one positive test (atopic group), whereas 44 had a total IgE <10 and no positive sIgE tests (non-atopic group).

Intrarater scores were moderate to perfect for all physicians on all questions (kappa 0.545-1.0, Table 2). Interrater reliability was slight to fair (Kappa 0.143-0.399) for all questions and the overall impression of atopic disease (Table 2, Figure 2). Comparison of atopic to non-atopic subjects for each question revealed significant differences for abnormalities of the torus tubarius (p=0.007) and increased nasopharyngeal secretions (p=0.038) (Figure 1). Other measures that did not show a difference included the posterior aspect of the inferior turbinate (p=0.69), adenoid (p=0.081), pharyngeal mucosa (p=0.53), laryngeal mucosa (p=0.63), nasopharyngeal secretions (p=0.038), laryngeal secretions (p=0.28), and overall impression of atopic diagnosis (p=0.15).

DISCUSSION

This study identified significant findings in the nasopharynx, increased nasopharyngeal secretions and abnormalities of the torus tubarius, that correlate with a positive atopic status and can be used for assisting in diagnosis. The findings in the oropharynx and larynx did not correlate with atopic status and may be nonspecific for inflammation relating to other conditions such as laryngopharyngeal reflux.

Importantly, endoscopic nasolaryngoscopy findings have been shown to have poor interrater reliability, and poor intrarater reliability. Interrater reliability was very high for the three reviewers in this study, which is in contrast to previously published findings in nasolaryngoscopy. Interrater reliability was low in the current study, which is consistent with previously published studies that evaluated endoscopy. The high intrarater findings suggest that standardization in training in interpretation of endoscopic findings could improve intrarater scores to similar levels, since the authors were able to reproduce their interpretations.

CONCLUSIONS

Findings of increased nasopharyngeal secretions and mucosal hypervascularity of the torus tubarius correlate with in vitro atopic testing.