

ASTHMA AND OTORHINOLARYNGOLOGIC DISORDERS

Müzeyyen Doğan, M.D.* / Emel Eryüksel, M.D.**
Tekin Bağlam, M.D.* / Turgay Çelikel, M.D.**

* *Department of Otorhinolaryngology, Head and Neck Surgery, School of Medicine, Marmara University, Istanbul, Turkey.*

** *Department of Pulmonary Medicine and Critical Care, School of Medicine, Marmara University, Istanbul, Turkey.*

ABSTRACT

Objective: Upper respiratory disorders such as allergic rhinitis and rhinosinusitis are different facets of a larger systemic inflammatory syndrome involving both the upper and lower airways. Effective treatment of sinonasal disease, which is one of the factors that exacerbate asthma, may also improve and stabilize the asthmatic condition. Patients with persistent asthma should be searched for otorhinolaryngologic disorders. The aim of this study was to determine whether there is an association between asthma and otolaryngologic disorders.

Methods: Forty-two asthmatic patients and 42 controls were examined for otorhinolaryngologic disorders by the same physician. Data were compared in groups by using Fisher's Exact Test.

Results: Eighty-nine percent of the asthmatic patients were shown to have associated otorhinolaryngologic disorders which is significantly higher than in the controls (42%), ($p < 0,0001$).

Conclusion: Upper respiratory disorder is a very common comorbidity of asthma and common mechanisms exist. The nasal and sinus inflammation in asthmatics seems to be related

specifically to asthma and is not a feature of all bronchial diseases. The presence of upper respiratory disorders should always be investigated in adults with asthma. Treatment of nasal conditions confers significant protection against asthma exacerbations.

Key Words: Asthma, Allergy, Polyps, Vocal cord dysfunction, Posterior laryngitis, Candidiasis.

INTRODUCTION

Asthma is a chronic inflammatory disease of the lower respiratory tract which is triggered by exposure to allergens or other airway irritants. Even since the late 19th century, a relationship has been suspected between upper airway disease and the subsequent development or aggravation of asthma symptoms. To date, it has been generally accepted that pathologic conditions of the upper airways, e.g. allergic rhinitis, chronic sinusitis and nasal polyps, may influence the lower airways (1).

In this paper we investigate the most common otorhinolaryngologic disorders in asthmatic patients because of the interaction between the upper and lower respiratory systems.

MATERIALS AND METHODS

Forty-two asthmatic and 42 nonasthmatic subjects were included in the study. The asthmatic subjects had stable symptoms at the time of the study, and no history within the preceding 2 months of respiratory infection, or antibiotic or oral corticosteroid use, and were treated only with inhaled bronchodilators. Asthma was defined according to the American Thoracic Society definition and all patients had mild or moderate asthma in this study (2). The average disease duration was 98,55 months (6-420 months). None of the nonasthmatic subjects had asthmatic symptoms or required inhalational therapy. The study was approved by the Marmara University Hospital Ethics Committee and written informed consent was obtained from each subject. There were 36 females and 6 males in the asthmatic group and 15 males and 27 females in the control group. The average age of the control subjects and asthmatics was 41 years and 42,6 years respectively. There was not any difference between control and asthmatic

groups according to age and sex distribution. Ear, nose and throat (ENT) examination was performed in these two groups by same physician. Asthmatic patients and controls were examined by anterior rhinoscopy and endoscopic investigation with a 0° rigid endoscope (Storz).

RESULTS

The data were compared in groups between patients with bronchial asthma and those without (control group), using Fisher's Exact Test. A 'p' value <0,05 was considered significant. We found that 98% of the asthmatic patients had otorhinolaryngologic disorders and this was significantly higher than in the controls (42%), (p<0,0001) (Fig 1). The highest prevalence of otorhinolaryngologic disorder was posterior laryngitis (p<0,0001). Other otorhinolaryngologic disorders observed in this study were polyps (p:0,1160, p>0,05), candidiasis (p:0,4940, p>0,05), chronic pharyngitis (p:0,0072, p<0,01), septal deviation (p:0,999, p>0,05), vocal cord

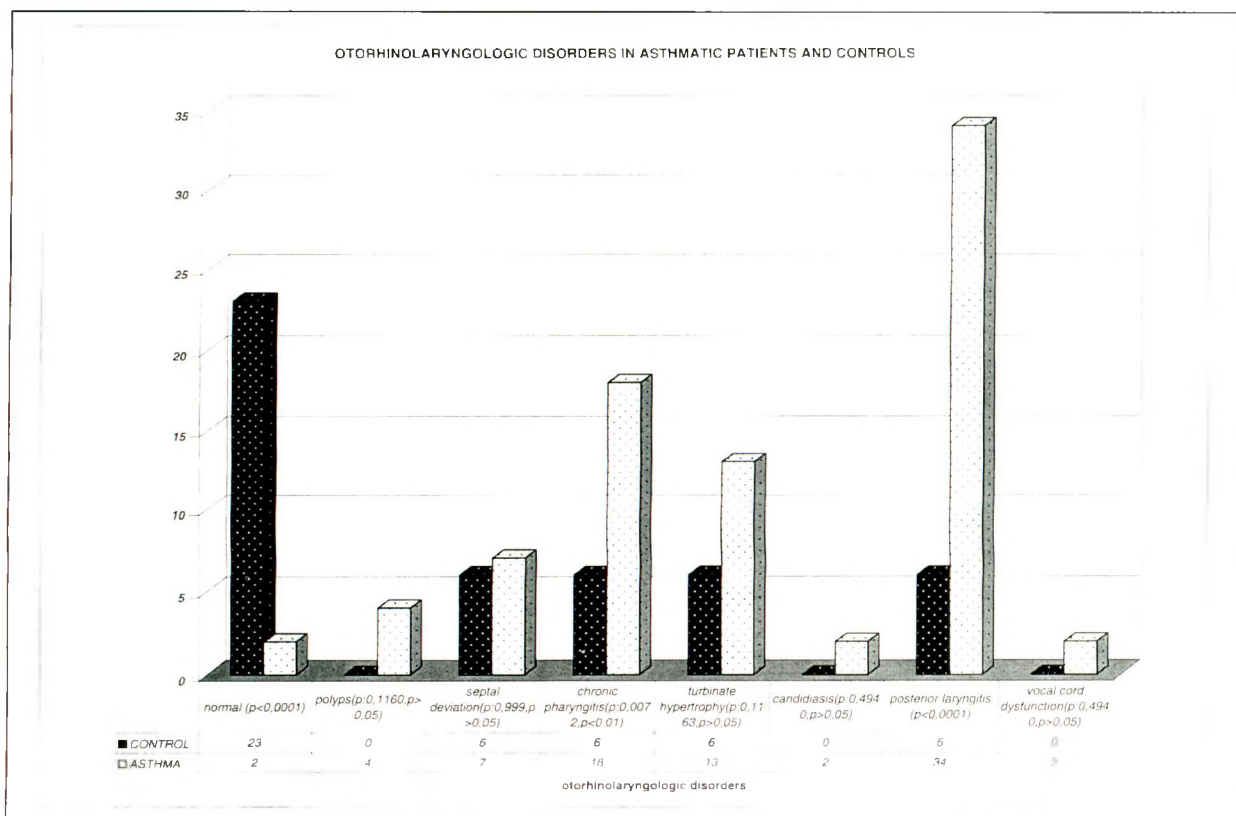


Fig. 1: Otorhinolaryngologic disorders in asthmatic patients and control. Polyps, Septal deviation, Chronic pharyngitis, Turbinate hypertrophy, Candidiasis, Posterior laryngitis and VCD= Vocal Cord Dysfunction were otolaryngologic disorders which have been determined in this study.

dysfunction $p:(0,4940, p>0,05)$ and turbinate hypertrophy $(p:0,1163, p>0,05)$ were other otorhinolaryngologic disorders which have been determined in this study (Figs 2, 3).

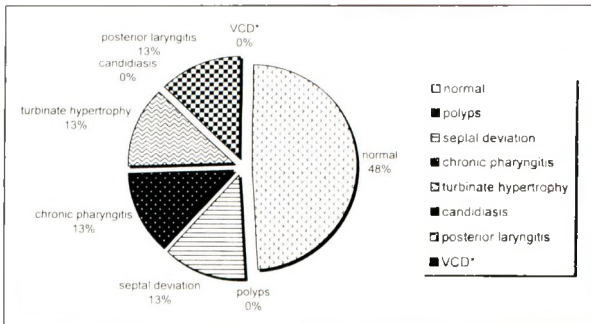


Fig.2: Distribution of otorhinolaryngologic disorders in the control group. *VCD= Vocal Cord Dysfunction. 48% of controls have normal findings of ENT examination.

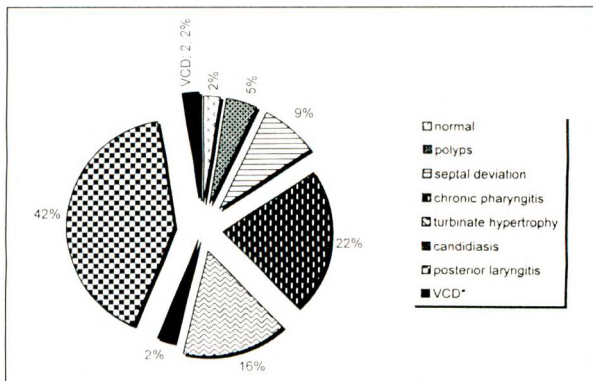


Fig.3: Distribution of otorhinolaryngologic disorders in asthmatic patient. In asthmatic group most common otorhinolaryngologic disorder is posterior laryngitis in this study.

DISCUSSION

The upper airways--the nose, pharynx, and mouth--lead through the larynx and into the tracheobronchial tree of the lung (the lower airways). This cavernous void in the upper airways transports external air to the alveolar sacs, in the distal segments of the tracheobronchial tree. Under adverse physiologic conditions such as allergic or nonallergic rhinitis, sinusitis, and bronchitis, obstruction of the upper and lower airways occurs and leads to sneezing, rhinitis, and bronchospasm (3).

In a recent report from the American Academy of Allergy, Asthma and Immunology, it was

estimated that up to 78% of asthma patients have nasal symptoms and 38% of allergic rhinitis patients have asthma (4). This is in accordance with the results from an analysis of the European Community Respiratory Health Survey data, showing that rhinitis is associated with an increased risk of asthma in nonatopic subjects with normal immunoglobulin-E levels (5). Patients with allergic rhinitis exhibit increased eosinophil activity in both upper and lower airways. In these patients, nasal allergen challenge can induce increased bronchial hyperresponsiveness, suggesting that upper and lower airway disorders share common inflammatory features. Treatment of rhinitis symptoms has been shown to produce better asthma symptom control and, in a few studies, the improvement of airway function in patients with concomitant asthma. In dosages used to treat allergic rhinitis, these agents have been shown to decrease asthma symptoms, and in some instances, improve lung function and reduce requirements for bronchodilators (6-9). In this study we determined that asthmatic patients have more allergies than controls ($p<0,0001$). Turbinate hypertrophy and septal deviation were determined in asthmatic patients more than in controls but were statistically insignificant ($p:0,1163$), ($p:0,999$).

Whenever individuals with asthma get a sinus infection, the asthma worsens. When accompanied by a sinus infection, the asthma cannot be treated with simple drugs. When the nose obstructs, these individuals breathe with the mouth open, which precipitates an asthma attack. Possible mechanisms by which asthma could be worsened by sinus disease include neural reflex pathways and interference with the important nasal functions of heating, humidification, and filtration. Patients with asthma have a dry mouth all the time and are bothered by thick nasal phlegm dripping into the throat. The thick phlegm causes these patients to cough and try to clear the throat constantly. These pharyngeal irritations cause chronic pharyngitis. In this study we determined that asthmatic patients have chronic pharyngitis more than controls ($p<0,01$).

Myofibroblasts are related to airway remodelling and may play an important role in the pathogenesis of the histological features of nasal

polyps associated with asthma (10). In many studies it was demonstrated that endoscopic sinus surgery (ESS) has a favorable effect on asthma in patients with symptomatic chronic sinusitis and polyps (11). In this study we recommended ESS for 4 asthmatic patients with polyps and chronic sinusitis (12).

In addition to the above factors, recognition of laryngopharyngeal reflux (LFR) as an irritant that brings on asthmatic symptoms, as well as throat and laryngeal symptoms, is increasing (13). When the larynx was viewed with a mirror or endoscope, the arytenoids were observed to be inflamed, especially posteriorly. In this study, posterior laryngitis was determined more than in controls ($p < 0.0001$) and we started medical therapy for LFR. Vocal cord dysfunction (VCD) can be characterized as an abnormal adduction of the vocal cords during the respiratory cycle (especially during the inspiratory phase) that produces airflow obstruction at the level of the larynx. VCD frequently mimics persistent asthma and is often treated with high-dose inhaled and/or systemic corticosteroids, bronchodilators, multiple ED visits, hospitalization, and, in some cases, tracheotomies and intubations. The various etiologies include cortical injury involving either upper or lower motor neurons, brainstem compression, conversion disorder, malingering, and irritant induced such as laryngopharyngeal reflux (14). In this study two patients were determined with VCD. One of these patients was a 55-year-old woman with paradoxical vocal cord adduction who presented with asthmatic symptoms as wheezing and stridor. She had been treated for bronchial asthma without any improvement. After laryngeal examination with 70° rigid endoscope (Storz), we observed posterior laryngitis with dysfunctional vocal cord movement induced by laryngopharyngeal reflux. After laryngopharyngeal reflux treatment during 6 months, the respiratory symptoms were dissolved. Another patient with VCD who presented with asthmatic symptoms was a 51-year-old woman. She had laryngopharyngeal reflux and psychological problems. In addition to medical treatment for LFR and consultation at the Department of Psychiatry, we started to teach her diaphragmatic breathing exercises. Her respiratory symptoms partially dissolved after initial therapy of one month's duration. Now, she is on follow up visits.

Inhaled steroids such as fluticasone propionate and beclomethasone dipropionate play a central role in the treatment of bronchial asthma. One of the previous studies reported that the amount of *Candida* spp. was significantly greater in asthmatic patients taking inhaled steroids compared with those who were not (15). The most common drug-related adverse events were those expected with the administration of topical inhaled glucocorticosteroids (oropharyngeal candidiasis and dysphonia), and they occurred at higher incidences in the inhaled fluticasone propionate treatment groups than in the placebo or oral fluticasone propionate treatment groups (16). In this study after the ENT examination we determined oropharyngeal candidiasis in two asthmatic patients and we applied antimycotic treatment.

The epidemiologic and clinical studies have shown that there is a strong relationship between upper airway pathology and asthma. The mechanisms of nasobronchial interaction have been discussed intensively and most recent studies provided proofs in favor of a systemic pathway, involving bloodstream and bone marrow. The determinants of clinical phenotype in allergic airway disease is still not clear. Generalized airway inflammation is present in patients with allergic rhinitis, sinusitis and nasal polyposis, even in the absence of clinical asthma. Further studies are needed to show that these subjects represent a group at risk for the development of asthma.

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