upper gastrointestinal endoscopy (UGE), 24-hour pH monitoring and manometry. Many patients also present chronic posterior laryngitis in fibrosalaryngoscopy (FNL). The objective of the present study was to evaluate the diagnosis of esophagitis, by FNL and UGE in patients with chronic cough.

Methods: Patients followed up for chronic cough, over 18 years of age, were asked about the presence of GERD symptoms and submitted to the FNL and UGE, some of them with esophageal biopsy.

Results: Fifty-one patients participated in the study. The average age was 56.8 years (±13.2 years), 90.2% were female and the average duration of cough, 12.2 years (±14.9 years). Of these, 46 (90.2%) had dyspepsia, and partial or complete improvement of symptoms of cough with proton pump inhibitor. Of the 46 symptomatic patients, only 18 (39.1%) had esophagitis on UGE; however, 36 patients (78.3%) had posterior laryngitis on FNL. Seventeen patients also underwent esophageal biopsy, and 15 examinations identified esophagitis. Nine (60%) of these patients had only posterior laryngitis on the FNL (UGE without esophagitis).

Conclusions: Fibrosalaryngoscopy was more sensitivity than upper gastrointestinal endoscopy to confirm gastroesophageal reflux disease. Although the indication for biopsy of esophagus follows standardized criteria, this study suggests that in patients with chronic cough, if there is an indication for the performance of UGE, it would be interesting to complement with biopsy of the esophagus.

316 Botox Injections in Larynx as a Treatment for Vocal Cord Dysfunction
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Background: Vocal Cord Dysfunction (VCD) is a respiratory condition in which vocal cords restrict airflow by closing during inspiration. Symptoms include shortness of breath, coughing, chest tightness and wheezing. These symptoms are commonly reduced with breathing exercises to relax the chest and throat. VCD is often misdiagnosed as asthma and treated as such. Studies have shown that steroids used to treat asthma are not beneficial in the treatment of VCD, and are therefore unnecessary. Recent studies suggest that Botox injections to relax the thyroarytenoid muscles surrounding vocal cords resulting in an improvement in the patient’s airflow.

Methods: We followed a 56-year-old female patient over the course of a year who had a history of upper respiratory infections, sinusitis, allergic rhinitis and asthma reporting an increase in the severity of respiratory symptoms even though successfully undergoing immunotherapy treatment and following a regimen of asthma medication. Her symptoms included shortness of breath, wheezing and trouble sleeping.

Results: Pulmonary function testing done elsewhere revealed that the patient had a reduced lung capacity. After a consult with a speech pathologist, VCD and Spastic Dysphonia (SD) were diagnosed. The symptoms where initially treated with speech therapy. Four months later the patient noted a slight improvement in her symptoms, but also attributed this to the fact that she had developed behavioral ways to cope with symptoms. The possibility of Botox injections was mentioned and the patient agreed to follow with this treatment. Two 2.5 unit injections of Botox were administered in the thyroarytenoid muscles via an EMG guided needle, without any complications. The results from the procedure were very favorable. All her symptoms improved significantly. Lung function tests appeared normal, and she was able to reduce the use of most asthma control medications. She received another dose of Botox injections 6 months following the first, and continues to do very well.

Conclusions: Botox injections in the thyroarytenoid muscles are a successful treatment option for VCD patients with dysphonia. With this treatment patients are able to minimize respiratory symptoms and inhaled steroid use. A larger, randomized study with patients diagnosed with VCD alone should be considered.

317 Myasthenia Gravis and Asthma, Relationship between Two Different Disorders of the Immune System
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Background: Myasthenia gravis is an autoimmune disease caused by absence of neuromuscular transmission due to antibodies directed against the nicotinic AChR located at the neuromuscular junction. The main symptoms include muscle weakness in the affected muscles, which is worse after its use. Diagnosis is made upon clinical manifestations and finding of IgG. Only 80 to 90% of patients with generalized disease are positive to these antibodies, and 30 to 50% with ophthalmologic manifestations. Other immunological alteration found in these patients is an overexpression of the low affinity IgE receptor (CD23). Asthma is characterized by shortness of breath, cough, wheezing and chest tightness caused by inflammation and a reversible contraction of bronchial smooth muscle. Immunologically is associated with a Th2 cytokine profile, mainly II-4, II-5, II-13 and an increased IgE.

Methods: Allergic and autoimmune diseases represent an altered response of the immune system. Here we discuss the case of a patient who presented with an allergic disease at first then years later developed an autoimmune disease.

Results: Our patient had been diagnosed with persistent allergic rhinitis and asthma since 1992. He had been treated with inhaled corticosteroids, bronchodilators, intranasal corticosteroids, antihistamines and specific immunotherapy with control of symptoms. In June 2010 he noticed diplopia, palpebral ptosis and muscle weakness in upper extremities diagnosed with Myastenia gravis and started treatment with pyridostigmine with adequate control of muscular symptoms. No thymoma was identified.

Conclusions: It has been noted the possible relationship between allergic and autoimmun diseases since in both there is an alteration in the regulatory mechanisms of the immune system. In this patient, we found the association between asthma and 19 years later the development of myasthenia gravis. Some of the explanations for this kind of association is the expression of CD23 in myasthenia gravis, which is a receptor found in B cells, among others, responsible of the increased production of IgE. Besides, autoimmune and allergic diseases share some pathogenic characteristics such as their influence by viral infections. They are one of the main factors associated with asthma exacerbations and it is suggested that they cause tissue damage, exposure to self-antigens and molecular mimicry.

318 Immunological Characteristics of Patients with Bronchial Asthma and Obesity
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Background: The problem of obesity-related diseases is current and worldwide increasing. We aimed to estimate the relationship between obesity, its biomarkers and immunological features of bronchial asthma (BA) in obese patients as compared to healthy people with different BMI.

Methods: Body mass index (BMI) was evaluated in 57 adult patients with atopic BA, 23 patients with allergic rhinitis (AR) and 25 healthy people. Spontaneous production of TNF-α and IL-4 from blood lymphocytes and levels of C reactive protein (CRP), total IgE and leptin were detected in serum samples using ELISA kits. Levels of IgE, autoAbs to keratin, III and VI collagen types and elastin that showed association with BA severity in our previous data were also measured by ELISA.

Results: Atopic patients with BMI > 30 kg/m2 in groups with AR and with BA had elevated levels of C-reactive protein (744 ± 28 ng/mL) and high spontaneous production of TNF-α (45 ± 4 ng/mL) and IL-4 (9.5 ± 2.8 ng/mL) in comparison with normal-weight patients and healthy (7.3 ± 2.7)
ng/mL, 3 ± 0.6 ng/mL and 1.7 ± 0.3 ng/mL accordingly). BMI was considerably associated with BA severity (R = 0.4) and IgE-autoreactivity only in obese asthmatics (R = 0.58; P = 0.01), which showed raised IgE-autoAbs to keratin (11.6 ± 2 IU/mL) and collagen III (1.03 ± 0.3 IU/mL) in comparison with preobe (6.7 ± 1.5 IU/mL, 0.3 ± 0.01 IU/mL) and nonobese patients. The levels of total IgE in all groups showed no association with BMI and serum leptin concentration. Leptin level correlated with CRP (R = 0.59) and BMI (R = 0.4) and appeared to be overproduced in obese (75 ± 7.1 ng/mL) vs non-obese (23 ± 6 ng/mL) asthmatics, as compared with AR patients and healthy subjects independently from BMI (6.1 ± 0.3 ng/mL) and therefore was associated with BA but not atopy in overweight patients.

Conclusions: In obese patients with atopy the adipose mass represents an important source of inflammatory cytokines whereas it’s mediators, such as leptin appears to impact especially in pathogenesis of BA in comparison with AR. Obesity is attended with higher generation of autoIgE-Abs, which elevated levels can indicate the disturbance of normal immune regulation. So asthmatics with higher BMI, show a special phenotype of disease which needs to be managed and treated distinctly.

**ASTHMA DIAGNOSTIC TOOLS**

### 319 Bronchial Hyperresponsiveness in Obese Adolescents

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**Background:** Identify the frequency of bronchial hyperresponsiveness in the obese and morbid obese adolescent. Compare the results of the direct challenge with gender and BMI.

**Methods:** We analyzed 215 bronchoprovocation challenges of adolescents from 10 to 18 years old in the period 2006 to 2010. We classified them in 3 groups: eutrophic (BMI < p85), obese (BMI p90-99) and morbid obese (BMI > p99) without smoking contact of pulmonary disease. A basal spirometry was performed according to the ATS guidelines. If the FEV1 was above 80% for age and gender we performed the methacholine challenge. We use the dosimeter method with the following methacholine dilutions: 0.0625 mg, 0.25 mg, 1 mg, 4 mg and 16 mg. When a provocation concentration caused a 20% FEV1 reduced was considered a positive challenge for bronchial hyperresponsiveness (BHR).

**Results:** Of the 215 adolescents in this study: 40 were eutrophic, 116 obese and 59 morbid obese. The methacholine challenges were positive in 12% of nonobese patients. The levels of total IgE in all groups showed no association with BMI and serum leptin concentration. Leptin level correlated with CRP (R = 0.59) and BMI (R = 0.4) and appeared to be overproduced in obese (75 ± 7.1 ng/mL) vs non-obese (23 ± 6 ng/mL) asthmatics, as compared with AR patients and healthy subjects independently from BMI (6.1 ± 0.3 ng/mL) and therefore was associated with BA but not atopy in overweight patients.

**Conclusions:** In obese patients with atopy the adipose mass represents an important source of inflammatory cytokines whereas it’s mediators, such as leptin appears to impact especially in pathogenesis of BA in comparison with AR. Obesity is attended with higher generation of autoIgE-Abs, which elevated levels can indicate the disturbance of normal immune regulation. So asthmatics with higher BMI, show a special phenotype of disease which needs to be managed and treated distinctly.

### 320 Development of a Questionnaire for the Assessment of Bronchial Hyperresponsiveness in Korea

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**Background:** Bronchial hyperresponsiveness (BHR) is an important pathophysiological feature of asthma. In addition to the diagnostic significance, BHR is associated with the severity of airway inflammation and BHR- based treatment approaches has been shown to be effective. Nevertheless, challenge tests are time consuming, inconvenient to patients, and are not accessible in every primary care physicians. We aimed to develop a questionnaire for the assessment of BHR in Korean subjects.

**Methods:** From the 24 University-affiliated hospitals, we recruited 149 adults between age 20 and 40 years with more than one asthmatic symptom (cough, sputum or dyspnea) and who had bronchial provocation test. A list of 33 symptoms, past history of allergy or smoking and 10 provoking stimuli were selected for the BHR questionnaire. After a methacholine challenge test patients were asked to complete each questionnaire. For each item of questionnaire, diagnostic odds ratios for the presence of BHR were calculated and multiple logistic regression analysis was performed to select final questionnaire items. Receiver operating characteristic (ROC) curve analysis was used to evaluate the sensitivity and specificity of the selected questionnaire items.

**Results:** Methacholine challenge test was positive in 36 patients (24.2%). Eleven symptoms and 2 provoking stimuli items were statistically significant by the results of diagnostic odds ratio. According to the result of multiple logistic regression analysis, 4 items were finally selected for the significant BHR questionnaire: the presence of wheezing episode, past history of physician-diagnosed asthma, family history of asthma. The psychiatric stress was negatively associated provoking stimuli item for the presence of BHR. The area under the ROC curve was 0.80 (95% CI, 0.72-0.86). Sensitivity was 84.9% (95% CI, 68.1-94.9) and specificity was 65.5% (95% CI, 55.8-74.3).

**Conclusions:** Four BHR questionnaire items including wheezing episode, past history of physician-diagnosed asthma, family history of asthma and psychiatric stress stimuli were able to assess the presence of BHR in Korean adults.

### 321 Clinical Analysis of Salbutamol Responsiveness after Acetylcholine-induced Bronchoconstriction in Childhood Asthma

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**Background:** The bronchodilator is usually inhaled after the acetylcholine (Ach) inhalation test for asthmatic patients. We investigated clinical characteristics of asthma about the response to a inhalation of salbutamol after the Ach provocation test.

**Methods:** Asthmatic patients from 6 to 18 years old were examined. They inhaled aerosol with increased concentration of Ach to produce 20% or more decrease in FEV1.0 (RT-Ach point). After then they inhaled salbutamol, and respiratory function was examined after 0, 5, 10, and 15 minutes. We divided the patient into 4 groups (G0,G5,G10,G15) by the recovery time up to baseline FEV1.0 after inhalation of salbutamol.

**Results:** Pre- provoked baseline FEV1.0, the rate of actual FEV1.0 / predictive FEV1.0, RT-Ach and FEV1.0 at the point of RT-Ach were lower in the G0 than other groups significantly. Complication of exercise induced asthma (EIA) and increased rate of FVC after the inhalation of salbutamol were higher in the G0. Serum IgE, eosinophil count of peripheral blood was not different in these groups.

**Conclusions:** We investigated about the response to salbutamol after the provocation of Ach for childhood asthma. Bronchial constriction and...