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Title: Factors predicting airflow obstruction in severe asthmatics

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Body: Severe asthma was defined as “treatment-resistant severe asthma” and includes asthmatics on highest level of recommended treatment (high-dose Inhaled Corticosteroids (ICS) or high-dose ICS plus Long-Acting Beta- Agonist combination) ¹. Airway remodeling was defined as $FEV_1 \leq 60\%$. Factors predicting remodeling were studied which include demographic profile, duration of asthma, allergen sensitization, presence of bronchial hyper-responsiveness, asthma-related comorbidities and frequency of asthma exacerbations. 207 fulfilled severe asthma definition. Amongst these patients, 59 had airway remodeling. Airway remodeling was associated with increasing number of allergen sensitization ($p=0.032$). Amongst those with 5-8 allergen sensitization, 37.5% ($n=12$) had $FEV_1 \leq 60\%$. In comparison, 15.9% ($n=7$) had $FEV_1 \leq 60\%$ amongst those with 1-4 allergen sensitization. The presence of bronchial hyperresponsiveness on methacholine challenge test, significant bronchodilator response and smoking were also significantly associated with $FEV_1 \leq 60\%$ ($p < 0.001$, $p < 0.001$, $p = 0.011$ respectively). Frequency of asthma exacerbations (steroid burst, admissions and unscheduled emergency department visits), duration of asthma and presence of asthma related co-morbidities were not significantly associated. We have found that patients with broader spectrum of allergen sensitization were more likely to have airway remodeling. Early detection of allergen sensitization may be important and aggressive treatment of allergies may be able to arrest or reverse the remodeling process. Our findings concur with previous reports of presence of bronchial hyperresponsiveness, bronchodilator response and smoking being risk factors for remodeling.