The Role of Diagnostic Bronchoscopy in Refractory Asthma Management

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Introduction and Background

Refractory asthma is an uncommon entity, manifesting in less than five percent of asthmatics and characterized by high medication requirements, persistent symptoms, frequent exacerbations, and significant airflow obstruction despite standard medical therapy.[1] Bronchoscopy may be an effective tool for identifying refractory asthma phenotypes.[3] The objective of this case series is to demonstrate the use of bronchoscopy to personalize treatment among a population of refractory asthmatics.

Materials and Methods

This was a retrospective, observational chart review of patients from a single outpatient pulmonary office. Patients who met the American Thoracic Society guidelines for refractory asthma and who underwent elective phenotyping bronchoscopy between October 2017 and March 2019 were included in the review. Diagnostic bronchoscopic evaluations were performed following a framework laid out by Good et al., with a focus on identifying laryngopharyngeal reflux (LPR), subacute bacterial infection (SBI), and eosinophilia by endobronchial biopsy and bronchoalveolar lavage (BAL).[3]

Results

Prior to bronchoscopy, five patients required daily oral steroid therapy with doses ranging from 3mg to 80mg and two patients were receiving biologic therapies. Bronchoscopic evaluation identified two patients with eosinophilic asthma, three patients with a mixed phenotype of combined LPR and eosinophilic asthma, and one patient with a mixed phenotype of SBI (Stenotrophomonas maltophilia) and eosinophilic asthma. Eosinophilic asthma was determined by BAL eosinophils (range 1%-18%) despite oral prednisone therapy in five patients. Tissue eosinophilia was confirmed in three patients (range 1-15 eos/hpf), one of whom had no eosinophils by BAL.

Following bronchoscopy, four patients were initiated on biologic therapy (benralizumab, omalizumab), one patient was transitioned from mepolizumab to benralizumab, G Erd therapy and one patient had no eosinophils by BAL.

Conclusion

As our comprehension of disease pathogenesis and the treatment options at our disposal expand, the role for precision medicine in asthma becomes increasingly evident. To date, most phenotyping of asthma has been non-invasive and includes spirometry, fractional exhaled nitric oxide (FeNO), and serum eosinophilia. Bronchoscopy can provide unique information that can improve personalized care in patients with refractory asthma. The planned next step involves formal integration of bronchoscopy into a clinical pathway for management of our asthmatic patients, as detailed below.

References