Public Lecture by David Broide MB.ChB., Associate Professor of Medicine
New Insight into the Cause and Treatment of Asthma
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Asthma is a common condition affecting approximately 5-10% of the USA population. Although the prevalence of asthma is highest in children, epidemiologic studies demonstrate that the prevalence of active asthma continues to be high in later life affecting approximately 6% of men and women aged 60 –75. Although wheezing and shortness of breath are cardinal features of asthma, the same symptoms can be due to diseases other than asthma. In the elderly cardiac disease, pulmonary embolism, adverse drug reactions to aspirin or blood pressure medications (ACE inhibitors or beta blockers) can mimic asthma and should be excluded before making the diagnosis of new onset asthma in the elderly.

Asthma is characterized by the development of reversible airway obstruction which can be precipitated by a variety of different stimuli including inhaled allergens, viruses, aspirin, exercise, irritants, and pollutants. The airway of an asthmatic patient differs from the airway of a non-asthmatic patient in that it is infiltrated with inflammatory cells. Once in the lung these inflammatory cells release pro-inflammatory mediators which cause the smooth muscle surrounding the airway to constrict. Repeated episodes of airway inflammation and constriction can induces changes in the airway wall termed airway remodeling. Whether these airway remodeling changes are irreversible and contribute to loss of lung function over time is an area of active research.

Current recommendations for the therapy of asthma include the use of symptomatic reliever therapy (i.e. beta agonist metered dose inhalers) and anti-inflammatory therapy (i.e. inhaled corticosteroids). Anti-inflammatory therapy is indicated in individuals who use symptomatic beta agonist metered dose inhalers to relieve symptoms more than three times per week. Although very effective at relieving bronchial constriction, the beta agonist metered dose inhalers do not reduce the airway inflammation which is the driving force for the bronchial tube constriction. Thus, other than mild asthmatics who only infrequently need to use a reliever bronchodilator, asthmatics with persistent symptoms and inflammation should be treated with anti-inflammatory therapy such as an inhaled corticosteroid. Leukotriene inhibitors are an alternative to inhaled corticosteroids. The advantage of leukotriene inhibitors is their convenience (once a day administration) and ease of administration (oral tablet) compared to inhaled corticosteroids which are generally administered twice a day by inhalation. However, inhaled corticosteroids are generally more potent than leukotriene inhibitors in controlling asthma symptoms. Therapy should thus be individualized in asthmatics to ensure that the most effective, safe and convenient therapy is utilized. On the horizon are novel therapies such as anti-IgE (reduces levels of the allergic antibody IgE by over 95%) which may be particularly helpful in moderate to severe asthmatics by reducing their need for oral corticosteroids.

The unraveling of the genetic components as well as the basic mechanisms responsible for the development of asthma increases the likelihood that even more effective therapies to prevent and treat asthma will soon be available.