Occasional Survey

Noninvasive Monitoring of Airway Inflammation in Childhood Asthma

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Abstract

Airway inflammation plays a central role in the pathogenesis of asthma. Accurate assessment of the degree of airway inflammation may allow us to fine-tune the anti-inflammatory treatment. There are many methods of assessing the degree of airway inflammation such as bronchial biopsy and broncho-alveolar lavage. These methods, however, are invasive and can be very difficult to perform in children. Monitoring of induced sputum eosinophils and measurement of bronchial hyperresponsiveness has been found to be useful in adjusting asthma treatment. However, these measurements are not easily performed in the primary care setting. A simple noninvasive measurement of inflammation would be extremely useful to guide individual asthma therapy in the childhood population. Exhaled nitric oxide (eNO) has been found to be measurable in exhaled air and its level has been found to be increased in asthmatic. Use of inhaled corticosteroid can reduce asthma symptoms and eNO. Accurate and reliable tools in measuring eNO are now commercially available. Many research studies in the past few years have confirmed that eNO can be used for the diagnosis, monitoring of control, and guiding treatment of anti-inflammatory therapy. Recent prospective studies have suggested that the addition of eNO monitoring would allow clinicians to use lower dose of inhaled steroid without compromising asthma control. Analyses of exhaled breath condensate (EBC) have been extensively investigated as another possible way to monitor airway inflammation. A variety of makers of inflammation can be measured in the EBC such as cytokines, chemokines, leukotrienes, and hydrogen peroxide. Further research is necessary to standardise the methodology of collection of EBC. Prospective trials are needed to confirm that the additional monitoring of these markers in the EBC may result in better control of asthma and optimal dosing of anti-inflammatory therapy in asthmatics.

Keyword: Asthma; Child; Monitoring; Noninvasive