MODERN TECHNIQUES OF SPUTUM ANALYSIS FOR BRONCHIAL ASTHMA

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Bronchial asthma is a condition in which a person’s airways become inflamed, narrow and produce extra mucus. Symptoms include periodic attacks of coughing, wheezing, shortness of breath and chest tightness. Modern techniques of sputum analysis have recently come forward as essential clinical tools for the diagnosis and treatment of different obstructive pulmonary diseases, asthma being one of them. Regular analysis of sputum can reduce severity of symptoms of asthma by combination with treatment accordingly.

Spirometry estimates narrowing of brochial tubes by checking how much air can be exhaled by a deep breath. Sputum eosinophils looks for specific WBC discharged by coughing. Eosinophils are present when inflammatory symptoms develop and stain pink with eosin. Sputum eosinophil testing however, isn’t a very effective method a third of asthmatics have non-eosinophilic lower airway inflammation. X-rays and CT-scans of the lungs and sinuses can identify any structural abnormalities or infections that can aggravate breathing problems.

Until recently bronchoscopic evaluation has been relied upon to collect specimen from lower airways to evaluate lung inflammation or infection. The technique however, is invasive and require local or sometimes general anesthesia. In patients with severe asthma in whom it is not possible to collect samples as it may worsen the symptoms.

Modern techniques of sputum analysis are noninvasive (use of spontaneous or induced sputum) and cell counts in sputum are intensely accurate and sensitive to identify the presence, type and severity of inflammation. Sputum can be induced by inhalation of hypertonic saline solution. This can cause bronchoconstriction in some that can easily be reversed by bronchodilators. Sputum induction cannot be carried out in patients with low lung volume. Sputum can be examined microscopically and other techniques such as NMR Spectroscopy. Sputum analysis provides the opportunity to gauge the degree of inflammatory cell activation, an important indicator for treatment and management of the disease. In some cases patients may not be able to generate sufficient sputum for analysis and will have to resort to invasive techniques. Using NMR it is possible to detect and quantify amount of metabolites in samples.

Sputum analysis is a noninvasive technique for the analysis of cellular and inflammatory indices in asthma. The technique however requires appropriate trained sputum laboratory staff. It is useful for continuous monitoring to modify drug treatment accordingly. The different techniques can be slightly costly. Bronchoconstriction can be reversed by bronchodilators however there is no way to get around low sputum amount. The technique is safe for children and adults, with no adverse effects. The advantages out way all other risks if any.