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Introduction

Chronic obstructive pulmonary disease (COPD) and asthma are characterized by a combination of clinical, physiological and pathological findings. The diagnoses of COPD and asthma are based on the presence of characteristic symptoms and lung function measurements. The two diseases differ in the characteristic symptoms, lung function measurements, responsiveness to bronchodilators and airway inflammation. However, similar clinical and physiological features are observed in both diseases, and some patients with COPD also have features of asthma and inflammation of the airways. Particularly in older people with obstructive airway disease, there is overlap in the diagnoses of asthma and COPD. The differential diagnosis of COPD and asthma is particularly important because of their distinct clinical outcomes in terms of morbidity and mortality, which require different therapeutic approaches. Accurate diagnosis of overlapping asthma and COPD is also important because patients with overlap of the two diseases could be treated with a combination of inhaled corticosteroids (ICS) and long-acting β2 agonists (LABA), with or without long-acting anti-cholinergics. This APSR Respiratory Update focuses on recent publications on the topic of overlapping asthma and COPD, and the differential diagnosis of COPD and asthma.

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The overlap syndrome of asthma and COPD: what are its features and how important is it?

Authors: Gibson PG, Simpson JL
URL: http://thorax.bmj.com/content/64/8/728.long

Comment: This article is the most recent comprehensive review regarding the clinical characteristics and features of airway inflammation in overlapping asthma and COPD.

Distinct clinical phenotypes of airways disease defined by cluster analysis

Authors: Weatherall M et al.
URL: http://erj.ersjournals.com/cgi/content/full/34/4/812

Comment: Airways disease is currently classified using diagnostic labels such as asthma, chronic bronchitis and emphysema. The definitions currently used for these classifications may not reflect the phenotypes of airways disease occurring in the community, which may have differing disease processes, clinical features or responses to treatment. The aim of the present study was to use cluster analysis to explore clinical phenotypes in a community population with airways disease. A random population sample of 25-75-year-old adults underwent detailed investigation, including a clinical questionnaire, pulmonary function tests, nitric oxide measurements, blood tests and chest computed tomography. Five distinct clinical phenotype clusters were identified. Further studies are needed to clarify responses to treatment in these five groups.

Exhaled breath profiling enables discrimination of chronic obstructive pulmonary disease and asthma

Authors: Fens N et al.
URL: http://ajrccm.atsjournals.org/cgi/content/full/180/11/1076

Comment: Chronic obstructive pulmonary disease (COPD) and asthma may exhibit overlapping clinical features. Exhaled breath contains volatile organic compounds (VOCs). The profile of breath VOCs can be assessed by integrative analysis using an electronic nose, providing exhaled breath molecular fingerprints (breathprints), which may discriminate between patients with COPD or asthma. The results from this study showed that molecular profiling of exhaled breath can be used to distinguish between patients with COPD or asthma, and control subjects.
Exhaled breath condensate biomarkers in COPD

Authors: Borrill ZL et al.
URL: http://erj.ersjournals.com/cgi/content/full/32/2/472

Comment: This is a recent comprehensive review article on the clinical usefulness of exhaled breath condensate analysis in COPD patients. Biomarkers of COPD may be useful in aiding diagnosis, defining specific phenotypes of the disease, monitoring exacerbations and evaluating the effects of drugs. Exhaled breath condensate is a non-invasive means of sampling the airways, allowing biomarkers of airway inflammation and oxidative stress to be measured. In this review, the use of exhaled breath condensate biomarkers in COPD is explored, and potential applications in diagnosis, disease phenotyping, monitoring of exacerbations and clinical trials are discussed.

Molecular biomarkers for quantitative and discrete COPD phenotypes

Authors: Bhattacharya S et al.
URL: http://ajrcmb.atsjournals.org/cgi/content/full/40/3/359

Comment: This study showed that distinct expression profiling of RNA derived from lung tissue of COPD patients provides additional insight into potential mechanisms involved in the disease process. In addition, the authors have identified the first gene expression biomarker for COPD, which was validated using an independent data set of quantitative measures of airflow obstruction (FEV₁ % predicted or FEV₁/FVC).

Genome-wide association studies: what do they teach us about asthma and chronic obstructive pulmonary disease?

Author: Boezen HM
URL: http://pats.atsjournals.org/cgi/content/full/6/8/701

Comment: Genome-wide association (GWA) studies have been applied to the identification of the responsible variants and susceptibility genes that are associated with disease. GWA studies may provide characteristic and overlapping profiles of genetic variation associated with asthma and COPD. This article reports that the results of the first three GWA studies on asthma identified ORMDL3, IL1RL1, and PDE4D as susceptibility genes for asthma. The first GWA study on chronic obstructive pulmonary disease (COPD) identified two single nucleotide polymorphisms at the alpha-nicotinic acetylcholine receptor (CHRNA 3/5) locus, which had earlier been identified as a risk factor for both lung cancer and nicotine dependence, as being also associated with COPD. Further studies are needed to clarify the clinical significance of these genetic associations.
Bronchial nitric oxide is related to symptom relief during fluticasone treatment in COPD

Authors: Lehtimäki L et al.
URL: [http://erj.ersjournals.com/cgi/content/full/35/1/72](http://erj.ersjournals.com/cgi/content/full/35/1/72)

Comment: Inhaled corticosteroids (ICS) are the first line therapy for asthma, and use of ICS, or a combination of ICS and long-acting β2 agonists (LABA) is recommended in patients with stage III and stage IV disease with frequent exacerbations. In addition, patients with overlapping asthma and COPD can be treated with ICS or a combination of ICS and LABA, with or without long-acting anti-cholinergic drugs. High levels of exhaled nitric oxide (NO) predict a favourable response to ICS in asthma, but the ability of exhaled NO or inflammatory markers in exhaled breath condensate (EBC) to predict steroid-responsiveness in COPD is not known. This study showed that high levels of bronchial NO flux are related to symptom relief and improvement of airway obstruction during treatment with inhaled fluticasone in patients with COPD.
Predicting corticosteroid response in chronic obstructive pulmonary disease using exhaled nitric oxide

Authors: Dummer JF et al.


URL: http://ajrccm.atsjournals.org/cgi/content/full/180/9/846

Comment: The prediction of corticosteroid response in COPD is important but difficult. A response is more likely to be obtained if there is eosinophilic airway inflammation, for which the fraction of exhaled nitric oxide (FeNO) is a good surrogate marker. This study assessed whether FeNO could predict the efficacy of response to corticosteroid in COPD patients. FeNO was a weak predictor of short-term response to oral corticosteroid in COPD patients, its usefulness being limited to predicting the increase in FEV₁.