



ORIGINAL ARTICLE

Severe obstructive disease: Similarities and differences between smoker and non-smoker patients with COPD and/or bronchiectasis

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Computed
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thorax

Abstract

Introduction: Poorly reversible airflow obstruction may or may not be related to smoking.

Objectives: To describe patients with severe obstructive lung disease including etiology, imaging, functional aspects, systemic manifestations, and the pattern of bronchodilator response.

Methods: Sixty-eight patients (age 55.9 ± 13.7 years, FEV₁ [forced expiratory volume in one second] $31.9 \pm 10.2\%$ predicted) underwent spirometry, evaluation of body mass composition, 6-minute walk test, X-ray, thorax high-resolution CT scanning, and clinical evaluation.

Results: Of 68 patients enrolled, 37 had chronic obstructive pulmonary disease (COPD) and 31, extensive bronchiectasis. Among COPD patients the CT scans showed emphysema in 78.4%, and bronchiectasis in 48.6%. There were no significant differences between smokers and non-smokers, except for vital capacity, significantly smaller in non-smokers ($p < 0.001$). We found 29 and 20 volume responders (VR) according to Paré et al. ($FEV_1/FVC > 1 =$ flow responder or $< 1 =$ VR) and ATS/ERS criteria, respectively. According to Paré et al. criteria, there were 18 patients with FEV₁ $< 30\%$ predicted among 29 VR, and 12 with FEV₁ $< 30\%$ predicted among 39 without volume response ($p = 0.0101$).

Conclusions: In patients with severe obstruction, smoking does not appear to be relevant in determining functional or systemic differences, and Paré et al. criteria can detect more VR. Bronchiectasis is a common finding in severe COPD.

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PALAVRAS-CHAVE

Obstrução das Vias Respiratórias;
Testes de Função Respiratória;
Bronquite;
Bronquiectasia;
Testes de Broncodilatador;
Tomografia de tórax

Doença obstrutiva grave: semelhanças e diferenças entre os pacientes fumadores e não-fumadores com DPOC e/ou bronquiectasia**Resumo**

Introdução: A obstrução das vias respiratórias pouco reversível pode ou não estar relacionada com o tabagismo.

Objetivos: Descrever pacientes com doença pulmonar obstrutiva grave, incluindo etiologia, aspectos dos exames de imagem, parâmetros funcionais, manifestações sistêmicas, e o padrão da resposta ao broncodilatador.

Métodos: Sessenta e oito pacientes (idades de $55,9 \pm 13,7$ anos, FEV₁ [volume expiratório forçado num segundo] $31,9 \pm 10,2\%$ previsto) foram submetidos a espirometria, avaliação da composição de massa corporal, teste de caminhada de 6 minutos, radiografia, tomografia computadorizadas (TAC) de alta resolução do tórax, e avaliação clínica.

Resultados: Dos 68 pacientes inscritos, 37 sofriam de doença pulmonar obstrutiva crônica (DPOC) e 31 de bronquiectasia extensa. Entre os pacientes com DPOC, as tomografias computadorizadas apresentaram enfisema em 78,4% e bronquiectasias em 48,6%. Não existiram diferenças significativas entre os fumadores e os não-fumadores, exceto para a capacidade vital, significativamente inferior nos não-fumadores ($p < 0,001$). Encontramos 29 respondedores de volume (RV) pelos critérios de Paré et al. (VEF₁/CVF > 1= respondedor de fluxo, se > 1 respondedor de volume), e 20 RV pelos critérios da ATS/ERS. De acordo com os critérios de Paré et al., existiam 18 pacientes com FEV₁ < 30% previsto entre os 29 RV, e 12 com FEV₁ < 30% previsto entre os 39 sem resposta a uma prova de volume ($p = 0,0101$).

Conclusões: Em pacientes com obstrução grave, o tabagismo não parece ser relevante na determinação de diferenças funcionais ou sistêmicas, e os critérios de Paré et al. podem detetar mais RV. A bronquiectasia é uma descoberta comum em DPOC grave.

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Introduction

It is quite clear nowadays that the most frequent cause of chronic and progressive airway disease that leads to chronic respiratory failure is Chronic Obstructive Pulmonary Disease (COPD) related to tobacco use. COPD is diagnosed if poorly reversible airflow obstruction can be demonstrated by spirometry and the exposure to noxious gases is present.

Poorly reversible airflow obstruction is not confined to smokers. Kohansal et al.,¹ in a study about the natural history of chronic airflow obstruction, analyzed the Framingham Offspring cohort, who were followed for 23 years. One third of the individuals, who continued to smoke, developed airflow obstruction during follow-up. But so did 7.4% of never-smoker males and 5.6% of never-smoker females.

The classic work of Fletcher et al.² on the natural history of COPD did not include non-smokers and therefore provides no information about the subjects who do not smoke but do have chronic airflow obstruction. In the United States, 20% of the patients who have obstruction in spirometry and 20% of those who die of COPD are non-smokers.³⁻⁶ Few studies have been performed in this group and little is known about its natural history and clinical course.

Mucus hypersecretion, one of the classic features of COPD, is associated with exacerbations and both situations are related to progressive loss of airflow.^{7,8}

On the other hand, patients with hypersecretion unrelated to COPD may present functional and clinical pictures that overlap with chronic bronchitis associated with smoking.⁹

In addition to the symptoms and the spirometric changes, other similarities may exist between COPD and bronchiectasis from various causes: the predominant neutrophilic inflammation,¹⁰ the pattern of response to bronchodilators (BD),¹¹⁻¹³ and the findings on imaging studies.

Having taken this previous data into account we decided to investigate the hypothesis that there are more similarities than differences among patients with severe chronic bronchial disease, regardless of whether they have smoking related COPD or bronchiectasis due to other causes.

Methods

Patients who attended our referral outpatient clinic for chronic respiratory failure and whose spirometry showed a pre-BD FEV₁ < 50% of predicted, and FEV₁/CVF < 70% were invited to participate in this study. We excluded patients with neuromuscular diseases, thoracic deformities, restrictive lung diseases, pulmonary vascular disease and those who had undergone lung resection.

The study was approved by the Ethics Research Committee of our institution and all participants signed an informed consent form.

Clinical data were gathered from patient files. To assess the degree of breathlessness we used the British MRC (Medical Research Council) questionnaire.¹⁴ All patients underwent spirometry before and after the use of formoterol 12 mcg (Foradil®, Novartis, Brazil). Forced vital capacity (FVC) and slow vital capacity (VC) curves were

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