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ORIGINAL ARTICLE

Association of types of dyspnea including 'bendopnea' with cardiopulmonary disease in primary care☆

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Abstract
Introduction: Dyspnea is the symptom most commonly reported by patients with heart failure (HF) and/or pulmonary disease, the obese and the elderly. Recently 'bendopnea' (shortness of breath when bending forward) has been described in patients with HF.
Objective: To determine the association of exertional dyspnea, orthopnea, paroxysmal nocturnal dyspnea and bendopnea with chronic disease, especially heart failure, and their phenotypes in primary care.
Methods: This cross-sectional study included 633 individuals aged between 45 and 99 years enrolled in a primary care program in Niteroi, Brazil. Participants underwent clinical assessment and laboratory tests and completed a questionnaire, all on the same day.
Results: Paroxysmal nocturnal dyspnea and bendopnea were associated with HF (unadjusted OR 2.42, 95% CI 1.10-5.29 and OR 2.59, 95% CI 1.52-4.44, respectively). In multivariate models, chronic obstructive pulmonary disease, coronary heart disease and myocardial infarction were not associated with bendopnea.
Conclusion: Bendopnea was the only type of dyspnea not linked to respiratory disease or coronary heart disease. Even after adjusting for depression and body mass index, the association

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remained with HF with or without preserved ejection fraction, and bendopnea thus appears to be a promising symptom to differentiate HF from the other two disease groups.

PALAVRAS-CHAVE
Insuficiência cardíaca;
Cuidados de saúde primários;
Dispneia;
Dispneia paroxística noturna;
Flexopneia

Associação dos tipos de dispneia e da 'flexopneia' com as patologias cardiopulmonares nos cuidados de saúde primários

Resumo
Introdução: A dispneia é o sintoma mais comummente reportado por pacientes com insuficiência cardíaca, doenças pulmonares, obesos e idosos. Recentemente, a dispneia na anteflexão do tórax — flexopneia — foi descrita entre os pacientes com insuficiência cardíaca.
Objetivo: Estimar a associação da dispneia aos esforços, ortopneia, dispneia paroxística noturna e flexopneia com as doenças crônicas não transmissíveis e, especialmente, com a insuficiência cardíaca e seus fenótipos na atenção primária.
Métodos: Estudo transversal que incluiu 633 indivíduos de 45-99 anos, sorteados entre os cadastrados no programa Médico de Família de Niterói, Brasil. Os participantes foram submetidos a questionário estruturado, avaliação clínica, exames laboratoriais, eletrocardiograma e ecocardiograma, em único dia.
Resultados: A dispneia paroxística noturna e a flexopneia apresentaram associação com a insuficiência cardíaca antes do ajuste (ORb = 2,42; IC 95% = 1,10-5,29 e ORb = 2,59; IC 95% = 1,52-4,44, respectivamente). Nos modelos múltiplos, a doença pulmonar obstrutiva crônica, *angina pectoris* e o infarto do miocárdio não mostraram associação com a flexopneia.
Conclusão: A flexopneia foi a única que não se associou com as doenças respiratórias e as doenças coronarianas. Mesmo após o controle pela depressão e índice de massa corporal, manteve associação com a insuficiência cardíaca e com a insuficiência cardíaca com fração de ejeção preservada, mostrando-se como um sintoma promissor para diferenciar a insuficiência cardíaca dos outros dois grupos de doença.

Introduction

Dyspnea is frequently reported by the elderly, with an estimated prevalence of 20-60%.[1,2] It is the symptom most commonly reported by patients with heart failure (HF),[3,4] although with low specificity, since it is also frequent in prevalent conditions such as chronic obstructive pulmonary disease (COPD), depression, obesity, anemia and coronary artery disease.[2]

The pathophysiology of dyspnea is complex, with various etiologies and mechanisms.[5–8] Among the different types of dyspnea, the most common are exertional dyspnea, paroxysmal nocturnal dyspnea (PND) and orthopnea.[9–11] A new type has recently been described in patients with HF: 'bendopnea' (shortness of breath when bending forward),[12] which is associated with an increase in echocardiographic indices of left-sided filling pressures.[13]

The aim of the present study was to determine the association of exertional dyspnea, orthopnea, PND and bendopnea with chronic disease, especially HF, and their phenotypes in primary care.

Methods

This cross-sectional study is part of the DIGITALIS study and included 633 individuals aged between 45 and 99 years enrolled in a primary care program in Niteroi, Rio de Janeiro state, Brazil. The individuals invited to participate were selected according to previously established methods to be representative of the population under study. Data were collected between July 2011 and December 2012. Selected individuals were seen at their nearest health center, where they completed a questionnaire and underwent a clinical, anthropometric and nutritional assessment, blood pressure (BP) measurement, electrocardiogram and echocardiogram, and blood and urine samples were collected for laboratory tests, all on the same day. The study design and the results of the main study have been previously published.[14]

BP was measured using an Omron HEM-711 HC14 monitor, three measurements being taken at 1-min intervals with the subject seated and arm supported at the level of the heart. If the difference between any measurements was greater than