Arch Bronconeumol. 2010;**46(10)**:522-530

ARCHIVOS DE BRONCONEUMOLOGIA

www.archbronconeumol.org

Original Article

Geographical Variations in the Prevalence of COPD in Spain: Relationship to Smoking, Death Rates and other Determining Factors

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ARTICLE INFO

Article history:
Received April 20, 2010
Accepted June 16, 2010

Keywords:
EPI-SCAN
COPD
Spain
Smoking
Variation

ABSTRACT

Background: The EPI-SCAN study (Epidemiologic Study of COPD in Spain), conducted from May 2006 to July 2007, determined that the prevalence of COPD in Spain according to the GOLD criteria was 10.2% of the 40 to 80 years population. Little is known about the current geographical variation of COPD in Spain.
Objectives: We studied the prevalence of COPD, its under-diagnosis and under-treatment, smoking and mortality in the eleven areas participating in EPI-SCAN. COPD was defined as a post-bronchodilator FEV_1/FVC ratio <0.70 or as the lower limit of normal (LLN).
Results: The ratio of prevalences of COPD among the EPI-SCAN areas was 2.7-fold, with a peak in Asturias (16.9%) and a minimum in Burgos (6.2 %) (P<.05). The prevalence of COPD according to LLN was 5.6% (95% CI 4.9-6.4) and the ratio of COPD prevalence using LLN was 3.1-fold, but with a peak in Madrid-La Princesa (10.1%) and a minimum in Burgos (3.2%) (P<.05). The ranking of prevalences of COPD was not maintained in both sexes or age groups in each area. Variations in under-diagnosis (58.6% to 72.8%) and under-treatment by areas (24.1% to 72.5%) were substantial (P<.05). The prevalence of smokers and former smokers, and cumulative exposure as measured by pack-years, and the age structure of each of the areas did not explain much of the variability by geographic areas. Nor is there any relation with mortality rates published by Autonomous Communities.
Conclusion: There are significant variations in the distribution of COPD in Spain, either in prevalence or in under-diagnosis and under-treatment.

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0300-2896/$ - see front matter

Diferencias geográficas en la prevalencia de EPOC en España: relación con hábito tabáquico, tasas de mortalidad y otros determinantes

Palabras clave:
EPI-SCAN
EPOC
España
Tabaquismo
Variabilidad

RESUMEN

Antecedentes: El estudio EPI-SCAN (Epidemiologic Study of COPD in Spain), realizado entre mayo de 2006 y julio de 2007, ha determinado que la prevalencia de la EPOC en España según los criterios GOLD es del 10,2% (IC 95% 9,2-11,1) de la población de 40 a 80 años. Se desconoce la variabilidad geográfica actual de la EPOC en España.

Objetivos: Describir la prevalencia de EPOC, su infradiagnóstico e infratratamiento, y los datos de tabaquismo y mortalidad en las once áreas participantes en el estudio EPI-SCAN. Se definió EPOC como un cociente FEV_1/FVC posbroncodilatador < 0,70 o menor del límite inferior de la normalidad (LIN).

Resultados: La razón de prevalencias de EPOC según criterios GOLD entre áreas fue de 2,7 veces, con un máximo en Asturias (16,9%) y un mínimo en Burgos (6,2%) (p < 0,05). La prevalencia de EPOC según el LIN fue del 5,6% (IC 95% 4,9-6,4) y la razón de prevalencias utilizando el LIN fue de 3,1 veces, pero con un máximo en Madrid-La Princesa (10,1%) y un mínimo en Burgos (3,2%) (p < 0,05). El orden de prevalencias de EPOC por áreas no se mantuvo en ambos sexos ni por edades en cada área. Las variaciones en infradiagnóstico (58,6% a 72,8%) e infratratamiento por áreas (24,1% a 72,5%) fueron sustanciales (p < 0,05). La prevalencia de fumadores y ex-fumadores, y la exposición acumulada medida por paquetes-año, así como la estructura de edad de cada una de las áreas, no explican la variabilidad por áreas geográficas. Tampoco existe relación con las tasas de mortalidad publicadas por comunidad autónoma.

Conclusión: Existen importantes variaciones en la distribución de la EPOC en España, tanto en prevalencia como en infradiagnóstico e infratratamiento.

Introduction

The latest report by the World Health Organization on the situation of smoking in the world shows that Spain, with 44.5 million inhabitants, 26% of whom are regular smokers and 3% occasional smokers, is still in phase III of the smoking epidemic curve.[1] A decrease has been observed among male smokers but numbers remain steady among women, still a long way off the phase IV of the population of Western Europe. Monitoring chronic diseases related to tobacco use is a relevant, current issue. Preliminary data from December 2009 from the European Health Survey show a surprising increase in smoking among adults in Spain, reaching 31.5% at the present time.[2]

The EPI-SCAN study determined that the current prevalence of COPD in Spain according to the GOLD criteria is 10.2% (95% CI, 9.2-11.1) of the 40 to 80 years population.[3] Previously, the IBERPOC study in 1997 determined a prevalence of COPD of 9.1% (14.3% in men and 3.9% in women), with important differences between the 7 participating areas.[4] COPD is defined according to the former criteria of the European Respiratory Society as a post-bronchodilator FEV_1/FVC ratio <88% of the predicted value in men and 89% in women. On this subject, the high number of cases detected in some geographical areas in the IBERPOC study corresponded with female non-smokers over 55 years with a history of childhood respiratory diseases who suffered no symptoms of expectoration or wheezing.[5]

The comparison of the spirometry results in the IBERPOC and EPI-SCAN studies have been described recently.[6] However, the geographical variations in COPD in Spain at present are unknown, as are its relationship with smoking and other local determining factors. The so-called geographical or small area epidemiology[7] encourages the local dissemination of health data compared with surrounding towns, which makes it possible to establish priorities for carrying out correction mechanisms, as recently reviewed.[8] Furthermore, it should make it possible to monitor and/or confirm that community strategy recommendations are being implemented.[9] Internationally, both the PLATINO and BOLD initiatives identified important differences in the distribution of the prevalence of COPD,[10,11] although in both studies the samples were from one single city or area per country, so it is not possible to determine the variability within the country or in small areas. The aim of this article is to determine if there are variations in the prevalence, underdiagnosis and under-treatment of COPD among the 11 areas participating in the EPI-SCAN, and to analyze if these variations are related to some of its determining factors, including smoking on an individual level and the COPD official mortality rates published by the autonomous communities at an ecological level.

Method

The methodology and protocol of the EPI-SCAN study have been described previously in detail.[12] Briefly, the EPI-SCAN is population-based, multi-centred, cross-sectional, observational, epidemiologic study carried out on national scale with a randomized selection of participants using two-stage sampling, stratified by areas close to the participating centres. The participating centres were selected in accordance with four geographical areas (north, east, south and centre) in Spain, which are: Barcelona, Burgos, Cordoba, Huesca, Madrid (two centres), Oviedo, Seville, Valencia, Vic and Vigo. Two-stage, population-based, randomized sampling was performed using telephone sampling and including men and women in the general population aged between 40 and 80 years and resident in Spain. The field work was performed between May 2006 and July 2007. The study was authorized and presented by the corresponding ethics committees for clinical research, the Clinic i Provincial Hospital in Barcelona being the reference committee. All the participants gave their voluntary written consent to participate in the trials.

Information was collected about sociodemographic data, smoking habits, previous diagnosis of respiratory diseases and other pathologies, COPD exacerbations, dyspnoea scale, and treatment for respiratory diseases, amongst other variables. The presence of respiratory symptoms (daily morning cough, frequent sputum, and the presence at some time of dyspnoea and wheezing) was collected using the Spanish version of the CECA questionnaire.[13] Forced spirometry was carried out with MasterScope CT (VIASY Healthcare®, Hoechberg, Germany, using the acceptability and reproducibility criteria and the selection of manoeuvre proposed in the most recent recommendations of the American Thoracic Society/European Respiratory Society (ATS/ERS),[14] the reference values of the CECA were used.[15] The manoeuvres were repeated 15-30 min after inhaling 200 mcg of salbutamol. Following the criteria of the ATS/ERS