The Factors Influencing Relapse in Patients Presenting to the Emergency Department with COPD Exacerbation

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SUMMARY

Objectives

Chronic Obstructive Pulmonary Disease (COPD) is associated with high mortality and morbidity and is projected to be the third most common cause of death worldwide by 2020. For a variety of reasons, there is a drive to manage a greater number of individuals as outpatients. Preventing readmissions can reduce associated morbidity and subsequent healthcare costs.

Methods

The aim of the present study was to determine the factors affecting the relapse of COPD exacerbated patients in the emergency department (ED). This study combines data from two prospective cohort studies. Patients included in the study were above 18 years of age, had a previous diagnosis of COPD, and presented to the ED for the treatment of acute exacerbation. All the information relevant to the study was collected during the patient's visit to the ED. Relapse was defined as an unscheduled visit to an ED or primary physician within 2 weeks of initial ED visit for worsening COPD symptoms. Telephone follow-up was done on all patients at the end of 2 weeks.

Results

The cohort consists of 196 patients. Relapse rate in this study was 27%. Mean respiratory rate, exacerbations in previous year, home nebulizator therapy, home oxygen therapy, admission to intensive care or hospital ward due to COPD exacerbation, previous intubation and abnormal chest x-ray were associated with increased re-visit in univariate analysis. However, after multivariate analysis, exacerbations in previous year (OR: 1.08, 95%CI: 1.01–1.15) and abnormal chest X-ray (OR: 2.5, 95%CI: 1.10–6.11) were still significant.

Conclusions

In conclusion, the number of ED visits previous year and abnormal chest x-ray can predict the revisit of a COPD exacerbated patient within 14 days of an ED visit.

Key words: Emergency medicine; COPD; relapse.

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a chronic disorder characterized by irreversible airway obstruction and is an important problem of public health. COPD mainly occurs due to cigarette smoking, environmental and occupational exposure. This is a costly disease due to frequent exacerbations in addition to being a major cause of mortality and morbidity.[1] Exacerbation of COPD is one of the most

common reasons for presenting to emergency departments (ED). Some of those patients repeatedly present to EDs with continuing complaints. Medical doctors have restricted parameters concerning which patient will present to hospital with unending complaints and increasing dyspnea. Although it has been reported in various studies that the patients would be presenting to hospital again in case of frequent hospital visit within previous year and increasing dyspnea, there are not any objective parameters.[2]

The present study is designed to research the factors influencing relapse in patients diagnosed with COPD and presenting to the emergency department with exacerbation.

Materials and Methods

This prospective cross sectional and clinical study was conducted through the data collected during two separate time periods in Akdeniz University, Faculty of Medicine Hospital, Emergency Department between November 2007-May 2008 and December 2011-July 2012. The study included the patients over 18, presenting to ED with COPD acute attack and who were later discharged. Exacerbation of COPD as an acute event was considered as defined in GOLD 2013 guidelines 'a worsening of the patient's respiratory symptoms thait is beyond normal day-to-day variations and leads to a change in medication'.[3] The patients with the suspicion of active pulmonary tuberculosis, with cystic fibrosis diagnosis, with a diagnosed bronchiectasis history, and with lung cancer were excluded from the study.

The form used in the study included the following information: age, gender, date of presenting, cigarette use (past smoker, still smoker, non-smoker), vital findings upon arrival and departure from ED (blood pressure, oxygen saturation, respiratory rate, pulse wave velocity, temperature), whether arterial blood gas (ABG) values are abnormal or not (pH<7.35 or PaO_2>60 mmHg or PCO_2>45 mmHg accepted as abnormal), co-morbid conditions (Hypertension, Diabetes Mellitus, Coronary Heart Disease, Congestive Heart Failure, Chronic Renal Failure, Chronic Liver Disease), oxygen and nebulizer therapy receiving at home or not, history of hospitalization or intensive care requirements, having been intubated or not, systemic steroid use, number of presenting to ED during the last one year, body mass index, chest radiography abnormality (previous or recent changes in chest radiography accepted as abnormal), treatment in ED (ß2 mimetic, ipratropium bromide, steroid and dose), presence of Anthonisen criteria, possible factor inducing exacerbation (infection, wrong drug use), discharge with an unknown reason or pre-hospitalization treatment (antibiotic treatment, steroid treatment), discharge/hospitalization status, telephone numbers.

Anthonisen criteria are a classification used for the severity of COPD exacerbation. Those criteria are divided into two as major and minor. Increased dyspnea, increased sputum volume, and increased sputum purulence are considered as major criteria. Minor criteria are the presence of an upper respiratory tract infection in the past 5 days, fever without any other apparent cause, increased cough or wheezing. Type I have all three major criteria, and Type II exhibit two major criteria, Type III exacerbations (mild) have one major criterion plus one of the minor criteria.

The patients discharged from ED were called back after 15 days and were inquired whether they had visited any health institution with the same complaints and their responses were recorded.

First group data of the study were published in 'European Journal of Emergency Medicine' in 2010 and approval for re-use of some of the data was received from the concerning journal.[2] Also, approval from Faculty of Medicine Research Ethics Committee was obtained for the second group data.

Statistical Analysis

Statistical analyses were performed with SPSS Statistics version 16.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were presented as mean ± standard deviation; for non-normally distributed variables, median values and inter-quartile range were given; variable frequencies were stated as percentage. Normality distribution of variables was examined via both visual (histogram and probabilistic graphs) and analytic methods (Kolmogorov-Smirnov). In order for group comparison, Student t-test for normally distributed variables, Mann-Whitney U test for non-normally distributed variables, and χ^2 (Chi-square) tests for categorical variables were performed. In multivariate analysis, logistic regression analysis was performed by employing probable factors determined in previous analyses. The conditions of type I error level under 5% were accepted as statistically significant.

Results

The present study evaluated 196 patients. Development of relapse were observed in 54 (27%) of the patients. The study group consisted of 92 (47%) males, 104 (53%) females with a mean age of 67±10. Demographic details of the patients were displayed in Table 1.

Arterial blood gas values were normal in 107 (55%) and abnormal in 65 (34%) of the patients while in 24 (11%) of the patients arterial blood gas measurement was not demanded. As a result of co-morbid disease evaluation; it was established that of the patients 84 (43%) were with hypertension, 35 (18%) with diabetes mellitus, 41(%21) with coronary