

# THE IMPACT OF DYSPNEA AND PHYSICIAN-BASED DIAGNOSIS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE ON SMOKING CESSATION BEHAVIOR

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## ABSTRACT

**Objective:** We aimed to study whether dyspnea or diagnosis of chronic obstructive pulmonary disease (COPD) can affect smoking status, smoking cessation behavior and severity of disease.

**Material and Method:** In this cross-sectional study, 150 patients with COPD were included. We asked the patients the time they had a dyspnea and the time their disease diagnosed by physician. Reversible airway obstruction, and comorbid diseases that affect respiratory function and patients refused to participate excluded.

**Results:** According to GOLD criteria, 61 patients (40.7%) were stage 2, 63 (42%) were stage 3 and 26 (17.3%) were stage 4. The mean ( $\pm$ SD) age was  $61\pm 9$  years and 140 were men. The mean forced expiratory volume 1 (FEV1) was  $45\pm 16\%$  and smoking history was  $48\pm 21$  pack/year. Thirty-five (23.3%) patients had stopped smoking before the onset

of dyspnea. Twenty patients (13.3%) had stopped smoking between the onset of dyspnea and COPD diagnosis. Ninety-five (63.3%) of the patients continued to smoke despite they had dyspnea. Nineteen (12.7%) patients stopped smoking in the first month after COPD diagnosis (Early Quitters). Remaining 18 (12%) patients stopped smoking more than a month of COPD diagnosis (Late Quitters). The time between dyspnea and COPD diagnosis (DDtime) was  $3.6\pm 4$  years. DDtime was negatively correlated with FEV1 % value ( $r=-0.161$ ,  $p<0.05$ ).

**Conclusion:** As a result of our study, we detected negative correlation between DDtime and FEV1 (%). Diagnosis of COPD can affect smoking cessation behavior and this critical time should be supported with effective cessation programs in order to improve disease outcome.

**Key Words:** Pulmonary disease, chronic obstructive pulmonary disease, dyspnea, diagnosis, smoking cessation  
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## KRONİK OBSTRÜKTİF AKCİĞER HASTALIĞI HASTALARINDA DOKTOR TARAFINDAN KONULAN TANI VE DISPNE VARLIĞININ SİGARA BIRAKMA DAVRANIŞI ÜZERİNE ETKİSİ

### ÖZET

**Amaç:** Çalışmamızda kronik obstrüktif akciğer hastalığı (KOA) tanısı veya dispne varlığının, KOAH hastalarında sigara içme durumu, sigarayı bırakma davranışı ve hastalık ağırlığı üzerine etkisini araştırmak amaçlandı.

**Materyal ve Metod:** Bu kesitsel çalışmaya 150 KOAH hastası alındı. Hastalara dispne şikayetlerinin ne zaman başladığı ve doktor tarafından hastalık tanılarının ne zaman konulduğu soruldu. Geri dönüşlü havayolu obstrüksiyonu, solunum fonksiyonlarını etkileyecek komorbid hastalıklar ve çalışmaya katılmayı reddetme dışlanma kriterleri olarak alındı.

**Bulgular:** GOLD'a göre hastaların 61'i (%40,7) 2. evre 63'ü (%42) 3. evre ve 26'sı (%17,3) 4. evre idi. Ortala-

ma (SD) yaş  $61\pm9$  yıl ve 140 olgu erkek idi. Ortalama FEV1  $\%45\pm16$  ve sigara içme öyküsü  $48\pm21$  paket/yıl idi. Hastaların %37'si KOAH tanısı konmadan önce sigarayı bırakmıştı. Doksan beş hasta (%63) dispne şikayetleri olmasına rağmen sigara içmeyi sürdürmüştü. On dokuz hasta (%12,7) KOAH tanısından sonraki 1 ay içinde sigarayı bırakmıştı. Hastaların 18'i (%12) tanıdan 1 ay sonra sigarayı bırakmıştı. Dispnenin başlamasından KOAH tanısı konmasına kadar geçen zaman (DD zamanı)  $3,6\pm4$  yıl idi. DD zaman ile yüzde FEV1 değeri arasında negatif korelasyon saptadık ( $r=-0,161$ ,  $p<0,05$ ).

**Sonuç:** Çalışmanın sonucunda DD zamanı ile FEV1 (%) arasında ters yönlü ilişki saptanmıştır. KOAH tanısının konulması sigara bırakma davranışını etkileyebilir ve bu kritik zaman etkin sigara bırakma programları ile desteklenirse hastalığın sonuçları üzerine olumlu etkisi olabilir.

**Anahtar Kelimeler:** Akciğer hastalığı, kronik obstrüktif akciğer hastalığı, dispne, tanı, sigara bırakma Nobel Med 2013; 9(3): 69-73

### INTRODUCTION

The prevalence of chronic obstructive pulmonary disease (COPD) is estimated to be between 4-10% in adults which is an underdiagnosed cause of morbidity and mortality in the world.<sup>1-4</sup> Previous studies underdiagnosis most frequently involves asymptomatic patients at early stages of COPD among primary care.<sup>5-8</sup>

Smoking is the leading risk factor for COPD. Smoking cessation is the only proven way of changing the natural course of COPD. In this study we aimed to investigate whether symptoms related to COPD or diagnosis of the disease could affect smoking status. In addition we searched an association between severity of disease and DDtime (the time between dypnea and physician-based diagnosis).

### MATERIAL and METHOD

**Design:** Hospital-based cross-sectional study. Data were obtained from patient questionnaires.

**Patients:** The study was carried out at Yedikule Chest Disease and Thoracic Surgery Training Hospital in 2011. We included 198 adult COPD patients as an outpatient settings. Forty-eight patients were excluded from the study due to; 1) refusal of participation in the study (20 patients), 2) comorbid diseases affecting respiratory functions (24 patients), 3) stage 1 (FEV<sub>1</sub>>80%) disease (four patients). Therefore the study included 150 patients

(140 men, 10 women) in the pulmonary department. All participants were informed and gave their formal consent. Patients 40 year of age or older were eligible if they had; 1) smoking history of at least 10 pack years, 2) postbronchodilator FEV1 <%80, 3) Forced expiratory volume 1 / Forced vital capacity (FEV1/FVC) <%70. We defined COPD as a postbronchodilator FEV1/FVC ratio of less than 70% and FEV1 of less than 80% predicted (GOLD stage 2 or higher) according to GOLD.<sup>9</sup>

**Measures:** Patients answered eight questions including age, gender, smoking status, smoking p/ years, the time onset of dyspnea, the time diagnosis of COPD by physician, the time of cessation of smoking and comorbidities.

The term of "quit smoking" has been used for the patients stopped smoking at least for six months. If patient has been quitted smoking less than one month following COPD diagnoses have been assessed as "early quitters-EQ". The patients has been quitted smoking more than a month of COPD diagnosis have been termed as "late quitters- LQ".

Spirometry was performed using a SensorMedics model 2400; SensorMedics; Yorba Linda, CA. Results were given as percentage of the predicted values calculated from the reference values reported by European Community for Coal and Steel. Spirometry was performed in accordance with the recommendations of the American Thoracic Society.<sup>10</sup>→

## Statistical Analysis

Statistical analyses were performed by SPSS 11.5 package programme (SPSS Inc. Chicago, IL, USA). Categorized data were analyzed by Pearson Chi Square and Fisher's Exact tests and numeric data were analyzed by Student's t test. Spearman Correlation test was used to obtain the effective and correlated parameters. Data are expressed as mean±SD, with significance level  $p < 0.05$ .

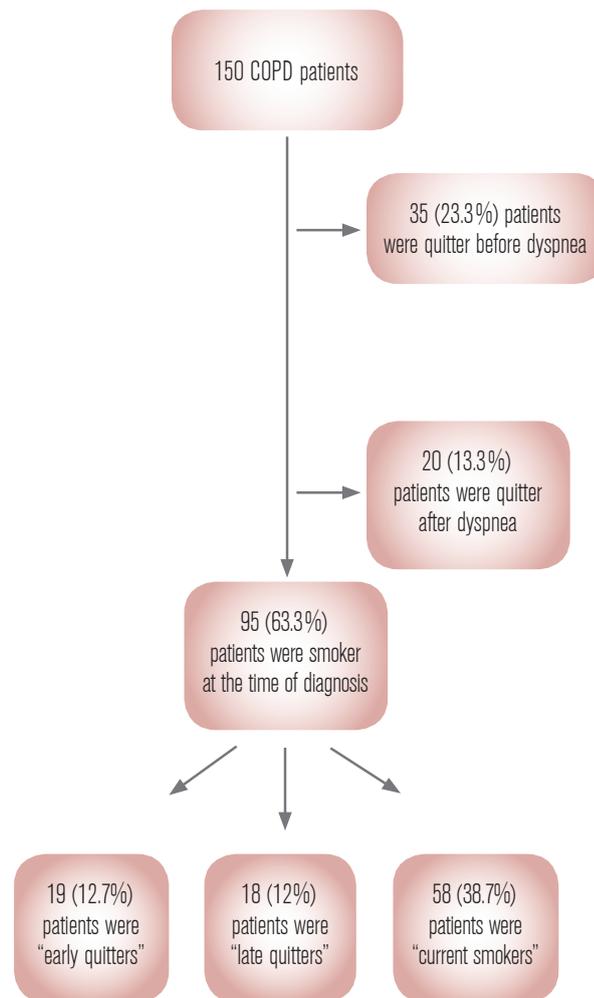
## RESULTS

A hundred and fifty COPD patients with 140 male and 10 female were included in the study. The mean age was  $61 \pm 9$  years. According to Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria, 61 patients (40.7%) were stage 2, 63 (42%) were stage 3 and 26 (17.3%) were stage 4, by post-bronchodilator FEV1. The mean FEV1 were  $45 \pm 16\%$  of the predicted value and the average number of pack years was 48. Fifty eight patients (39%) had a comorbidities, 92 patients (61%) did not have any other disease. Demographical features were given in Table 1.

The mean time from diagnosis of COPD was  $4 \pm 6.5$  years. In addition, the mean time of the duration of dyspnea was  $7.2 \pm 6.5$  years. Only 26 patients (17%) was diagnosed as COPD immediately when they had dyspnea. The time between dyspnea and COPD diagnosis (DDtime) was  $3.6 \pm 4$  years.

There was a correlation between the severity of the disease and duration of dyspnea ( $r = 0.23$ ,  $p < 0.01$ ) and duration of the COPD diagnosis ( $r = 0.191$ ,  $p < 0.05$ ). There was a negative correlation between FEV1 and the duration of dyspnea ( $r = -0.261$ ,  $p < 0.01$ ), DDtime ( $r = -0.161$ ,  $p < 0.05$ ) and the duration of the COPD diagnosis ( $r = -0.19$ ,  $p < 0.05$ ). No association was detected between severity of disease and comorbidities ( $p > 0.05$ ).

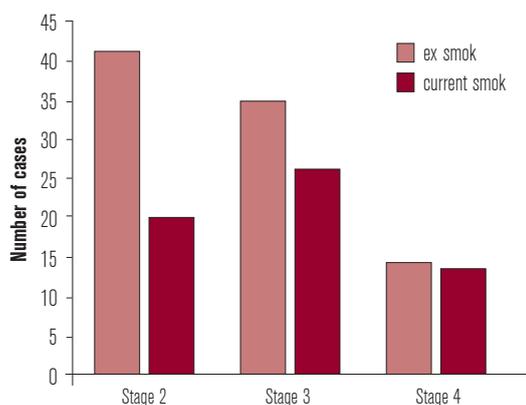
Thirty five (23.3%) patients stopped smoking before the onset of dyspnea. Twenty patients (13.3%) had stopped smoking between the onset of dyspnea and physician based COPD diagnosis. Ninety five (63.3%) of the patients continue to smoke despite they have dyspnea. Nineteen (12.7%) patients had stopped smoking in the first month after COPD diagnosis (EQ). Remaining 18 (12%) patients stopped smoking more than a month of COPD diagnosis (LQ). Therefore, 92 (61%) patients were ex-smokers, whereas 58 (39%) patients were current smokers at the study. The effect of the dyspnea and diagnosis of COPD on the rate of the smoking cessation was given in Figure 1. Sixty seven percent (41/61) of stage 2 patients, 59% (37/63)



**Figure 1.** The impact of dyspnea and diagnosis of disease on the rate of smoking cessation has been shown in the flow chart.

| Table 1: Demographic features of patients (n=150) |     |      |
|---|-----|------|
|   | n   | (%)  |
| <b>Sex</b>  |     |      |
| Male  | 10  | 93.3 |
| Female  | 140 | 6.7  |
| <b>Smoking status</b>                             |     |      |
| Ex-smoker   | 91  | 60.7 |
| Current smoker                                    | 59  | 39.3 |
| <b>Quitters after diagnosis</b>                   |     |      |
| Early quitters                                    | 19  | 12.7 |
| Late quitters                                     | 18  | 12   |
| <b>Comorbid disease</b>                           | 58  | 38.7 |
| <b>Severity</b>                                   |     |      |
| Stage 2   | 61  | 40.7 |
| Stage 3   | 65  | 42   |
| Stage 4   | 26  | 17.3 |

of stage 3 patients, 50% (13/26) of stage 4 patients had stopped smoking. The reduction in the rate of smoking cessation is associated with more advanced disease, but the difference was not statistically significant ( $p > 0.05$ ). Smoking status according to the stage of COPD was given in Figure 2. →



**Figure 2:** Smoking status according to the stage of COPD. The reduction in the rate of smoking cessation is associated with more advanced disease, but the difference was not statistically significant ( $p>0.05$ ).

## DISCUSSION

Although COPD is one of the most important diseases in the world causing morbidity and mortality, it still remains as an underdiagnosed disease.<sup>3,11</sup> In this cross-sectional study we determined that only 17% of the patients having COPD were diagnosed while dyspnea began, the remaining was diagnosed approximately  $3.6\pm 4$  years after onset of dyspnea. A negative correlation between the DDtime and FEV1 value was observed. Additionally, we observed that 63% of patients kept smoking despite dyspnea. In these patients, cigarette cessation rate was 39% after the diagnosis COPD.

Potentially, COPD is preventable disease. Smoking cessation is the most effective means of preventing or decreasing the progression of COPD. Previous studies reported that diagnosis of COPD, as documented by abnormal spirometry findings, would increase the smoking cessation rate in persistent smokers.<sup>12-14</sup> Gorecka et al. followed up cases with age over 40 years, smoking at least 10 pack/year with periodical spirometry for one year. They gave the same support to all cases for cessation of smoking. In patients with airway obstruction, who were informed about their disease, the rate of cessation was 15%. Whereas, in cases with normal lung functions, this rate was determined to be 4.5%.<sup>14</sup>

In our study, 12.7% of patients who were continue to smoke despite dyspnea, cessation has been achieved in the first month after diagnosis of COPD without any other effort. Even in the studies used cessation therapies, the highest cessation rates in COPD patients were found to be approximately 35% and this rate was reported to be decreased to 22% for long time follow up.<sup>15,16</sup> Thus, a 12.7% of cessation rate just because of the diagnosis of COPD in our study seems to be important.

In this study, we observed decreased rates of cigarette cessation in patients with advanced stage of disease. Sixty seven percent of stage 2 patients, 59% of stage 3 patients and 50% of stage 4 patients stopped smoking. There are conflicting results in the literature for about relationships between cessation ratio and severity of disease. Taskhin et al. reported higher rates of success for quitting in stage 1 COPD patients compared to stage 2 patients in a double blind, placebo controlled, randomized study as a similar of our results.<sup>16</sup> This may be attributed to increased frequency of depression and also higher levels of smoking addiction in patients with advanced stage disease. Conversely, Gorecka et al. showed that higher cessation rates were observed in smokers with moderate and severe airflow obstruction, compared to smokers with mild obstruction.<sup>14</sup>

It could be assumed that COPD patients with comorbidities could be examined by a doctor more frequently and a diagnosis of COPD might be earlier. However, we did not find a correlation between the presence of a comorbidity and the DDtime in our study. This might be related with our government health policy, inefficient education or less time spending to the patients by general practitioners. On the other hand, Zwar et al. analyzed predictors of accuracy of diagnosis in COPD patients. They indicated comorbidities can cause inaccurate diagnosis and misdiagnosis.<sup>17</sup>

To increase the awareness of COPD among doctors and general population is extremely important for the early diagnosis of COPD and thereby for the increase rate of smoking cessation. In a population-based cross-sectional study, it was detected that nearly half of the smokers had stopped smoking after the myocardial infarction.<sup>18</sup> Thus, positive effect of acute cardiovascular events on smoking cessation has been shown before.<sup>18,19</sup> It is important to show that the new diagnosis of COPD as a chronic disease could be impact on the achievement of smoking cessation programs.

There were some limitations in our study. First of all, it was a study based on the history given by the patients rather than the physician document. There might be some fallibility related to the patients' answers. To minimize it, we excluded patients who could not give a complete or exact answer, or age  $>75$ . The second limitation was the absence of medical records showing how many times and for which reasons they visited a doctor during the time period until diagnosis. Thereby, delayed diagnosis related to the medical care could not be investigated in our study. →

## CONCLUSION

As a result of our study, we detected negative correlation between DDtime and FEV1. It can be concluded that delayed diagnosis could be associated with more severe disease. Additionally, the positive

effect of the diagnosis of COPD as a chronic illness on quit smoking. Early diagnosis of disease might facilitate motivation of patients to quit smoking when assisted with more comprehensive smoking cessation programs in these particularly vulnerable period of time for better outcome in COPD.



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