

## ORIGINAL ARTICLE

# Relationship between incidence of chronic obstructive pulmonary disease and lung cancer as comorbidity in primary health care in two Belgrade communities

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## Summary

**Purpose:** To investigate the recent trends in the incidence of chronic obstructive pulmonary disease (COPD) and lung cancer as comorbidity in primary health care (Community Health Center, Zemun, Belgrade, which covers two municipalities - Surchin and Zemun), during the period 2014-2017.

**Methods:** This retrospective study analyzed the incidence of COPD and lung cancer as comorbidity in a 4-year period. Data were derived from the Heliant information system. Descriptive statistics -frequencies and percentages- were used, and differences between groups were tested by  $\chi^2$  test.

**Results:** The number of patients with COPD was slightly, but insignificantly, higher each consecutive year. Lung cancer as comorbidity appeared in about 11% of these patients. As for gender, male and female patients contributed equally to the number of patients with COPD.

**Conclusion:** The number of patients with COPD registered in primary health care was similar in all investigated years. Lung cancer as comorbidity was found in a significantly smaller number of these patients.

**Key words:** chronic obstructive pulmonary disease, lung cancer, primary health care

## Introduction

Lung cancer and chronic obstructive pulmonary disease (COPD) are the two most common fatal pulmonary disorders. It was shown repeatedly that patients with COPD are at increased risk of developing primary lung cancer [1]. The overall prognosis for patients with COPD and lung cancer is worse than that of patients with lung cancer without COPD [2]. The annual incidence rates of lung cancer per 10,000 person-years are at least 4-fold higher in patients with prior COPD compared with the general population [2].

The association between COPD and lung cancer has been reported in numerous studies, and

among several risk factors, smoking seems to be the most important. The risk of lung cancer in patients with COPD is 2.5-fold greater compared to smokers without COPD [3,4]. In the past, men prevailed over women regarding the incidence of COPD and lung cancer, which was explained by the fact that women were much less represented in the smoking population. However, in many countries, including Serbia, the percents of men and women smokers are now almost even.

The relationship between the incidence of COPD and lung cancer in primary health care has been investigated to a much lesser extent [2]. In

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this article we present the incidence of COPD and the contribution of lung cancer in patients with COPD in primary health care in two Belgrade regions during a 4-year period. The distribution of the 2 genders was also investigated.

## Methods

We determined the recent trends in the incidence of lung cancer and COPD in primary health care patients (Community Health Center, Zemun, Belgrade, which covers two municipalities - Surchin- rural, and Zemun-urban) during the period 2014-2017. Data were derived from the Heliant information system. All patients were diagnosed with COPD and lung cancer as comorbidity.

## Results

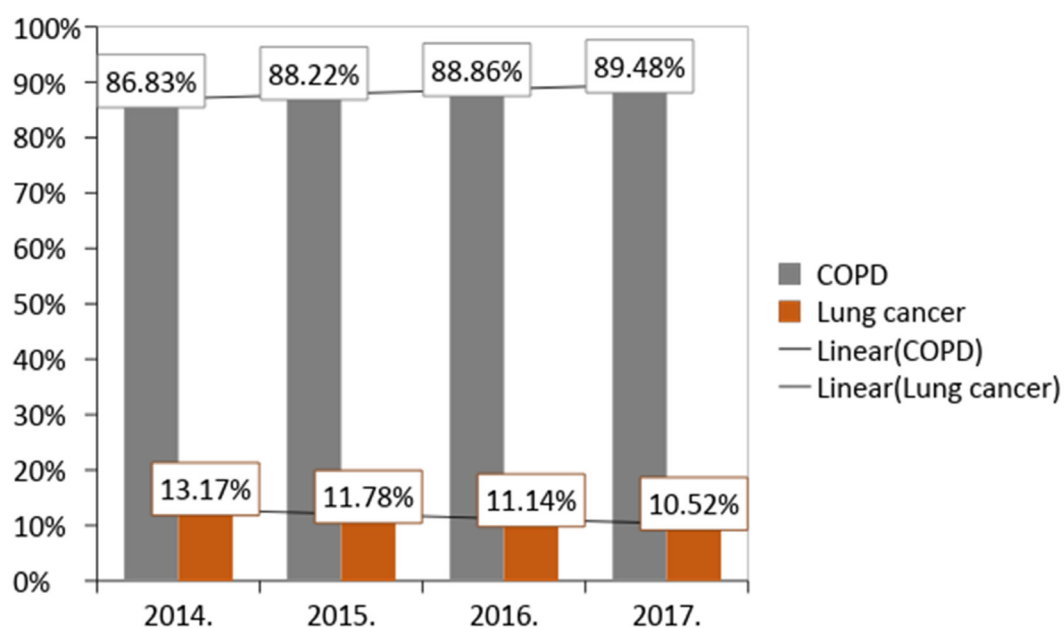
A similar number of male and female patients with COPD was registered in each investigated year (Table 1). A total of 13259 patients with COPD (mean 3314) were registered in the investigated periods 2014, 2015, 2016 and 2017 (3071, 3242, 3383, and 3563, respectively). In the same period, 1742 of them had lung cancer as comorbidity. The percentages of patients with COPD and lung cancer (about 11%) remained approximately the same during the investigated period. Approximately the same number of patients with COPD and lung cancer were registered each year. Significantly higher

**Table 1.** Distribution of COBP patients according to gender

Year	Male n (%)	Female n (%)	Total n (%)	p
2014	1530 (49.82)	1541 (50.18)	3071 (100)	>0.05
2015	1583 (48.83)	1659 (51.17)	3242 (100)	>0.05
2016	1484 (43.87)	1899 (56.13)	3383 (100)	>0.05
2017	1743 (48.92)	1820 (51.08)	3563 (100)	>0.05

**Table 2.** Annual number of patients with COPD and lung cancer in the period 2014-2017

Year	COPD n (%)	Lung cancer n (%)	Total n (%)
2014	3071 (86.83)	466 (13.17)	3537 (100)
2015	3242 (88.22)	433 (11.78)	3675 (100)
2016	3383 (88.86)	424 (11.14)	3807 (100)
2017	3563 (89.48)	419 (10.52)	3982 (100)



**Figure 1.** Percentage of patients with COPD and lung cancer in the period 2014-2017.

number of patients with COPD alone than those with lung cancer as comorbidity was seen (Table 2, Figure 1).

## Discussion

As a primary health care organization, the Community Health Center Zemun, Belgrade, provides health services for the inhabitants of the territories of Zemun and Surchin. Such a vast area makes the providing of health services rather difficult. For example, the most distant Health Station is 41 km far-off from the Central Primary Health Care Center.

Both territories have 214938 inhabitants, of which 173670 are 19 years old and over. The population is a mix of urban and rural people, differing regarding socioeconomic status, high rate of unemployment, low level of health culture and education. Therefore, all risk factors for COPD and lung cancer are present.

Our results showed that in the region investigated during a 4-year period, a constant number of patients with either COPD or lung cancer was registered in primary care. The number of patients with COPD was several times higher than that of patients with concurrent lung cancer.

The association between lung cancer and COPD has been rarely investigated in the primary care setting. The results of a study of Kiri et al. [2] showed that the association of COPD and lung cancer is similar to those observed in other settings.

In our study, male and female patients were equally represented. This is somewhat surprising, since in the majority of reports most patients were male. However, since more and more women in Serbia, like in many other countries, are now smokers, and since smoking is a leading risk factor for both COPD and lung cancer, the incidence of these disorders in women is on constant rise. In our report, smokers prevailed in both sexes (not shown).

The relationship between COPD and lung cancer is was thoroughly investigated. The increased incidence of lung cancer in patients with COPD is now well established [5]. Patients with COPD are at increased risk of developing primary lung cancer [1,6]. COPD is an independent risk factor for lung cancer, with chronic bronchitis and/or emphysema increasing lung cancer risk by 2- to 5-fold as compared with smokers with normal spirometry [7]. Cigarette smoking is an obvious link between both diseases and the resulting chronic inflammation likely plays an important role in the pathogenesis of COPD and lung cancer [8].

Tobacco smoking is a common risk factor for many comorbidities, including coronary heart disease, heart failure and lung cancer [9], although non-smokers with previous lung disease are also at risk for lung cancer [3,10]. A direct relationship between previous lung diseases and lung cancer was also found even in never smokers [11]. Smoking also negatively influences the quality of life of patients with COPD [12].

In conclusion, the number of patients with COPD registered in primary health care was similar in all investigated years. Lung cancer as comorbidity was found in a significantly smaller number of these patients. However, risk factors for morbidity of these two diseases are the same, the age, comorbidities and environment being the most important among them. Genetics is known as very important risk factor, but this factor was not investigated in this study.

The incidence of COPD was similar in both genders, indicating that the same risk factors influence the incidence of COPD. Smoking, physical inactivity, nutrition, and working environment do not play any role on the difference between the two sexes.

## Conflict of interests

The authors declare no conflict of interests.

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