

Prevalence of Smoking and Chronic Bronchitis with Associated Risk Factors in Albania

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Abstract

Background: Although chronic bronchitis symptoms are commonly reported, data on their prevalence across countries, especially in individuals with normal lung function, are limited.

Aims: The main aim of the study was to determine the prevalence of chronic bronchitis and its associated risk factors in Albania. Another aim was to estimate the prevalence of smoking.

Methods: This study is a cross sectional one. A representative population-based sample of adults aged ≥ 40 years was randomly selected in participating centres. Participants who provided written consent, completed a detailed questionnaire. This kind of study was conducted for the first time in Albania and was part of the

BOLD study.

Results: A total of 1200 participants were interviewed, and 997 (83%) were eligible for inclusion. 496 of them (49.75%) were males and 501 (50.25%) were females. The prevalence of smoking among population aged ≥ 40 years was 22.4%. The prevalence among males was higher compared to females (38.8% versus 6.5%). Smoking prevalence in age group 20-39 years was 28.6%; respectively 40.3% in males and 16.8% in females.

The prevalence of chronic bronchitis was 10.6%, and it was higher in males than in females (14.7% vs. 6.6%). The prevalence was higher among the active smokers and ex-smokers compared to non-smokers (4.1% vs. 0.4%), and higher in age

groups 60-69 and ≥ 70 years old (14.5% and 23.5%) compared to other age groups; 40-49 and 50-59 years old (5.6% and 7.1%). The under-diagnosis of chronic bronchitis was more noticeable among subjects with symptoms of chronic bronchitis, only 1.6% declared a previously known diagnosis.

Conclusion: Our study shows a high prevalence of smoking and chronic bronchitis in Albania. We observed a new increasing trend of smoking in young females at age group 20-39 years old compared to other groups ≥ 40 years old. Another finding is that chronic bronchitis is markedly under-diagnosed in the general population.

Keywords: Chronic bronchitis, Prevalence, Smoking, Cohort study

INTRODUCTION

Chronic bronchitis (CB) is a respiratory disease defined clinically as “*the presence of chronic productive cough for at least 3 months a year during a period of two consecutive years*” (1). CB is a common disease among the general population, especially among the middle-aged and elderly groups (2, 3).

It affects about a third of patients with chronic obstructive pulmonary disease (COPD), but also occurs in individuals with normal lung function, with prevalence estimates varying widely both in population-based studies (from 2.6% to 16%) and among COPD patients (from 7.4% to 53%) (4-6). Studies suggest that CB is under-diagnosed in the general population, although it has a noticeable impact on health status, working capability and healthcare resource consumption (6).

The most important risk factors for the prevalence of CB are smoking (personal smoking and exposure to second-hand smoke) and air quality (indoor and outdoor) (7, 8).

Socio-economic conditions could influence the risk of developing CB (e.g., through differences in smoking habits and exposure to other airborne pollutants including occupational hazards), while age, gender, socio-economic and cultural background, may influence the impact and reporting of respiratory symptoms and access to healthcare resources (9).

Large-scale epidemiological studies have shown that chronic bronchitis without COPD has a higher mortality rate than mild COPD (10).

The global prevalence of chronic bronchitis has been estimated at 6.4% (11) and varies considerably by age, sex and geographical area from 2.3% to 28.2% (12-14).

In this article we analyse data from the BOLD study in Albania on the prevalence, burden and potential risk factors of chronic bronchitis symptoms. This was the first study, as part of BOLD study, in Balkan region. The Burden of Obstructive Lung Disease (BOLD) study is an international, cross-sectional study assessing the prevalence and burden of COPD across different parts of the world (15).

MATERIAL AND METHODS

This study is part of the BOLD study in Albania conducted in 2013. The main aim of the present study was to estimate the prevalence of COPD in Albania. Another aim was to estimate the prevalence of chronic bronchitis and smoking, and to identify its associated risk factors. The study was conducted in close collaboration with BOLD operational centre (OC) in London, which provided supervision, training, materials, quality control and data analysis. The approval of the National Bioethics Committee was a prerequisite for study implementation.

The study is cross sectional. In addition to studying the prevalence of COPD and its associated risk factors in adults ≥ 40 years of age, we added a cohort of adults of 20-39 years old just to evaluate the prevalence of smoking in this specific age group and to assess the smoking

trend in Albania, which was not originally included in the BOLD protocol.

The study sample was representative for the whole country. 3 districts were selected: Tirana, Elbasan and Lezha. The sampling frame included a total of 1200 individuals (600 men and 600 women) aged ≥ 40 years selected by a local expert based on data provided by National Institute of Statistics (INSTAT). BOLD OC in London, reviewed and approved sampling methodology.

Recruitment of participants: Participants were chosen from family physicians registers. They were asked to provide written participation consent and to schedule a home or clinic visit.

One of the nine BOLD study questionnaires was dedicated to smoking. The number of packs-year was defined as the average number of cigarettes smoked per day divided by 20 (i.e. packs per day) multiplied by the number of years the person had smoked.

Recorded data about smoking and respiratory

RESULTS

Out of 1200 adults randomly selected to participate in the study, 997 (83%) were eligible for the study, as opposed to the non-eligible group who did not meet the minimum criteria for participation in the study. Of the 997 eligible participants, 496 or 49.75% were males and 501 or 50.25% were females.

The prevalence of smoking among population aged ≥ 40 years was 22.4%. The prevalence among males was higher compared to females (38.8% versus 6.5%).

Table 1 shows that 22.4% of the total population aged ≥ 40 years were smokers at the time of the interview. Males were more likely to smoke than females: 38.7% versus 6.5%, respectively. There are no statistically significant differences between the age groups 40-49 and 50-59 years old, but there is a marked decrease of smoking rate with increasing age. No large variations by age groups were noticed among women.

Table 1. Prevalence of current smoking by age and sex for Tirana, Albania

	Sex	Age				Total
		40-49	50-59	60-69	70+	
Population¹	Male	44.5% (5.2)	46.7% (1.7)	29.4% (5.6)	21.1% (7.8)	38.7% (3.2)
	Female	6.5% (3.2)	8.3% (1.8)	4.8% (4.2)	5.2% (4.5)	6.5% (0.9)
	Total	25.3% (3.2)	27.9% (1.0)	17.1% (4.4)	12.4% (4.0)	22.4% (1.8)

1. Weighted population estimate, with SE shown in parenthesis

signs were reported to BOLD OC for analysis. The statistical method used was Stata v. 12 (Stata Corporation, College Station, TX, USA) and stratified by sex, age, and smoking status.

The age groups with the highest percentage of smoking were 40-49 and 50-59 years old for both men and women.

The prevalence of smoking in age group 20-39 years

Albania is characterized by a young population and the age group 20-39 years old represents one third of the total population. In this age group, males constitute 49% and females 51% of the population.

We interviewed 1200 individuals, 600 males and 600 females. The total number of smokers was 343, and among them 242 were males and 101 females. Smoking prevalence in this age group was 28.6%, with a prevalence of 40.3% in males and 16.8% in females respectively.

In our study we observed that the prevalence of chronic cough of the total population ≥ 40 years was 10.6%. The prevalence among males was higher compared to females (14.7% versus 6.6%). Table 2 shows that the prevalence of chronic bronchitis for both males and females

was higher at age groups 60-69 and ≥ 70 years old.

The correlation of chronic bronchitis to smoking (expressed in pack-years) and sex is shown in the next table.

Table 3 demonstrates that males are more heavy smokers than females in terms of pack-years. Men who smoke, are moderate to heavy smokers; most of them smoke more than 20 packs a year. Women smokers usually smoke to a less degree, mostly 10-20 packs a year (light smokers).

In never smokers the prevalence of chronic bronchitis was 3.4% and higher in females (4.1% in females versus 1.7% in males), which means implication of other contributing risk factors for chronic bronchitis in this subgroup. We observed that the highest prevalence of chronic bronchitis was correlated with smoking of 10-20 pack-years.

Table 2. Estimated Population Prevalence (SE) of Chronic Bronchitis by age and sex for Tirana, Albania

Sex	Age				Total
	40-49	50-59	60-69	70+	
Male	8.1 (3.5)	11.2 (1.3)	23.9 (4.2)	25.8 (8.2)	14.7 (2.3)
Female	3.2 (1.4)	2.9 (1.3)	5.1 (3.7)	21.3 (6.8)	6.6 (0.9)
Total	5.6 (1.9)	7.1 (1.0)	14.5 (3.5)	23.3 (5.3)	10.6 (1.3)

1. Reported cough for three months or more per year

Table 3. Estimated Population Prevalence (SE) of Chronic Bronchitis by pack-years and sex for Tirana, Albania

Sex	Never Smokers	Pack-years			Total
		0-10	10-20	20+	
Male	1.7 (1.3)	1.1 (1.4)	12.2 (8.3)	26.0 (3.3)	14.7 (2.3)
Female	4.1 (1.6)	0	50.4 (11.0)	29.0 (5.5)	6.6 (0.9)
Total	3.4 (1.2)	0.6 (0.7)	28.0 (8.4)	26.1 (3.2)	10.6 (1.3)

The prevalence of self-reported chronic bronchitis was 1.6%, again with a predominance of male over female sex, 2.8% and 0.4% respectively (Table 4).

Only 1.6% of participants who reported symptoms of chronic bronchitis declared a previously known diagnosis of chronic

respiratory disease (2.8% in males versus 0.4% in females), while chronic cough was observed in 10.6% of population (14.7% in males versus 6.6% in females).

In summary, the main characteristics of the study population are presented in the table below.

Table 4. Estimated Population Prevalence (SE) of Self-Reported Chronic Bronchitis¹ by age and sex for Tirana, Albania

Sex	Age				Total
	40-49	50-59	60-69	70+	
Male	1.4 (1.3)	2.3 (1.4)	3.5 (2.1)	6.2 (3.8)	2.8 (1.6)
Female	1.1 (1.0)	0	0	0	0.4 (0.4)
Total	1.2 (0.8)	1.2 (0.7)	1.7 (1.1)	2.8 (1.7)	1.6 (0.8)

1. Chronic Bronchitis is defined as both chronic cough and chronic phlegm for two or more years

Table 5. Basic characteristics of the study population

Total number	Proportion of population (in percentage)	Chronic bronchitis symptoms	p-value
997 (100%)			
Male 496			
Female 501			
Total	100	10.6	
Sex			
Male	49.75	14.7	< 0.001
Female	50.25	6.6	
Age group			
40-49	37	5.6	<0.001
50-59	33	7.1	
60-69	18.5	14.5	
>70	11.5	23.5	
Smoking status			
Never- smoker	63.2	0.4	< 0.001
Ex and current smoker and	36.8	4.1	
Biomass fuel use			
No	38	0.6	<0.57
Yes	62	1.0	

DISCUSSION

The prevalence of smoking in Albania was 22.4%, significantly higher in males than females, respectively 38.7% and 6.5%. The heaviest smokers belonged to the most active age groups, 40-49 and 50-59 years old, and this is the same for both sexes. The frequency of smoking decreased with the increasing age over 60 years.

The prevalence of smoking among younger age group (20-39 years old) was 28.6%. We did not find any significant difference of smoking prevalence in younger age group (20-39 years old) compared to older age groups. Interestingly, the prevalence of smoking among females of younger age groups was quite high, 16.8%, compared to those of older age groups. This shows the increasing trend of smoking among young females in our country.

These data are consistent with other reported data, like those from Albania Demographic and Health Survey 2017-18 by Institute of Statistics and Institute of Public Health Tirana (16). In Albania, tobacco use is a serious health concern (17). Transition to a market-based economy in the early 1990s resulted in a significant increase in the availability of imported tobacco products. At the same time, smoking among young females became more acceptable by our society (18).

Data on the prevalence of smoking in Albania are similar to other Western European countries. In most Eastern countries the smoking prevalence is much higher, like 46% in Montenegro (19).

The prevalence of chronic bronchitis depends on the method and mainly by the definition used for

chronic bronchitis. According to the definition based only on the presence of cough on most days for three or more months a year, the estimated prevalence of chronic bronchitis for Albania in our study of non-institutionalized adults ≥ 40 years was 10.6%. If we use the presence of sputum alone, as a criterion for chronic bronchitis, the prevalence was only 2%. In both cases the prevalence was significantly higher in males than females. In the case of cough-based definition, the prevalence was 14.7% in males and 6.6% in females, while in the case of sputum-based definition it was 3.4% and 0.5%, respectively.

The global prevalence of chronic bronchitis has been estimated at 6.4%, and the prevalence of chronic bronchitis varies considerably by age, sex and geographical area from 2.3% to 28.2% (11, 20). Prevalence estimates of chronic bronchitis varies widely across different countries participating in BOLD studies from 2.6% to 16% (13, 21).

In our study we observed that chronic bronchitis was underdiagnosed. Among people with symptoms of chronic bronchitis, only 1.6% declared a known diagnosis of chronic respiratory disease (2.8% in males versus 0.4% in females), while chronic cough was found in 10.6% of population (14.7% in males versus 6.6% in females).

Most of other studies have shown that chronic bronchitis was markedly underdiagnosed in the general population, and has a significant impact on the health status and well-being of patients, as

well as on the healthcare resource consumption (22, 23).

The prevalence of chronic bronchitis in our study increased with age and was significantly associated with smoking. The association between smoking and chronic bronchitis is well known (24). The prevalence of chronic bronchitis in smokers was 10.6% while in never smokers it was 3.4%.

Our findings showed that the higher prevalence of chronic bronchitis in men was statistically related to higher smoking rates among them.

As mentioned previously, men were much more affected than women from chronic bronchitis. Many studies have demonstrated that chronic bronchitis affects men more than women (25). On the contrary, according to the report of the National Centre for Health Statistics (2009) in USA, 67.8% of patients with chronic bronchitis were women (26). In some other countries, particularly in rural areas, where women were exposed to domestic smoke pollution during cooking, this rate was even higher (27), but in our study we did not find significant correlations between biomass use and chronic bronchitis.

In our study the highest prevalence of chronic bronchitis was found in the age groups 60-69 and ≥ 70 years old, likewise in some other studies such as a survey conducted in the US, where the highest prevalence of chronic bronchitis was seen among subjects 65 years and older (21).

CONCLUSION

Our study shows a high prevalence of smoking and chronic bronchitis in Albania. We observed a new increasing trend of smoking rates in young females at age group 20-39 years old, compared to other age groups ≥ 40 years old. Another finding is that chronic bronchitis is markedly underdiagnosed in the general population.

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Conflict of Interest Statement: The authors declare that they have no conflict of interest.

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