

## Prevalence of Chronic Bronchitis in Selected Districts of Kashmir Valley

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### Abstract

Chronic bronchitis causes high morbidity and mortality throughout the world and it is basically a preventable disease. Kashmir being a high altitude area, with people living in poorly ventilated homes and use of wood as a primary source of fuel in some part of rural areas predispose them to respiratory diseases. The aim of the study is to estimate the prevalence of chronic bronchitis in the age group of 18 years and above in Kashmiri population. It was a community based cross sectional study, with multi stage random sample of 912 consenting participants, aged >18 years and above. The overall prevalence of chronic bronchitis was found out to be 5.4%. The study showed higher prevalence among males compared to females, higher age groups, smokers and people living in overcrowded homes, using wood as fuel and majority of them belonged to low socio- economic status. Concluding that prevalence was less than expected but there still remains room for improvement. The common risk factors of chronic bronchitis like smoking, overcrowding and using wood as a fuel can be dealt with educational interventions and raising the socio- economic status. People in common should be educated about this respiratory disease, its complications and its risk factors.

**Keywords:** Cross sectional, chronic bronchitis, prevalence, risk factors

### Introduction

Chronic bronchitis (CB) is a chronic, ongoing, progressive disease of lower respiratory tract in the lungs. The hall mark of chronic bronchitis is a continuing loose, wet cough that produces excessive amount of mucus. It is a seriously disabling disease with the potential for major complications and can be fatal as it is not treatable. Many studies have reported that smoking, male gender; lower social class and occupational dusts are independent risk factors for chronic bronchitis (CB) <sup>[1]</sup>.

India can be projected as a classical example with reference to rising burden of chronic diseases. Chronic respiratory diseases were shown to account for 7 percent of deaths and 3 percent of disability adjusted life years (DALYs) lost <sup>[2]</sup>.

Tobacco remains the most important risk factor identified as a cause of chronic bronchitis <sup>[3]</sup> and can also occur from long term inhalation of other irritants into the lungs.

Global warming leading to climatic change is a big challenge in front of public health. The United

States Interagency Working Group on climate change and health has identified at least eleven categories of climate change's impact on human health and among these; respiratory diseases are ranking at the top <sup>[4]</sup>.

Kashmir being a high altitude area with people still living in poorly ventilated homes and the use of wood as a primary source of fuel in some parts of the rural areas predispose them to respiratory diseases, chronic bronchitis being one among the leading diseases.

### Objective

To estimate the prevalence of chronic bronchitis and its risk factors among adults aged 18 years and above in the Kashmir valley.

### Material and Methodology

Kashmir falls in the great North –West complex of the Himalayan ranges and is enclosed by high

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mountain chains on all sides except for certain passes and narrow gorges. Here the climate is temperate, with pleasant summer but cold winter. The valley is at 1850 m above sea level with homogenous population.

It was a community based study and was conducted for a time period of six months from March to August 2013. The sampling technique was multi stage random sampling.

Considering the prevalence of Chronic bronchitis as 8%,<sup>[5]</sup> a 95% confidence interval, a design effect of 1.1, an absolute error of 2.5% and a non-response rate of 10%, the sample size was calculated using the following formula:

$$(N = (Z^2pq / e^2) \times \text{Design effect}) \dots (1)$$

Where N = Minimum sample size required.

Z = Z score [1.96 at 95% C.I]

p = Proportion of the factor under investigation (8%)

e = Maximum (absolute) error allowed [2.5%]

q = (1 - p)

Minimum sample size of 745 was selected for the study.

Kashmir valley is arbitrarily divided into three zones- north, central and south. The sample was selected from the study population by multi – stage random sampling. In the **first stage**, three districts were selected randomly by the lottery method from different zones of Kashmir valley, namely district Srinagar, district Pulwama and district Ganderbal. In the **second stage**, from each selected district, one medical block was randomly selected by the lottery method- Block Hazartbal (District Srinagar), Block Ganderbal (District Ganderbal) and Block Pampore (District Pulwama). In the **third stage**, from each selected medical block, one PHC was selected randomly using the lottery method. (10% of sub-centers were selected)-sub center Theed in Hazartbal block, sub center Khullmula in Ganderbal block and sub center Lelhar in Pampore block. In the **fourth stage**, 50% of villages were selected from each sub center. Thus, the total selected villages were 9 out of the three selected sub centers, from each village, population proportionate to size was taken and total subjects came out to be 912.

A door to door survey of each sampled village was conducted by visiting the household of the selected village starting from the road junction located closest to the centre of the village choosing a random direction, and the head of household, or an

appropriate substitute was asked if there is any household member over the age of 18 years. All the eligible members in the household were studied. The process was repeated until the village sample was obtained.

## Procedure

A questionnaire based on the European Community Respiratory Health Survey questionnaire was administered to all<sup>[6]</sup>. All the information regarding general physical examination and systemic examination was recorded. Data was obtained about various risk factors potentially associated with chronic bronchitis including age, sex, formal education, smoking habits, exposure to domestic bio mass, occupation, body mass index etc.

## Definitions

Chronic bronchitis was defined as cough and sputum production on most days during at least 3 months for two successive years.

Overcrowding is defined as people aged above 9 years, who are not husband and wife, being obliged to sleep in the same room.

A person was labeled as a current smoker if the person reported current use of tobacco smoke for at least one year. An ex-smoker was a person who had quit smoking at least one year back and a non-smoker was who had never smoked.

Ventilation of a living room was defined as the window area being one fifth of the floor area.

After recording the responses, weight and height of the subjects were measured. Weight was measured with the subject dressed in light clothes by bathroom scale which was calibrated by a known weight every morning. Height was recorded by a stadia rod.

Obesity was classified according to WHO as follows: Body mass index BMI in kilograms/metre<sup>2</sup>: underweight equal to or less than 18.49; normal weight from 18.5 – 24.9; overweight 25.0 – 29.9; obesity equal to or more than 30.0.

## Statistical Analysis

The data was entered in Microsoft excel and analyzed using appropriate statistical software. Frequencies were obtained using descriptive statistics. A p-value of less than 0.05 was considered statistically significant. Categorical variables were compared using chi – square test.

## Results

A total of 912 subjects aged more than 18 years were screened in the three districts namely Srinagar, Pulwama and Ganderbal. Mean age for

the study subjects was 39.07 years. Distributions of demographic variables are shown in table 1.

**Table 1: Demographic profile of the study population (n=912)**

Gender	Male	<i>n</i>	<i>%</i>
		376	41.2%
	Female	536	58.8%
Education	Illiterate	566	62.0%
	Primary	44	4.8%
	Middle	129	14.1%
	High	79	8.7%
	Senior Secondary	34	3.8%
	Graduate & above	60	6.6%
Occupation	Housewives / home maker	332	36.4%
	Un-skilled workers	155	17.0%
	Skilled workers	60	6.6%
	Employed	57	6.2%
	Shop-owner / business	43	7.7%
	Students	88	9.6%
	Un- employed	173	19.0%
	Others	4	0.4%
Per capita monthly income ( Rupees)	Class I.(5156&above)	8	0.9%
	Class II.(2578-5155)	92	10.1%
	Class III (1547-2577)	136	15.1%
	Class IV.( 733-1546)	363	39.8%
	Class V. (below 773)	311	34.1%
Smoking status	Ex. Smoker	83	9.1%
	Current smoker	197	21.6%
	Never –smoker	632	69.3%
Overcrowding	Present	378	41.45%
	Absent	534	58.45%

Majority of the study population were females (58.8%) as compared to males (41.2%). Among them, 62% were illiterate. By occupation 36.4% were housewives, 19% were unemployed and 17%

were engaged in unskilled workers. Majority of the population belonged to class IV as per capita monthly income. Most of them were non- smokers.

**Table 2: Prevalence of chronic bronchitis among the study subjects**

Sex	n	Chronic bronchitis n	%	P value- <.05
Male	376	30	8%	
Female	536	19	3.5%	
Total	912	49	5.4%	

The prevalence of chronic bronchitis was 5.4%. It was found that its prevalence was

more among males (8%) as compared to females (3.5%).

**Table 3: Prevalence of chronic bronchitis in relation to the smoking status**

Smoking status	Male %	Female %	Total
Current smokers	14 (48.3%)	7 (35.0%)	21 (42.9%)
Ex - smokers	12 (41.2%)	2 (10.0%)	14 (28.6%)
Non -smokers	3 (10.5%)	11 (55.0%)	14 (28.6%)
Chi square test. p value = .002			

The percentage of subjects having chronic bronchitis was more among the current

smokers (42.9%) than among the non smokers (28.6%).

**Table 4: Prevalence of chronic bronchitis in relation to type of smoking**

Type of smoking	Males (n)	Females (n)	Total	P value = .009
Cigarettes	13	0	13(37.1%)	
Hookah	13	9	22(62.9%)	

Majority of them, i.e. 62.9% were hookah smokers and 37.1% were cigarette smokers. The difference

was statistically significant.

**Table 5: Distribution of other risk factors in relation to chronic bronchitis**

<i>Risk factors</i>	<i>CB</i>	<i>n</i>	<i>%</i>	<i>Chi square test</i>
<i>Overcrowding</i>	<i>Present</i>	29	59.2%	<i>P value &lt;0.05</i>
	<i>Absent</i>	20	40.8%	
<i>Exhaust system in kitchen</i>	<i>Absent</i>	43	87.8%	<i>P value &lt;0.05</i>
	<i>Present</i>	6	12.2 %	
<i>Family/O asthma, COPD,</i>	<i>Absent</i>	34	69.4%	<i>P value &lt;0.05</i>
	<i>Present</i>	15	30.6%	
<i>Age</i>	<i>18 - 30</i>	9	16.7%	
	<i>31 -50</i>	12	25.0%	
	<i>51 - 70</i>	28	28.3%	

Other risk factors like overcrowding at home, presence or absence of exhaust system in the kitchen, family history of COPD, asthma were all related to chronic bronchitis and were statistically significant. Chronic bronchitis increases with increasing age, as it was 28.3% among the age group of 51 -70 years and 16.7% among the age group of 18 – 30 years. It has been seen that chronic bronchitis was more among illiterate people which is 79.6% and those who belonged to class IV of socio- economic status. It was seen in this study that CB was more among those using Liquefied Petroleum Gas (LPG) as a predominant source of energy for cooking (59.2%) followed by bio-mass (32.7%). There was no relationship between CB with body mass index.

## Discussion

Chronic bronchitis is one of the most common respiratory diseases and is recognized as a major public health problem. It is a seriously disabling disease with a potential for major complication and at the same time, affecting the quality of life. It develops most often as a result of smoking, but can also occur from long term inhalation of other irritants into the lungs. This study has been done to see the prevalence of chronic bronchitis among the general population of Kashmir.

A total of 912 subjects aged more than 18 years were studied in the three districts of Kashmir Valley in the present study. Out of 912 subjects, 536 were females and 376 were males. During the time of study, more females were encountered at their homes as compared to males because of their outdoor activities.

The overall prevalence of chronic bronchitis was 5.4%, with a higher prevalence in males (8%) than in females (3.5%). Other studies done by Sikand et al. <sup>[7]</sup> in urban parts of Delhi has shown the prevalence of 7.0% in males and 4.3% in females and the findings were consistent with the present study. Quershi KA <sup>[5]</sup> has shown a prevalence of 7.7% in rural Kashmir and Akhtar MA <sup>[8]</sup> has found a prevalence of 15.12% in urban area of Kashmir in the age group of 70 years and above. The higher prevalence in their study may be because their study population was aged more than 70 years. Bhattacharya et al. <sup>[9]</sup> has done a study in Uttar Pradesh and found a prevalence of chronic bronchitis of 6.67% in males and 4.48% in females. On the other hand, Singh et al. <sup>[10]</sup> found a prevalence of 8%. A study done by Thiruvengadam et al. <sup>[11]</sup> in urban Madras had shown a prevalence of 1.9% among males and 1.2% in females, which was low compared to this study.

The frequency of chronic bronchitis increases with increasing age, it may probably be due to longer duration of exposure to risk factors.

In most of the studies done, it has been seen that the prevalence of chronic bronchitis was higher among the males as compared to females; it may be due to different exposure like smoking habit, which was more common in males as compared to females in developing countries. Furthermore, in this study it has been found that more cases of CB were among those who were current smokers.

Socio economic status represents an amalgam of literacy, income and occupation. A low socio economic status is usually associated with a higher frequency of diseases. It has been seen that

majority of study subjects having CB belonged to class IV of socio- economic status as they are more exposed to dust and other air pollutants at their working places. Studies done by different authors have also shown that more percentage of cases belong to lower socio economic status <sup>[12, 13]</sup>. Chronic bronchitis was more among illiterates (79.6%) and 2% among graduates. Education has inverse relation with CB as also shown by a study conducted by Ana Maria et al. <sup>[14]</sup>.

### Conclusion & Recommendation

Chronic Bronchitis was related to smoking, exposure to bio- mass fuel, overcrowding dwellings, low- socio economic status, poorly ventilated kitchen and illiterates.

Chronic bronchitis is related to treatable as well as avoidable factors such as tobacco smoking and environmental tobacco smoke. There is need to strengthen the policy against tobacco smoking which is the most important risk factor. Non-smokers need to be protected from environmental tobacco smoke. Education is also important for behavioral change.

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