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Research Article

A Cross Sectional Study on Prevalence of COPD in Kashmir Valley

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Abstract: COPD is projected to move from sixth to the third most common cause of death worldwide within next twenty years, whilst rising from fourth to third in terms of morbidity within the same time. The study was done with the objectives to study the prevalence of COPD in Kashmir & to suggest early preventive steps for control of COPD. A community based cross sectional study was carried out to measure the prevalence of COPD in men and women greater than 45 years of age. The study was conducted purposively in Central zone of Kashmir Valley which includes three districts district Srinagar, district Budgam and district Ganderbal. The study was carried out in both rural and urban areas, with district Srinagar representing the urban population & district Budgam & district Ganderbal representing the rural population. The multi-stage sampling was adopted for selection of subjects and 5 per 1000 of total population were selected which made a total of 2800 study population (greater than 45years of age) was taken up for the study. The subjects were included, in the study only after obtaining their written consent. Questionnaire was set regarding the symptomatology of COPD like presence of cough, breathlessness, wheezing etc. The subjects who were positive for these symptoms did undergo x-ray chest and Spirometry. A total of 177 study subjects were diagnosed as having COPD out of the total study population of 2800; among the subjects most common symptom was cough present in 254, followed by expectoration present in 132 subjects. Most of the subjects belonged to the age groups of 55-59 and 60-64 years i.e. 28 and 28 of the respective population in the same age groups. However percentage prevalence increase with age i.e. 16.4% in the age group >80 years. COPD was present in 113 males which are 7.9% of total male population and 64 females which is 4.7% of the total female population. COPD was present in 122 rural subjects which is 6.3% of total rural population and 55 urban subjects which is 6.4% of the total urban population. Among COPD patients in the studied population, 109 were smokers which is 61.6%.. The revelation of COPD should give an impetus to take remedial measures at the very outset; thereby playing a distinctive role in prevention. There is an increasing trend of developing smoking habits in both males and females after the age of puberty. This has given an increased population of COPD patients. We have deduced this in our study and this is helpful in prompting us to educate regarding the ill effects of smoking and thereby preventing the heavy burden of COPD.
Keywords: COPD, Spirometry, Prevalance, Kashmir Valley

INTRODUCTION

COPD has been defined as disease, characterized by airflow limitation that is not fully reversible [1]. with a post bronchodilator ratio of forced expiratory volume in one second to forced vital capacity (FEV1)/FVC of <0.7), by the Global Initiative for Chronic Obstructive Lung Disease (GOLD) and International collaborative effort to improve awareness, diagnosis and treatment of COPD.COPD includes emphysema, an anatomically defined condition characterized by destruction and enlargement of the lung alveoli. Chronic bronchitis, a clinically defined condition with chronic cough and phelgem and small airway disease, a condition in which small bronchi are narrowed. Within the next twenty years COPD is projected to move from sixth to the third most common cause of death worldwide, whilst rising from fourth to third in terms of morbidity within the same time [2]. An association between the prevalence of COPD and low socio-economic cases has also been found [3].

Various extra pulmonary side effects of COPD are as follows:

1. Weight loss [4].
2. Cachexia [4].

3. Skeletal muscle dysfunction which is due to sedentary life style [5, 6].
   Due to shortness of breath during exercise, patients with COPD often adopt a sedentary life style; physical inactivity causes net loss of muscle mass, reduces the force generating capacity of muscle and decreases its resistance to fatigue [7].
   Tissue hypoxia [8, 9].
   Systemic inflammation [10-13].
   Oxidative stress [14, 15].
   Tobacco smoke [16, 17].
4. Skelton muscle dysfunction has two obvious consequences.
   a. Weight loss [18].
   b. One of the main causes of exercise limitation [19].
   c. Cardiovascular effects.
   d. Coronary artery disease [4].
   e. Cor pulmonale, CCF [3].
   f. Endothelial damage [20].
5. Nervous System effects.
   a. Altered bio-energetic metabolism within brain [21].
   b. High prevalence of depression [22].
   c. Abnormal autonomic control in patients with COPD [23].
6. Osteoporosis [24].

COPD varies with age and smoking status, occurring rarely in individuals < 40 years old, and less frequently in nonsmokers [25].The most recent guidelines, presented by the Global Initiative for Obstructive Lung Disease, list an FEV1/FVC<O.70 as criterion for COPD [25].With this background the study was done with the objectives to study the prevalence of COPD in Kashmir & to suggest early preventive steps for control of COPD.

MATERIAL AND METHODS

A community based cross sectional study was carried out to measure the prevalence of COPD in men and women greater than 45 years of age. The study was purposively conducted in Central zone of Kashmir Valley which includes three districts, district Srinagar, district Budgam and district Ganderbal. The study was carried out in both rural and urban areas, with district Srinagar representing the urban population & district Budgam & district Ganderbal representing the rural population. The multi-stage sampling was adopted for selection of subjects and 5 per 1000 of total population were selected which made a total of 2800 study population (greater than 45years of age) was taken up for the study. The subjects were included, in the study only after obtaining their written consent. Questionnaire was set regarding the symptomatology of COPD like presence of cough, breathlessness, wheezing etc. The subjects who were positive for these symptoms did undergo x-ray chest and spirometry.

PFT and Dyspnoea Scoring: The tests were carried out with the help of the medispiro and medikro electronic spirometers.

Man oeuvre Performance

After measuring the weight and height of the subjects we initially instructed and demonstrated the test to the subject, to include

1. Corrected posture with head slightly elevated.
2. To inhale rapidly and completely.
3. Positioning of the mouth piece.
4. Exhale with maximum force.

After demonstration we allowed the subjects to perform the test by asking them to assume the correct posture. We attached the nose clip and placed the mouth piece in the mouth and asked the subjects to close the lips around it. Then we asked the subjects to inhale completely and rapidly with a pause of < 1 sec. at TLC. Subjects later exhaled until no more air could be expelled while maintaining an upright posture. The subject was asked to blast not just to blow the air from their lungs and then was encouraged to exhale as completely as possible. Test was repeated for a minimum of three manoeuvres. The subjects were asked to make a full expiratory and inspiratory loop as a single man oeuvre. The maneuver accepted was confirmed by flow volume plot and volume time plot in accordance with 2005 ATS recommendations from the printed volumes and graphs. Three readings were taken for each; the best of these three readings was incorporated in the study with the apparatus making BPTS corrections automatically. The tests were carried out between 17° and 40° as recommended by 1987 ATS update. Dyspnea scoring was done using a medical council scale.

Medical Research Council (MRC) Dyspnoea Scales

1. Grade-1 Breathlessness with strenuous exercise.
2. Grade-2 Breathless when hurrying on a level or going uphill.
3. Grade 3 Breathless while walking on a level at one‘s own pace.
4. Grade 4 Breathless while walking 100 yards or after a few minutes on a level.
5. Grade 5 Breathless to the extent that a person is not able to leave his house.

Patients with grade 3-5 correspond to moderate to severely disabling COPD.
Further following routine investigations were done (wherever required).

- Hb, TLC, DLC, ESR, PBF, BT CT.
- ECG
- X-ray chest (P/A view)

OBSERVATION & RESULTS

Table 1 and Fig-1 demonstrated the age and gender wise distribution of studied population. Studied population was between 45 to ≥ 80 years with mean age 59.0±10.5 years. Maximum numbers of participants (22.1%) were in the age group of 45-49 years with males being 324 (22.7%) and females 295 (21.5%) The subsequent ages groups were 50 to 54 years (18.2%), 55 to 59 years (17.0%), 60-64 years (14.5%) were in the gender proportion which was almost similar.

Table-2 and Fig-2 demonstrates area wise distribution showing that most of the participants were from rural areas 1943 (69.4%) and least from urban areas 857 (30.6%) Among the total rural population of 1943, 989 (69.2%) were males and 954 (69.6%) were females. Among urban population there were 440 (30.8%) males and 417 (30.4%) females.

Table-3 and Fig-3 shows the distribution of studied population with respect to socio-economic status. Most of the studied subjects 1158 (41.4%) belonged to lower middle class followed by average middle class 774 (27.6%).

The table-4 and Fig-4 shows the distribution of respiratory symptoms of the studied population. Most common symptom was cough present in 254 (9.1%), followed by expectoration present in 132 (4.7%) subjects

Table-5 and Fig-5 shows that most of the subjects fall in the age groups of 55 to 59 and 60-64 years i.e. 28 (5.9%) and 28 (6.9%) of the respective population in the same age groups. However percentage prevalence increase with age i.e. 16.4% in the age group >80 years.

Table-6 and Fig-6 shows that COPD was present in 113 males which are 7.9% of total male population and 64 females which is 4.7% of the total female population.

The table-7 and Fig-7 depicts that COPD was present in 122 rural subjects which is 6.3% of total rural population and 55 urban subjects which is 6.4% of the total urban population.

The table-8 shows among the COPD patients in the studied population, 109 were smokers which is 61.6%, pulse was normal in 161 (91%), tachycardia in 13 (7.3%), chest abnormality was present in 93 (52.5%) subjects, CVS abnormality observed in 27 (15.3%). Hb was raised in 40 (22.6%), Haematocrit was raised in 17 (9.6%), ECG abnormality seen in 34 (19.3%) and X-ray chest abnormality in 65 (36.7%).

Table-1: Age and Gender Distribution of the Studied Population

Age (years)	Male		Female		Total		p value
	N	%	n	%	N	%	
45 to 49	324	22.7	295	21.5	619	22.1	
50 to 54	262	18.3	248	18.1	510	18.2	
55 to 59	250	17.5	226	16.5	476	17.0	
60 to 64	213	14.9	193	14.1	406	14.5	
65 to 69	151	10.6	142	10.4	293	10.5	
70 to 74	105	7.3	110	8.0	215	7.7	0.084
75 to 79	54	3.8	56	4.1	110	3.9	(NS)
≥ 80	70	4.9	101	7.4	171	6.1	
Total	1429	51.0	1371	49.0	2800	100.0	
mean ± SD	58.8 ± 10.4 (45, 89)		59.6 ± 10.9 (45, 89)		59.0 ± 10.5 (45, 89)		

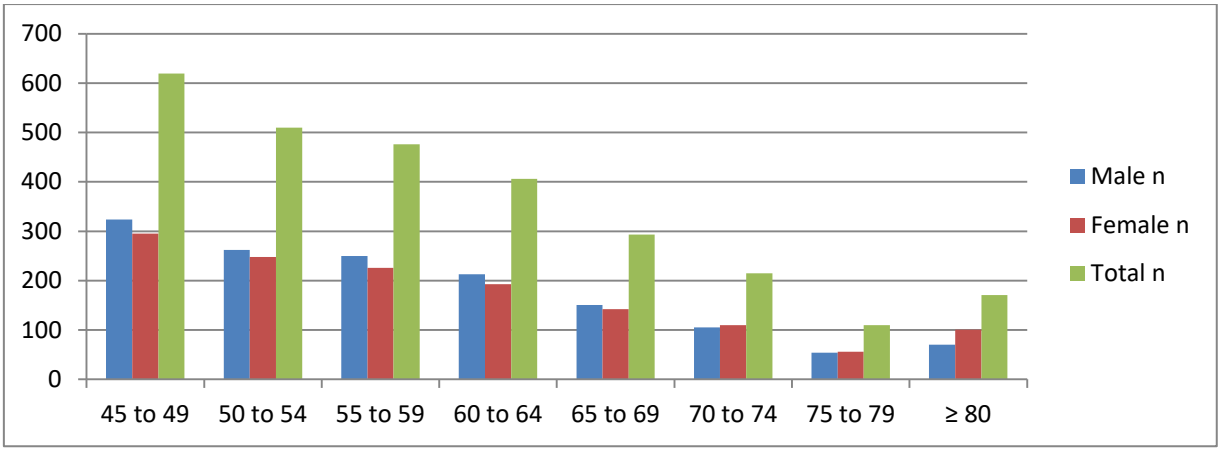

Fig-1: Age and Gender Distribution of the Studied Population

Table-2: Dwelling Status of the Studied Population

Dwelling	Male		Female		Total		p value
	n	%	n	%	n	%	
Rural	989	69.2	954	69.6	1943	69.4	0.830 (NS)
Urban	440	30.8	417	30.4	857	30.6	

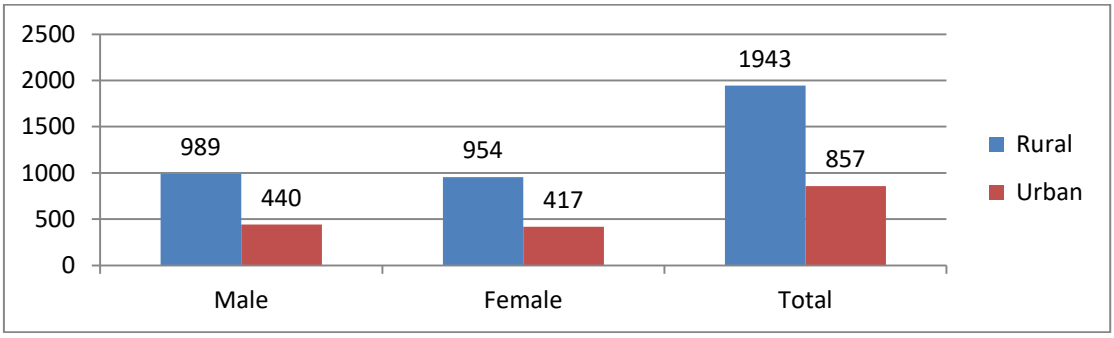

Fig-2: Dwelling Status of the Studied Population

Table-3: Socio-Economic Status of the Studied Population

Socio Economic Status	Male		Female		Total		p value
	n	%	n	%	n	%	
Lower	86	60.0	80	5.8	166	5.9	0.302 (NS)
Lower middle	601	42.1	557	40.6	1158	41.4	
Average middle	394	27.6	380	27.7	774	27.6	
Upper middle	251	17.6	246	17.9	497	17.8	
Upper	97	6.8	108	7.9	205	7.3	

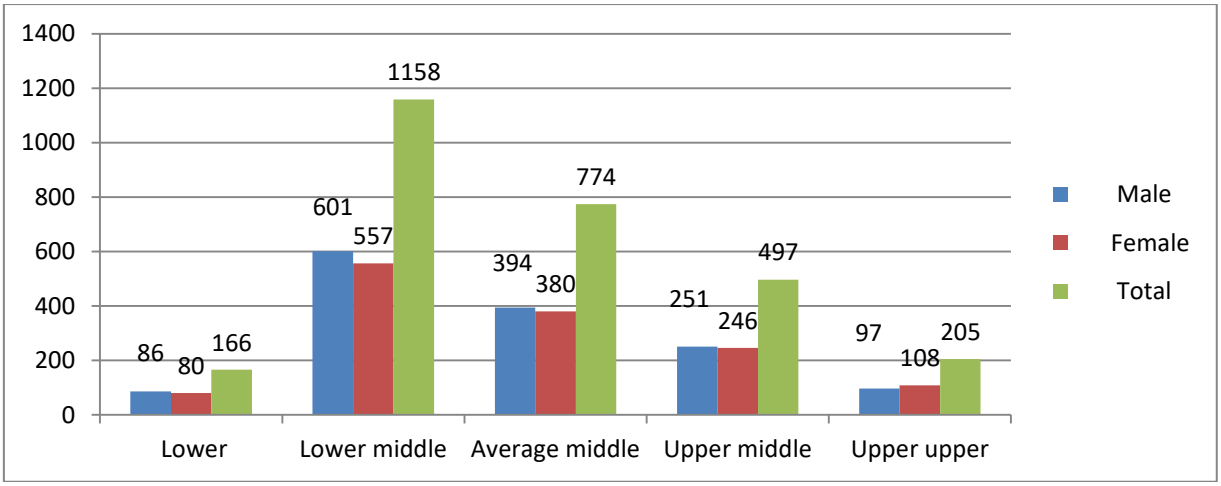

Fig-3: Socio-Economic Status of the Studied Population

Table-4: Distribution of Respiratory Symptoms in the studied population

	N	%
Cough	254	9.1
Shortness of Breath	114	4.1
Expectoration	132	4.7
Wheeze	52	1.9

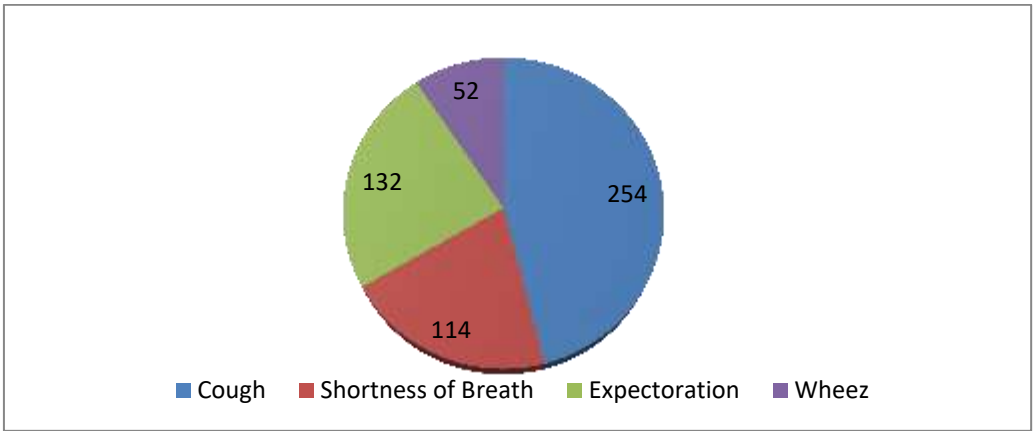

Fig-4: Distribution of Respiratory Symptoms in the studied population

Table-5: Age wise distribution of the COPD in the studied population

Age (Years)	Yes		No		P value
	n	%	n	%	
45 to 49	27	4.4	592	95.6	0.000
50 to 54	22	4.3	488	95.7	
55 to 59	28	5.9	448	94.1	
60 to 64	28	6.9	378	93.1	
65 to 69	15	5.1	278	94.9	
70 to 74	19	8.8	196	91.2	
75 to 79	10	9.1	100	90.9	
≥ 80	28	16.4	143	83.6	

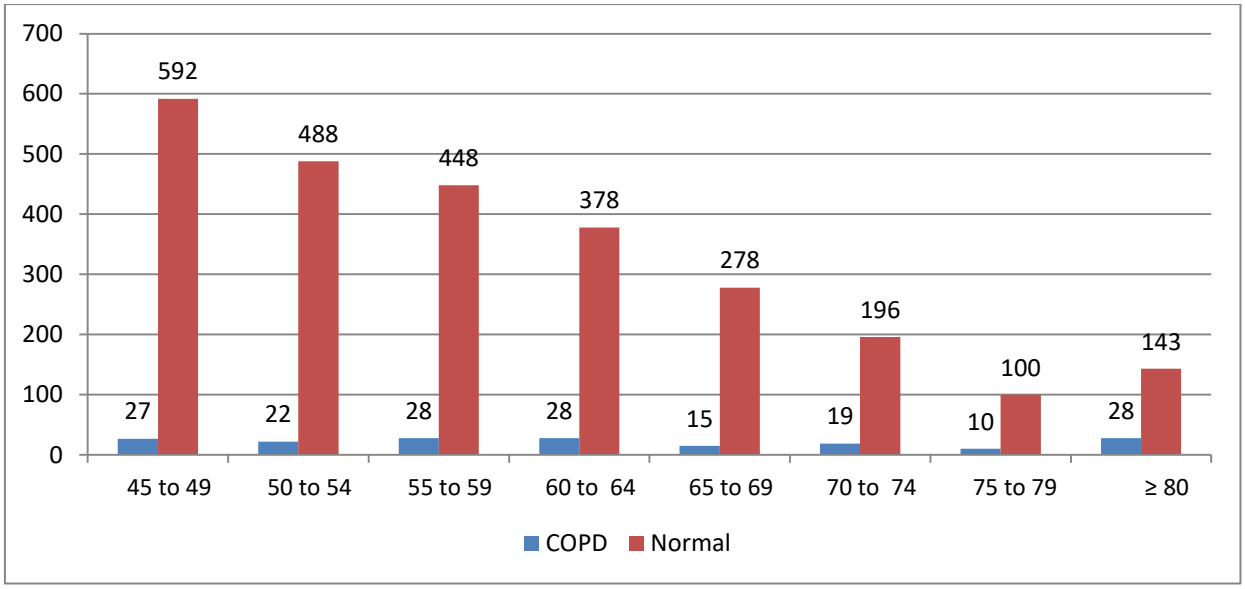

Fig-5: Age wise distribution of the COPD in the studied population

Table- 6: Gender wise distribution of the COPD in the studied population

Gender	Yes		No		P value
	n	%	n	%	
Male	113	7.9	1316	92.1	0.000
Female	64	4.7	1307	95.3	

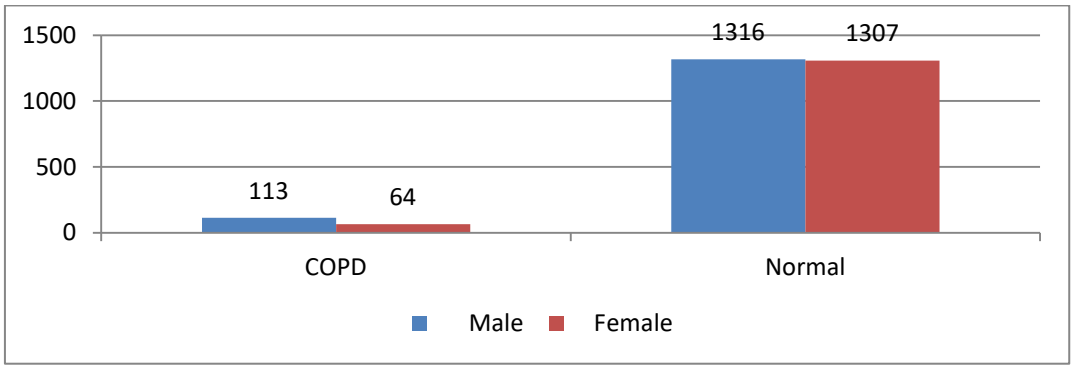

Fig-6:Gender wise distribution of the COPD in the studied population

Table-7: Distribution of the COPD as per Residence

Dwelling	Yes		No		P value
	n	%	n	%	
Rural	122	6.3	1821	93.7	0.889
Urban	55	6.4	802	93.6	

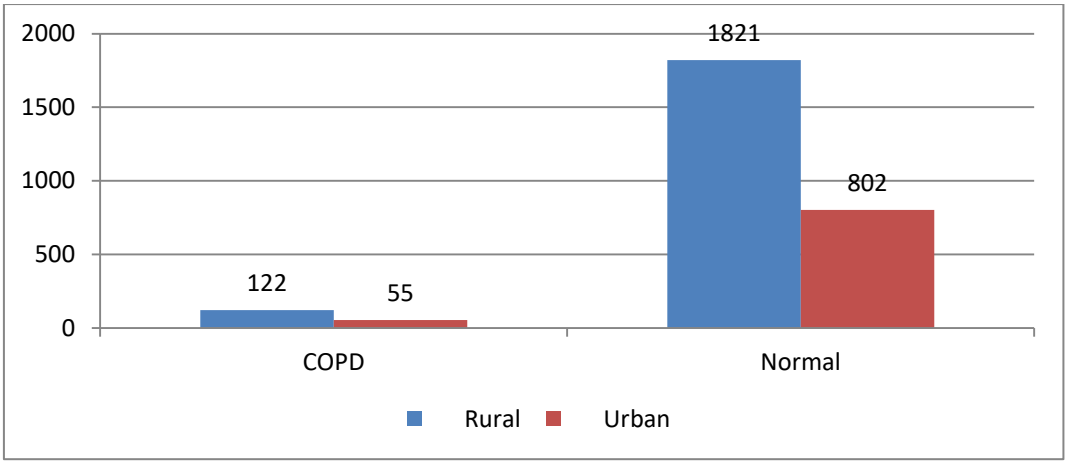

Fig-7: Distribution of the COPD as per Residence

Table – 8: COPD across Confounders

		Yes		No		P value
		n	%	n	%	
Smokers	No	68	38.4	1950	74.3	0.000
	Yes	109	61.6	673	25.7	
Pulse	Bradycardia	3	1.7	34	1.3	0.000
	Normal	161	91.0	2577	98.2	
	Tachycardia	13	7.3	12	0.5	
Chest	Normal	84	47.5	2509	95.7	0.000
	Abnormal	93	52.5	114	4.3	
CVS	Normal	150	84.7	2505	95.5	0.000
	Abnormal	27	15.3	118	4.5	
Per Abdomen	Normal	168	94.9	2447	93.3	0.400
	Abnormal	9	5.1	176	6.7	
CNS	Normal	162	91.5	2351	89.6	0.421
	Abnormal	15	8.5	272	10.4	
Hemoglobin	Normal	137	77.4	1023	39.0	0.000
	Raised	40	22.6	1600	61.0	
Haematocrit	Normal	160	90.4	1560	59.5	0.000
	Raised	17	9.6	1063	40.5	
ECG	Normal	142	80.7	867	77.6	0.362
	Abnormal	34	19.3	250	22.4	
X- Ray Chest	Normal	112	63.3	970	86.3	0.000
	Abnormal	65	36.7	154	13.7	

DISCUSSION

The present study revealed 12.1% of the studied population had respiratory symptoms. Among the various respiratory symptoms in the studied population chronic cough was the most common 254 (9.1%) followed by expectoration 132 (4.7%). The results of our study are similar with the findings of study conducted by Pragiti Chabara *et al.;* [26] at urban Delhi found the prevalence of chronic cough, cough phelgem and dyspnoea was 2.01%, 1.02% and 3.4% respectively.

The prevalence of COPD in our study came out to be 6.3% after being confirmed with spirometry. Among the subjects with these symptoms, COPD in male was 7.9% and in females 4.7%. Our Endings are consistent with PA Mahesh, BS Jayaraji *et al.;* [27] who observed a prevalence of COPD in rural area of Mysore of 7.1% with males 11.1% and females 4.5%. Our study also displayed consistent increase in the prevalence with age. Same results were found by Pragiti Chabbara *et al.;* [26] who also observed in their study worsening of symptoms with increasing age. The prevalence of COPD was found more in smokers than non-smokers

with 13.9% in smokers and 3.9% in non-smokers, and more in males than females. This goes parallel with the study done by PA Mahesh *et al.;* [27] who found prevalence of COPD was 14.7% in smokers. The male to female difference was possibly because of higher prevalence of smoking in males.

CONCLUSION

The study was conducted on 2800 subjects with 1429 males and 1371 females. Out of them, COPD was found in 177 subjects (6.3%), The revelation of COPD should give an impetus to take remedial measures at the very outset; thereby playing a distinctive role in prevention**.** There is an increasing trend of developing smoking habits in both males and females after the age of puberty. This has given an increased population of COPD patients. We have deduced this in our study and this is helpful in prompting us to educate regarding the ill effects of smoking and thereby preventing the heavy burden of COPD.

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