

# THE PATTERN OF LUNG FUNCTION ABNORMALITIES IN SMOKERS OF GINNING MILL WORKERS

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**Background:** The cotton mill workers have increased prevalence of both obstructive and restrictive lung functions compared with control studies. Smoking was found to be an important risk factor for byssinosis and duration of exposure to cotton dust has also been reported to associated with chronic bronchitis, cough, dyspnoea ,evaluate the relation between smoking and incidence of byssinosis in ginning mill workers.

**Aims and objectives:** To determine chronic effects of long term exposure to cotton dust and to Respiratory symptoms in study group-200 ginning(cotton) mill workers. It is further divided into GROUP-I [130] Workers who exposed directly to the cotton dust. GROUP-II [70] Who are not directly exposed but working in other areas like office, watchman etc. Control group- [70] Non-Teaching staff members from BLDEU's Shri BM Patil Medical College , from the same socioeconomic group were taken. The various lung functions like FEV1[ml], FVC[ml], FEV1% and PEFr[lit/min] were measured by using Benedict's recording spirometry and asking questionnaires. GROUP-I [50] and GROUP-II [25] smokers were identified.

**Statistical analysis** was done by 'Z' test and ANOVA test was applied to calculate mean values in various groups.

**Results:** We found [50] smokers in GROUP-I [130] and [25] from GROUP-II [70] .All the lung function parameters were significantly decreased in smokers when compared with non-smokers and controls. where P value is [P<0.05]

**Conclusion:** The smokers are more prone to respiratory disorders and byssinosis compared to non-smokers who are working in ginning mill factory. The lung function parameters were also decreased in the smokers compared to non-smokers group.

**Keywords;** Byssinosis, Pulmonary function tests, Smoking

## INTRODUCTION

The Cotton mill workers have increased prevalence of both obstructive and restrictive lung functions compared with control studies. Smoking was found to be an important risk factors for byssinosis and duration of exposure to cotton dust has also been reported to be associated with chronic bronchitis, cough, dyspnoea.<sup>1</sup>

Byssinosis also called Brown Lung or Brown Lung disease is a type of Pneumoconiosis caused by dust from cotton and other fibers. Inhaled dust stimulates histamine release which causes constriction of the air passages , making breathing difficult over time.The dust accumulates in the lung producing a typical discolourisation that gives the disease its common name.

The disease afflicts mill workers and it takes several years of exposure before manifestations are noticed.<sup>2</sup> Epidemiologic studies of cotton mill workers have demonstrated evidence of chronic lung disease resulting from occupational exposure to cotton dust.<sup>3</sup>

Initially workers have chest tightness and shortness As of breath on the first day of work week . These symptoms subsides as the week continues. the disease progresses, symptoms worsen and may persist through the work week as well as in the absence of work exposure.<sup>4,5</sup>

We have characterized the pattern of lung function abnormalities in cotton mill workers and may be both obstructive and restrictive.<sup>6</sup> In smokers the lung function parameters are decreased compare to non smokers of working population.

Cotton mill workers have an increased prevalence of both obstructive and restrictive lung function patterns compared with control subjects. Similar abnormal patterns are observed with respiratory disease of other etiologies, notably these associated with smoking .

## MATERIALS AND METHODS

To determine chronic effects of long term exposure to cotton dust and to evaluate the relation between smoking and incidence of byssinosis in Ginning(cotton) factory mill workers.

### Study group-200 ginning mill male workers.

**Control group- [70] Male** Non-Teaching staff members from BLDEU's Shri BM Patil Medical College , from the same socioeconomic group were taken.

**GROUP-I [130]** Workers who exposed workers directly to the cotton dust.

**GROUP-II [70]** Who are not directly exposed to the cotton dust but working in other areas like office work, watchmen etc. The various lung functions like FEV1[ml], FVC[ml], FEV1% and PEFr[lit/min] [best of 3 readings] were measured by using Benedict's recording spirometry and asking questionnaires designed by Muralidhar, et .al in their study .Same questionnaire was used by Parikh and National Institute of occupational ,Health, Ahmedabad <sup>7,8</sup> [NIOSH, 1994]. From GROUP-I [50] and From GROUP-II [25] smokers were identified. Total {n=75}smokers were grouped as Study group. Statistical analysis was done by 'Z' test and ANOVA test was applied to calculate mean values in various groups.

### Methods of collection of data;

At the beginning the smokers and non smokers are identified and differentiated and the purpose of the study and content of the consent form was explained to them.

### Exclusion criteria;

Subjects with history of tuberculosis, bronchial asthma, and deformities like gross Kyphosis.

## RESULTS

**Table I ; Relationship between Smoking and incidence of Respiratory Symptoms In Group I and Group II subjects.**  
**No. of subjects with respiratory symptoms**

Workers Group	Smokers	Nonsmokers
<b>Group-I No-130</b>	<b>50</b>	-
<b>Group-II No-70</b>	<b>25</b>	-

**Table II: Different pulmonary function parameters in various categories of Smokers and nonsmokers. values are in  $\pm$  SD**

Parameters	Smoking habits	Group of Subjects		
		Controls	Group-I	Group-II
FVC(ml)	Smokers	-	1728.81 $\pm$ 320.4NS	2007.23 $\pm$ 543.63*
	Non-smokers	2399.5 $\pm$ 588.614	1731.25 $\pm$ 179.15	2890 $\pm$ 625.89
FEV1(ml)	Smokers	-	1148.30 $\pm$ 314.99*	1705.26 $\pm$ 663.81*
	Nonsmokers	2117 $\pm$ 565.38	1368.75 $\pm$ 109.89	2820 $\pm$ 570.74
FEV1%	Smokers	-	65.45 $\pm$ 9.92*	77.31 $\pm$ 12.23*
	Nonsmokers	88.3 $\pm$ 0.104	79.08 $\pm$ 6.055	97.80 $\pm$ 3.12
PEFR(L/min)	Smokers	-	220.67 $\pm$ 55.58NS	327.10 $\pm$ 37.04*
	Non smokers	400.6 $\pm$ 101.58	238.75 $\pm$ 47.64	354 $\pm$ 61.88

NS-Not significant, \*-Significant P<0.05.

We found that [50] smokers in GROUP-I [130] and [25] from GROUP-II [70]. All the lung function parameters are [FVC, FEV1[ml], FEV1% and PEFR L/min] significantly decreased in smokers when compared with non-smokers and control workers. where **P value is [P<0.05]**.

The smokers are more prone to respiratory disorders and byssinosis compared to non-smokers of cotton mill workers. The lung function parameters were also decreased in the smokers compared to non-smokers group.

### DISCUSSION:

Evidences provided by various researchers suggests that byssinosis and other respiratory symptoms are more prevalent among smokers.<sup>9,10</sup>

In our study we have observed that all the workers suffering from one or other type of respiratory disorders are smokers. None of the non-smoker worker suffered from any type of respiratory disorders.

Among men the byssinotic index increased with smoking and dust exposure. Byssinotic workers were found have more chronic bronchitis and dyspnoea than matched controlled workers, It is influenced by cotton dust exposure and smoking.<sup>11</sup>

### CONCLUSION

The smokers are more prone to respiratory disorders and byssinosis compared to non-smokers. The lung function parameters were also decreased in the smokers compared to non-smokers group. Byssinosis is influenced by cotton dust exposure and smoking.

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