

TO STUDY THE ONSET AND PROGRESSION OF AIRWAY ABNORMALITY IN TERMS OF ALTERATION IN PFT IN ASYMPTOMATIC SMOKERS.

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Abstract:

The study was conducted in department of physiology, B J Medical College, Ahmedabad from Mar. 2012 to Feb. 2013. This was a cross-sectional study to evaluate the effect of smoking on lung function and serum lipids in asymptomatic smokers and comparable non smokers.

The mean of the various spirometric parameters were calculated of the subjects for both the groups. The mean FVC in group I and group II was 2.60 ± 0.62 L and 4.10 ± 0.64 L respectively. The mean FEV₁ in group I was 1.91 ± 0.57 L and 3.19 ± 0.77 L in group II Group I had mean FEF_{25% - 75%} and PEF of 1.98 ± 0.67 L/sec and 4.50 ± 1.57 L/sec respectively. Group II had mean FEF_{25 - 75%} of 4.22 ± 1.23 L/sec and a mean PEF of 7.22 ± 1.42 L/sec.

In young smokers and asymptomatic, still the spirometric values were significantly deranged as compared to controls. Even smokers with history of less pack years of smoking also had significant abnormalities of lung function. All the spirometric values in the two groups had statistically highly significant difference and were higher in non-smokers as compared to smokers. The spirometric values were reduced in smokers with history of smoking for as low as two pack years.

Keywords: Progression, PFT, Asymptomatic & Smokers

Introduction:

Spirometric values decline by smoking in the lung function tests. But most of these studies have included older patients who were symptomatic. There is paucity of literature on effects of smoking on lung function in young asymptomatic adults. These are also conflicting results about onset of deterioration of lung function after starting of smoking. This must be helpful in detecting early deterioration of lung functions in asymptomatic smokers.¹

This study has there for been designed to study the effects of smoking on spirometry in asymptomatic smokers because studies have shown that if steps are taken to prevent or stop smoking then some of the deleterious effects of smoking may actually start reverting.²

This study will demonstrate that the patients who participated in the smoking cessation program had a significant reduction in the prevalence of cough, sputum production, wheezing and shortness of breath. This will analyze the improvement in lung

functions occurred in the first year of cessation or not.³

Material & Method

The study was conducted in department of physiology, B J Medical College, Ahmedabad from Mar. 2012 to Feb. 2013. This was a cross-sectional study to evaluate the effect of smoking on lung function and serum lipids in asymptomatic smokers and comparable non smokers.

STUDY POPULATION

The study was conducted on 100 subjects who were equally divided into two groups i.e. of smokers and non-smokers.

Group 1 consisted of 50 smokers.

Group 2 consisted of 50 comparable non-smokers as controls.

Following 10 subjected were not included in the study because.

1. Four subjects were unable to follow the instructions for spirometry,

2. There subjects refused to give blood sample for lipid profile investigation.
3. There subjected did not turn up for the tests

INCLUSION CRITERIA

The following subjects were included in the smoking group:

1. Sex : male
2. Age : 20 years to 30 years

History of smoking for 1-5peak years (1peak year i.e. 10 cigarettes or 15 bidis per day for 1 year)

EXCLUSION CRITERIA

The following subjected were excluded form the study:-

1. History of any mode of smoking other than cigarette and bidis,
2. History of cardio –pulmonary diseases.
3. History of neuro- endocrine disorders.
4. History of liver dysfunction renal impairment,
5. History of atopy,
6. History of exposure to occupation pollutants,

History of drug/alcohol intake.

Results

Table 1: Categories of smokers based on pack years.

Category	No. of pack Years	n
A	0.1 – 1	6
B	1.1 – 2	11
C	2.1 – 3	8
D	3.1 – 4	18
E	4.1 – 5	7

SPIROMETRY

The mean of the various spirometric parameters were calculated of the subjects for both the groups. The mean FVC in group I and group II was 2.60 ± 0.62 L and 4.10 ± 0.64 L respectively. The mean FEV₁ in group I was 1.91 ± 0.57 L and 3.19 ± 0.77 L in group II Group I had mean FEF_{25% - 75%} and PEFR of 1.98 ± 0.67 L/sec and 4.50 ± 1.57 L/sec respectively. Group II had mean FEF_{25 - 75%} of 4.22 ± 1.23 L/sec and a mean PEFR of 7.22 ± 1.42 L/sec.

Table 2: Mean \pm SD Spirometric values of the various categories of smokers

Category of smokers	SPIROMETRIC VALUES			
	FVC(L)	PEV ₁ (L)	FEF _{25-75%} (L/Sec.)	PEFR(L/Sec.)
Group A (n = 6)	3.54 ± 0.43	2.80 ± 0.39	3.13 ± 0.76	6.71 ± 0.98
Group B (n = 6)	2.89 ± 0.44	2.25 ± 0.38	2.29 ± 0.38	5.10 ± 1.34
Group C (n = 6)	2.54 ± 0.51	1.82 ± 0.39	1.92 ± 0.40	4.35 ± 1.15
Group D (n = 6)	2.35 ± 0.51	1.66 ± 0.45	1.68 ± 0.45	3.96 ± 1.48
Group E (n = 6)	2.05 ± 0.32	1.40 ± 0.27	1.39 ± 0.26	3.25 ± 0.73

BLOOD PRESSURE

The mean resting systolic blood pressure (SBP) in group I was 129 ± 5.02 mm Hg and 127.76 ± 5.48 mm Hg in group II. The mean resting diastolic blood pressure (DBP) was 81.92 ± 2.71 mm Hg and 80.76 ± 3.35 mm Hg in the two groups, respectively. The range of SBP and DBP in group I was 112-138 mm Hg. and 76-88 mm Hg while in group II was 110 - 136 mm Hg and 70 - 86 mm Hg.

Discussion

SMOKING AND LUNG DAMAGE

Smoking affects lung function by inhibiting mucociliary action of the respiratory airway. This coupled with mucosal gland hypertrophy result in the accumulation of mucus in the infiltration with inflammatory cells exacerbate airway obstruction.

Smoking recruits inflammatory cells to the lungs. Smoke can stimulate alveolar macrophages to release from neutrophils chemo – attraction and can also cause elastase release from neutrophils. In addition smoke can inactivate alpha 1 antitrypsin probably by oxidation. Local inactivation of alpha-1 antitrypsin may also result from the release of oxidants from activated neutrophils and macrophages. In smokers there for the scan of protease antiprotease imbalance is well and although the detail remain to be define it seems likely that this is the cause of the emphysema found in association with chronic bronchitis.⁴

The mean values of systolic blood pressure (SBP) of the two groups were comparable with no significant difference (129.76 mmHg and 127.76 mmHg, $p > 0.05$). the difference in the mean value of diastolic blood pressure (DBP). Although there was no statistically significant difference in the systolic and diastolic

blood pressures, the smoker still had a higher mean systolic and diastolic blood pressure, (difference of 2.0mmHg and 1.16mmHg respectively) as compared to non smokers.

The effect of smoking on blood pressure is not fully agreed upon. The acute increase in the blood pressures during or shortly after smoking has been reported in many studies, but the chronic effects of smoking on blood pressure is still a subjects of controversy. Kahn et.al⁵ demonstrated a higher 5 year incidence of

Hypertension in smokers have over the age of 40 years,. In contrast Manfred et.al⁶ showed a negative correlation between smoking and hypertension.

Some investigators have also suggested that the difference in blood pressures between smokers and non-smokers are all and are of no real physiological or clinical significance⁷.

Our observations are consistent with that of paffenbarger et.al⁸ who showed no association between smoking and incidence of hypertension.

Conclusion

In young smokers and asymptomatic, still the spirometric values were significantly deranged as compared to controls. Even smokers with history of less pack years of smoking also had significant abnormalities of lung function. All he spirometric

values in the two groups had statistically highly significant difference and were higher in non-smokers as compared to smokers. The spirometric values were reduced in smokers with history of smoking for as low as two pack years.

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