Junil FOR Research	Research Paper	Medical Science	
Private Privat	A Comparative Study of Pulmonary Ventilatory Functions in Smokers and Non-smokers		
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ABSTRACT Smol	king is one of the commonest causes of preventable and pre edical students in the department of physioloay to compare	mature deaths. A case control study was carried out	

non-smokers. Twenty-nine undergraduate students (12 smokers and 17 non-smokers) were taken. Duration of smoking in smokers was 2-3 years. Pulmonary function tests were done by using computerised spirowin-99. We found a significant decrease (p<0.05) in FEV1, FEV1/FVC, PEF, FEF 25-75% and Vmax (25%). This decrease could be due to allergic airways inflammation which is progressive during period of life and may lead to various complications of smoking.

KEYWORDS : Pulmonary ventilator functions, smokers, non-smokers

Introduction:

Smoking is an increasing public health problem in India. It is one of the most common causes of premature and preventable deaths. Environmental Tobacco Smoke (the combination of side stream smoke and exhaled mainstream smoke inhaled by non-smokers) also causes disease in many exposed persons who do not consume tobacco products¹.

Life expectancy for smokers is at least 10 years shorter than for nonsmokers.^{2,3} Quitting smoking before the age of 40 reduces the risk of dying from smoking-related disease by about 90%.³Men who smoke increase their risk of dying from bronchitis and emphysema by 17 times; from cancer of the trachea, lung, and bronchus by more than 23 times.²Smoking increases the risk of dying from coronary heart disease among middle-aged men by almost four times.²

The various adverse effects of exposure to cigarette smoke on different systems has been observed by many workers^{4, 5, 6, 7}. But very few studies are available regarding the effect of short term cigarette smoking on pulmonary function tests. The present study was undertaken to investigate and compare the different ventilation functions in smokers who smoked for 2-3 years and non-smokers.

Material and Methods:

A total of 29 undergraduate male students of J N Medical College AMU Aligarh were taken for this study. Out of these 29 students 12 were smokers and 17 were non-smokers who served as control for study. In all students, age in completed years, height and weight were recorded. The two group of subjects were of comparable age, diet and physical activity level. They were normotensive and non-alcoholic.

The smoking habits i.e. number of cigarette smoked per day and duration of smoking was recorded. They all smoked less than 10 cigarettes/day for 2-3 years. The lung function study was done using computerized Spirowin-99, which is the Windows 95/98 based serial communication spirometer. The subjects were assessed for various lung functions which included measurement of

- Forced Vital Capacity (FVC)
- Forced Expiratory Volume in 1st second (FEV₁)
- FEV,/FVC %
- Peak Expiratory Flow Rate (PEFR)
- Average Expiratory Flow Rate between 25% and 75% of FVC (FEF $_{\rm 25-75\%})$
- Expiratory Flow at 25% of FVC (V_{max} 25%)

All variables were mentioned as \pm S.D. Statistical analysis was done by using unpaired t-test. P value less than 0.05 was taken as significant.

Result:

S. No.	Parameter	Non Smokers n=17	Smokers N=12	P value
1	FVC (L)	3.61±0.44	3.24±0.43	>0.05
2	FEV ₁ (L)	3.27±0.41	2.89±0.33	<0.05*
3	FEV ₁ /FVC %	92.21±3.86	88.75±7.36	<0.05*
4	PEF (L/s)	7.42±0.93	5.52±0.87	<0.05*
5	FEF(25-75%) (L/S)	3.45±0.57	3.45±0.57	<0.05*
6	V _{max} (25%) (L/S)	7.11±0.97	5.13±0.70	<0.05*

*Significant

Table 1 reveals the comparison of pulmonary functions between two groups i.e. non-smokers and smokers. It indicates a significant decrement of FEV_1 , FEV_1 /FVC %, PEFR, FEF(25-75%) and Vmax (25%) in smokers. There is a decrease in FVC, but it is non-significant.

Discussion:

Our study examined the effect of short term smoking (for <3 years) on pulmonary function tests and found a significant decrease in various ventilatory functions in smokers.

Various adverse effects due to short term exposure to cigarette smoking on body weight, appetite, brain neuropeptide Y, arterial wall properties and airways have been observed by different workers in human beings and animals.^{4,6}

The decrease in pulmonary functions in smokers could be due to COPD, characterized by the presence of persistent airflow obstruction that is progressive. It is also evident in a study done by National Heart Lung and Blood Institute and World Health Organization (2001). A study⁵ also observed that exposure of cigarette smoke enhances allergic airway inflammation in mice. The inflammation of airways in smokers can give rise to decreased values of pulmonary function tests in our study.

Conclusion and Recommendations:

The negative impact of tobacco on human health is well documented. This study also shows a significant decrease in pulmonary functions in smokers than in non-smokers even on short term smoking.

Socio-demographic, environmental, behavioural and personal factors are associated with the onset of tobacco use. Environmental factors include availability and advertising of cigarettes, the perception that tobacco use is the norm and peer, parental and sibling's attitude toward smoking⁹. Psychosocial factors like low academic achievement, rebelliousness, low self-esteem, lack of skills to resist offers of cigarettes are important⁹. There is a need to intervene these factors in continuum extending from individual smokers to national and international level

FIG.1: CLASSIFICATION OF PULMONARY FUNCTION TEST





FIG.2: THE PATHOGENESIS OF COPD

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