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"COMPARATIVE STUDY OF PULMONARY FUNCTION TEST BETWEEN SMOKERS AND NON-SMOKERS IN AZMGARH"

Physiology

KEYWORDS: Smoking, Smokers, Non-smokers, pulmonary function test.

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ABSTRACT It is an established fact that, inhalation of tobacco smokes either actively or passively is highly injurious to health. Aim of this was Comparison of pulmonary functions Tests between non-smokers and smokers subjects. The study observed decreased pulmonary functions in smoker subjects compared to the non-smoker subjects.

Introduction:

The use of tobacco leaf to create and satisfy nicotine addiction was introduce to Columbus by native Americans and spread rapidly to Europe. The use of tobacco however is predominantly a twentieth century phenomenon, as is the epidemic of disease cause by this form of tobacco.1 It is an established fact that, inhalation of tobacco smokes either actively or passively is highly injurious to health. Consumption of tobacco has been very common among people, in the form of cigarette as well as bidi (Tobacco filled in Tendu; Diospyrys Melanoxylon or Diospyrus Ebenum, leaf in the shape of small cigarette). Tobacco has remained as one of the most important predisposing factors responsible for so many respiratory and cardiovascular diseases. Chronic Obstructive Pulmonary Disease (COPD) has been recognized as one of the most important causes of morbidity and mortality in chronic tobacco smokers all over the world.2 As Dr. Gro Harlem Brundtland (Former Director General of WHO and former prime minister of Norway) rightly said: "A cigarette is the only consumer product which when used as directed, kills its consumer". Tobacco kills more than five million people worldwide. Tobacco uses both in the smoking and non-smoking form is quite common in India; about 15% to over 50% men use tobacco in this country. Thus tobacco smoke related respiratory diseases like COPD, lung cancer etc., are increasing rapidly. Furthermore, tobacco consumption has a deleterious effect on the course of bronchial asthma, pulmonary tuberculosis, lung function and other lung diseases.3 Moreover, there is accelerated decline in lung function, if airway obstruction already exists.4 Cigarette smoking produces inflammatory changes in small airways, especially in respiratory bronchioles. This leads to dilatation and destruction of small airways, characterized as emphysema.5 The pulmonary damage induced by smoking acts slowly and may show no symptoms until pulmonary functions are lost.6 In a population based of Delhi, the prevalence of bronchial asthma and allergic rhinitis was found to be higher than reported earlier from India. Smoking was one of the major risk factors for higher prevalence of bronchial asthma and allergic rhinitis.7 Smoking is well-known to cause respiratory disorders and pulmonary functions decline and when it co-exists with air pollution, the effects could be more harmful. Tobacco smoking is widely prevalent all over the world and it continues to rise in developing countries. By 2030 the developing world is expected to have 7 million deaths annually from tobacco use.8 Respiratory system evaluation and screening can easily be done by Pulmonary Function Tests. It is an important and useful adjunct for correlation and evaluation of, the presenting complaint of patients like cough and dyspnoea, the imaging studies and pre and post treatment respiratory function status, as well as to identify patients with no or insignificant signs and symptoms of respiratory impairment. Our aim was to comparison of pulmonary functions Tests in between non-smokers and smokers subjects.

Material and Methods:

The present study was conducted in Department of Physiology, Government Medical College Azamgarh during the period from September 2016 to February 2017. The study protocol was approved by the Ethics committee of Government Medical College Azamgarh. The present study consists of total 100 subjects between the age group 20-70 years who are further subdivided into two groups:

i. Group-A : Fifty subjects for non-smoker group as controls.
ii. Group-B : Fifty subject comprised smokers group as cases.

Selection criteria:

The random sample of fifty smokers and fifty non-smokers selected fulfilled the following criteria.

1. Non-smokers :

According to definition non-smoker is a person who does not smoke tobacco. The person under study was not dwelling in the home where their spouse or other family members were smokers of hookah, cigarette, cigar or bidi. In other words they were not passive smokers. A passive smoker refers to exposure to tobacco consumption products from smoking of others.

2. Cigarette smokers :

They are persons who are engaged in the inhalation and exhalation of fumes of burning tobacco in cigarettes. By definition, cigarette smokers are the person who inhale, exhale and burn or carry any lightened cigarette. Every smoker must have been smoked at least five cigarettes a day.

INCLUSION CRITERIA:

- Informed consent from the subject.
- Subjects in the age range between 20-70 years.
- Non-smokers from population of Azamgarh.
- Smokers with present or past history of 10 years of smoking.

EXCLUSION CRITERIA:

- Those subject who did not give consent.
- Recent myocardial infarction less than one month old.
- Asthma and COPD subjects.
- Chronic infections such as tuberculosis or other infections of lungs.
- Subjects with respiratory symptoms such as cough.
- Hemoptysis of unknown origin (forced expiratory maneuver may aggravate the underlying condition).
- Pneumothorax.
- Thoracic, abdominal, or cerebral aneurysms.
- Recent eye surgery (e.g., cataract).
- Presence of an acute disease process that might interfere with test performance (e.g., nausea, vomiting).
- Previous accidents or surgery involving thorax or abdomen.
- Subjects who were not able to give desired co-operation for the test procedure.

The statistical analysis was done using the z test, assuming $p' < 0.05$ as significant.

Results and Discussion:

This present study consists of 100 subjects in the age group of 20-70 years with 50 non-smokers and 50 smokers. The study observed decreased pulmonary functions in smoker population compared to the non-smoker population. Table-1 shows that there were statistically significant changes in pulmonary function (p value < 0.05) between smokers and non-smoker population. Smoking is well-known to cause respiratory disorders and pulmonary functions decline and when it co-exists with air pollution, the effects could be more harmful. Cigarette smoking produces inflammatory changes in small airways, especially respiratory bronchioles leading to dilatation and destruction of the small airways. Unfortunately, the pulmonary damage induced by smoking acts slowly and may not show symptoms until pulmonary functions are.[10] The spirometry is a valuable tool to identify these subjects. Studies showed higher incidence of asthma in smokers due to sensitivity to specific airborne agents and possibly due to overall high IgE level in smokers.[11]

Table-1: Comparison of PFT in non-smokers and smokers population:

Variables	Non-smokers (n=50) (Mean ± S.D.)	Smokers (n=50) (Mean ± S.D.)
FVC (in litres)	2.95±0.05	2.56±0.62
FEV1(in litres 1sec)	2.74±0.57	1.83±0.07
FEV1% (percentage)	95.12±4.31	73.23±21.3
PEFR (in litres/min)	7.72±1.04	5.26±2.26
FEF25-75% (in litres)	4.21±1.25	2.97±1.36

*Statistically significant (P value <0.05)

The study by Vaidya et.al, showed a lower pulmonary function parameters in smokers as compared to nonsmokers, while in ex-smokers, the PFT values were better than in smokers but less than nonsmokers.12 FEV1 was significantly lower than nonsmokers, but not much lower than ex- smokers. The FEF25-75% was also significantly reduced in smokers but FVC showed no significant difference. While in the study by Mohammad et al. showed lower PFT values in smokers in comparison to nonsmokers except MEF 25% (FEF25%) the relationships between quantities of smoking were not significant.13 Smokers are not only the cause of health problems for themselves, but also by producing environmental tobacco smoke, they impose dangers for others. Environmental tobacco smoke constitutes a common problem in many countries. Today, passive smoking, or Environmental Tobacco Smoke (ETS) exposure, is an important health concern worldwide. The study by Padmavathy K.M. at Chennai, India, showed significantly reduced FEV1, PEFR and FEF25-75% in beedi smokers than cigarette smokers. The 'p' value was less than 0.001.14 Our study was similar to the various studies done previously in Indian as well as Foreign studies and revealed that a detailed pulmonary function assessment is required in Azamgarh where prevalence of smoking is higher.

CONCLUSION:

In conclusion there was significant decreased pulmonary function in the smoker subjects in comparison to the non-smoker subjects. Further study for the role of other factors affecting pulmonary function is required.

REFERENCES:

1. Harrison's principles of Internal Medicine. Vol.2, 15 edition. 2574.
2. Abdullah ASM, Husten CG, Promotion of smoking cessation in developing countries: a framework for urgent public health interventions; Thorax 2004; 59: 623-630.
3. Behera D, Respiratory Medicine in India in the 21st century; Indian Journal of Chest Diseases and Allied Sciences 2008, 50: 179-181.
4. Chhabra SK, Rajpal S, Gupta R, Pattern of smoking in Delhi and comparison of chronic respiratory morbidity among beedi and cigarette smokers, Indian J Chest Diseases and Allied Sciences 2001; 43 (1): 19-26.
5. Diane R G, Xiaobin W, David W, Frank E S, James H W et.al, Effects of Cigarette smoking on lung function in adolescent boys and girls; The New England Journal of Medicine, September 1996, 335: 13; 931-937.
6. Down HS, Brandil O, Zellweger JP, et.al, Accelerated decline in lung function in smoking women with airway obstruction: SAPALDIA 2 cohort study; Respiratory Research, May 2005, 6: 45.
7. Eishaan K, Bhargava and Farah Khaliq, Effect of paternal smoking on the pulmonary functions of adolescent males; Indian J Physiol Pharmacol 2008; 52 (4): 413-419.
8. Frag M, Shreesha U, Savici D, et.al, Respiratory brochiolitis; Am J Surg Pathol 2002, 26: 647-53.
9. Gaur SN, Gupta K, Rajpal S, Singh AB, Rohtagi A, Prevalence of bronchial asthma and allergic rhinitis among urban and rural population of Delhi; Indian Journal of Allergy, Asthma and Immunology 2006, 20: 2: 90- 97.
10. Mohammad H B, Hamideh D, Mehdi E, Pulmonary Function and their reversibility in smokers; Tannafos (Journal of respiratory disease, thoracic surgery, intensive care and Tuberculosis), 2003, 2: 8: 23-30.
11. Omar A, Adile B D, Bahar K, Vefa A et.al, Correlation of functional and radiological findings of lung in asymptomatic smokers, Turkish Respiratory Journal, April 2008, 9: 1: 9-15.
12. Vaidya P, Kashyap S, Sharma A, Gupta D, Mohapatra PR, Respiratory symptoms and pulmonary function test in school teachers of Shimla; Lung India 2007, 24: 6-10.
13. Mohammad H B, Hamideh D, Mehdi E, Pulmonary Function and their reversibility in smokers; Tannafos (Journal of respiratory disease, thoracic surgery, intensive care and Tuberculosis), 2003, 2: 8: 23-30.
14. Padmavathy K M, Comparative study of pulmonary function variables in relation to type of smoking; Indian Journal of Physiology and Pharmacology 2008, 52: 2: 193-196.