RISK OF RESPIRATORY MORTALITY OR MORBIDITY IS HIGH WITH CHRONIC TOBACCO SMOKING IN INDIANS

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Abstract:
Tobacco smoking is widely prevalent all over the world and it continues to rise in developing countries. Smoking has a deleterious effect on pulmonary functions. Smoking is the single most significant risk factor contributing to the development of Chronic obstructive airway diseases (COPD). Spirometry by a trained health professional gives an indication of lung health by measuring airway abnormality. Objectives were to study pulmonary function test (PFT) in smokers and non-smokers Tobacco smoking, in the form of cigarettes, has a deleterious effect on the health, mainly on the pulmonary functions. Smoking is highly associated with an abnormal PFT. Cessation of smoking should be encouraged and PFTs from time to time in asymptomatic adults both smokers and non-smokers will be useful for early identification of abnormalities.
Key words: Smoking, Spirometer, Rural areas, Pulmonary function test, Smokers, Non-smokers

Introduction:

Tobacco smoking is widely prevalent all over the world and it continues to rise in developing countries. Various forms of tobacco smoking practised in India, include chutta (reverse smoking), chillum (clay pipe), and hukku (hubble-bubble) with Cigarette and Beedi smoking being the commonest.1 Tobacco smoke contains more than 4000 chemicals and around 40 carcinogens.2 Smoking has a deleterious effect on pulmonary functions. Accumulation of inflammatory cells such as CD8+ T-lymphocytes, B cells, neutrophils and macrophages, in response to irritants found in smoke inhalation, is responsible for an inflammatory reaction. Hence, the risk of respiratory mortality or morbidity is high with smoking.

Tobacco smoking is a well recognized risk factor for the development of coronary heart diseases, angina pectoris and sudden cardiac death [3]. Besides the direct consequences

of smoking on smokers,passive smoking by non-smokers who are exposed to tobacco smoke also has shown an increased risk of respiratory and cardio vascular problems in children [4].There is approximately a 50 % increase in the smoking rates in the low-income countries [5]. In India, smoking is a common habit in both the urban and rural areas in the form of cigarettes, beedies, pipes, cigar, hookah, etc [6].

Cigarette smoking has an extensive effect on the respiratory function and it has been clearly implicated in the aetiology of respiratory diseases like chronic bronchitis, emphysema, and bronchial carcinoma [7]. After the inhalation of cigarette smoke, nicotine is quickly distributed to the brain and it can affect the central nervous system instantaneously [8]. Nicotine affects the cardiovascular system first by stimulating and then paralyzing all the automatic ganglia and so, at first, there is cardiac slowing, followed by the acceleration of the heart rate [9]. Beedi smoke may be more injurious because beedi contains an unrefined form of tobacco as compared to that in the cigarettes [10]. Tobacco smoke contains 4000 chemicals out of which 60 are known carcinogens which can lead to lung cancer. The known chemical constitutes of tobacco smoke include Acetone,Ammonia, Arsenic, Butane, Cadmium, Carbon monoxide,Hydrogen Cyanide, Methane, Toluene, Naphthalene and Vinyl chloride. The smoke of cigarettes is acidic (PH 5.3) and nicotine is relatively ionized and insoluble in the lipids. Only a desired amount of nicotine is absorbed if it is taken in to the lungs where there is an enormous surface area for lower lipid solubility. Cigarette smokers therefore, have a high rate of death due to lung cancer [11].

Material and Methods:
The present study was conducted in Department of Medicine, Sri Lakshmi Narayana Institute of Medical science,Pondicherry. The present study consistsof total 90 subjects between the age group 18-65 years who arefurther subdivided into two groups:
Group-B :23 subject comprised smokers group as cases.**Selection criteria:**
The random sample of 43 smokers and 43 non-smokers selectedfulfilled the following criteria.

Non-smokers :
According to definition non-smoker is a person who does not smoketobacco. The person under study was not dwelling in the homewhere their spouse or other family members were smokers ofhookah, cigarette, cigar or bidi. In other words they were not passivesmokers. A passive smoker refers to exposure to tobaccoconsumption products from smoking of others.

Cigarette smokers :
They are persons who are engaged in the inhalation and exhalationof fumes of burning tobacco in cigarettes. By defnition, cigarettesmokers are the person who inhale, exhale and burn or carry anylightened cigarette. Every smoker must have been smoked at least 5 cigarettes a day.

INCLUSION CRITERIA:
Informed consent from the subject,Subjects in the age range between 18-65 years,Non-smokers from population of Rourkela, Smokers with present or past history of 12 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 oflungs,Subjects with respiratory symptoms such as cough,ŸHemoptysis of unknown origin (forced expiratory maneuvermay 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 withtest performance (e.g., nausea, vomiting),Ÿ Previous accidents or surgery involving thorax or abdomen, Subjects who were not able to give desired co-operation for thetest procedure.

The statistical analysis was done by SPSS-16, $p<0.05$ assignificant.

Results :

This present study consists of 100 subjects in the age group of 18-65 years with 85non-smokers and 85 smokers. The study observed decreased pulmonary functions in smoker population compared to the non-smoker population.

Discussion

Pulmonary function testing is a routine procedure for the assessment and monitoring of respiratory diseases.Spiromeric values vary according to age, height, sex, and body size.3,4 Most of the studies regarding the effect of obesity on pulmonary function tests have been conducted in males, in the age group of 5 to 16 years or they have been carried out in the elderly age groups [10-11].

The spirometry is a valuable tool to identify these subjects. Studies showed higherincidence of asthma in smokers due to sensitivity to specific airborne agents and possibly due to overall high IgE level in[12] smokers. The study by Vaidya et.al, showed a lower pulmonaryfunction parameters in smokers as compared to nonsmokers, whilein ex-smokers, the PFT values were better than in smokers but less[13] than nonsmokers. FEV1 was significantly lower than nonsmokers,but not much lower than ex- smokers. The FEF25-75% was alsosignificantly reduced in smokers but FVC showed no significantdifference. While in the study by Mohammad et al. showed lowerPFT values in smokers in comparison to nonsmokers except MEF25% (FEF25%) the relationships between quantities of smoking [14] were not significant. Smokers are not only the cause of healthproblems for themselves, but also by producing environmentaltobacco smoke, they impose dangers for others. Environmentaltobacco smoke constitutes a common problem in many countries.

Further observed that although the number of alveoli per unit volume and area was identical in boys and girls, the total number of alveoli was larger in boys than girls resulting in larger lung volumes in boys. As a result of larger lung volume but proportionately smaller conducting airways at similar stature, boys are expected to have lower FEV1/FVC % at every age compared to girls of similar stature. Another variable which females consistently failed to exceed was PEFR. As PEFR is the most effort dependent pulmonary function, the difference may reflect gender differences in effort rather than in the function. However, more studies are required to explain the gender differences in the lung function. Studies have found that

measures of body weight and fat were inversely related to the spirometric variables. Adiposity, especially of chest and abdomen was considered to restrict the normal movements of chest and diaphragm).[15] Age was found to be necessary independent variable for all spirometric parameters.

Today, passive smoking, or Environmental Tobacco Smoke (ETS)exposure, is an important health concern worldwide. The study byPadmavathy K.M. at Chennai, India, showed signi□cantly reducedFEV1, PEFR and FEF25-75% in beedi smokers than cigarette smokers [16]. The 'p' value was less than 0.001. Our study was similar tothe various studies done previously in Indian as well as Foreignstudies and revealed that a detailed pulmonary functionassessment is required in Rourkela where prevalence of smoking ishigher.

Conclusion:

Tobacco smoking in any form, bidi or cigarette or both,has significantly deleterious effects on the pulmonaryfunctions. In this rural study area, bidi smoking wasmost common. Almost all the pulmonary functionparameters were significantly reduced in smokers and obstructive pulmonary impairment was commonest.Most cigarette smokers usually smoked non-filtercigarettes since they are cheap and easily available inrural areas.Also, most smokers belonged to rural background andwere of low socio-economic status.A smoker was considered as "deep inhaler" if he drewin the cigarette/bidi with prolonged inspiration, andexhaled through mouth or nose, otherwise he wasconsidered as "puffers". In the present study all thesmokers were deep inhalers .To evaluate dose and duration response relationship,quantification of tobacco smoking was performed bycalculating smoking index for smokers.The smokers were classified into light, moderate andheavy smokers as per the criteria of smoking index.Lung function changes from adolescence to old age but it's differing in males and females. BMI was not significantly associated with the most of spirometric values. In order to generalize these reference values, a larger study following the ATS criteria is needed. As the demographic and anthropometric characters change with the passage of time, a larger study following the criteria set by ATS is required for this purpose. Finally it may be concluded that smoking causes definitepulmonary function impairments specially the obstructivetype.

In this study in a rural area, cigarette smoking was found to lead tothe reduction of almost all the pulmonary function parameters andobstructive impairment was the commonest finding.Hence, the risk of respiratory mortality or morbidity is high withchronic tobacco smoking.

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