

LETTER TO EDITOR

EFFECT OF 'KHAINI' – A FORM OF SMOKELESS CHEWING TOBACCO ON PULMONARY FUNCTIONS

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Sir

Tobacco use is a public health concern worldwide as well as in India. Tobacco consumption is mainly done in two forms: smoked tobacco and smokeless tobacco. The tobacco use without burning is referred to as smokeless tobacco (SLT) use. SLT use has been increased rapidly throughout the world especially among adolescent boys and young men by considering it as safe alternative of smoking. Because of vigorous efforts toward increasing awareness of the adverse effects of tobacco, smoking has been declined and paradoxically the use of SLT has been greatly increased (1). 'Khaini', tobacco with slaked lime, is one of the widely used SLT in India (2). Cigarette smoking has extensive effects on respiratory function (3). Like cigarette the most important constituent of 'khaini' is tobacco. This study attempts to find out whether 'khaini' causes any unfavorable effects for the lungs by using PFTs. In this study pulmonary function indices of 'khaini' users were compared with those of nonusers control subjects.

The present cross sectional study was conducted in slum area of Chinsurah, district Hooghly of West Bengal state in accordance with Helsinki declaration. The written consent from the subjects involved in the study was obtained. The study population

included 202 male subjects comprising of 105 exclusive SLT users and 97 nonusers aged between 18-70 years. Both control and experimental subjects were from same socio economic status and were involved in same occupation. Subjects of both groups were matched by BMI. Exclusion criteria for the subjects included presence of any self reported acute illness, lung diseases like chronic obstructive pulmonary disease, heart failure, malignant, chronic liver or kidney failure, diabetes mellitus, history of heavy alcohol or recreational drug use and smoking habit for at least last three years. At first interview was done with a structured questionnaire to obtain information on age, occupation, education, food habit, socio economic status and tobacco related behaviors including type of tobacco use and duration of use. Subjects those were never taken any type of SLT were placed into control group. Subjects those take 'Khaini' at least last three years were placed in the experimental group. Body weight was measured using bathroom scale accurate to 0.5kg. Height was measured by using anthropometric rod. Body mass index (kg/m^2) was calculated. Subjects having BMI between 18.5-25.0 were selected for pulmonary function tests. Spirometry was done using computerized spirometer (Medikro Spirostar USB Spirometer, Model: M929, Finland). The subject was asked to sit

comfortably in a chair. The complete procedure was explained, all doubts if any were cleared. The subject was instructed to breathe in full by deep inspiration with closed nostril and forcefully expire the air out, as fast as possible. Three trials were given for each subject. Best of the three was recorded and analyzed. Forced vital capacity (FVC), forced expiratory volume in 1st second (FEV1), Forced expiratory flow between 25% and 75% of forced vital capacity (FEV25-75%) and peak expiratory flow rate (PEFR) were represented in our results.

The statistical significance was determined by student’s t test. P value less than 0.05 was accepted as statistically significant. The relationship between pulmonary function indices with duration of ‘khaini’ use were evaluated via Pearson correlation test. There was no significant difference in the anthropometric parameters including age, height, weight and BMI but all pulmonary function indices except FEV1/ FVC showed statistically significant difference between ‘khaini’ users and nonusers (Table I). Pulmonary function indices showed negative correlation with age (Table II).

TABLE I: Comparison of lung function indices between Khaini users and nonusers.

Parameters	Khaini users (n=105)	Khaini non- users (n=97)	P value
Age (years)	43.84±2.44	43.33±2.38	0.8270
BMI (kg/m2)	22.12±2.26	22.65±2.38	0.2539
FVC (lit)	2.47±0.59	3.18±0.54	0.0000
FEV1 (lit)	2.10±0.45	2.76±0.49	0.0000
FEV1/FVC (%)	86.20±11.69	87.00±7.38	0.4293
PEFR (L/S)	4.36±1.46	5.89±1.82	0.0000
FEV25-75% (L/S)	2.74±0.96	3.52±1.14	0.0000

*Data expressed are mean±SD.

TABLE II: Correlation between age and pulmonary function parameters.

Pulmonary function parameters	Khaini users (n=97)		Khaini nonusers (n=105)	
	r	p	r	p
FVC	-0.983	0.0034	-0.957	0.0131
FEV1	-0.959	0.0116	-0.932	0.0140
PEFR	-0.783	0.1321	-0.937	0.0150
FEV 25-75%	-0.947	0.0163	-0.746	0.1408

There was no considerable difference between economic status of control and experimental group of individuals. Education standard has been found worse among ‘Khaini’ users in comparison with its nonuser counterpart. Expenditure on tobacco has been found significantly higher in proportion of their daily income in India (4). The cause may be of poor living status and lack of intake of antioxidant rich food in their diet. Smokeless tobacco produces oxidative stress resulting from imbalance between formation of reactive oxygen species and antioxidants contribute chronic airway limitation (5). Antioxidant rich foods such as green-leafy vegetables and fruits that may help to reduce the oxidative stress caused by tobacco (6) are usually lacking in the diet of studied subjects. This makes them more vulnerable to tobacco-induced oxidative stress. Thus ‘khaini’ induced low pulmonary function indices may be due to increased oxidative stress. This study is done on a small group and hence the results might be more conclusive on a large sample.

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