Comparison of Spirometric Variables Between Moderate Cigarette Smokers and Moderate Huqqa Smokers

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Summary

Eighty moderate smokers were chosen to find out the effect of commonly used modes of smoking, i.e. cigarettes and Huqqa, on Pulmonary Function Tests (FEVI, MMFR and MMFT). Pulmonary Function Tests demonstrated a significant difference between these two groups of smokers smoking with the same intensity.

Introduction

It is generally accepted that cigarette smoking increases the chance of obstructive lung disease. Lung diseases most commonly associated with cigarette smoking are bronchitis, emphysema and lung cancer (Dosman *et al,* 1982).[1] There is an increase in the number of mucous glands in the bronchial epithelium of the smokers, and the mucous ciliary defence of their bronchi is reduced. Cough, sputum and impairment of lungs are all increased by greater inhalation of smoke, high puff frequency, keeping the cigarette in mouth, degree of inhalation and the use of plain cigarettes rather than filtered cigarettes (WHO Expert Committee Report, 1979). In our country majority of smokers residing in villages use Huqqa as a smoking device. Our main aim was to study any difference of Pulmonary Function Tests between moderate cigarette smokers and moderate Huqqa smokers.

Material and Methods

Eighty adult males in the range of 25 to 65 years of age were selected by random sampling from the area of Gawalmandi, Lahore. The subjects were chosen from the lower socio-economic class (Federal Bureau of Statistics, 1979). Subjects practising vigorous exercise as a part of their job or exercising regularly were not included in the study. After the selection of subjects, general physical examination and auscultation of chest for heart and lungs were done. Any subject ha-

ving acute or chronic cardio-respiratory disease was excluded from the study. The subjects were then further subdivided into the following categories:–

i. Moderate cigarette smokers. Forty subjects were analyzed in this group: smoking 10 to 20 cigarettes per day.

ii. Moderate Huqqa smokers. Forty subjects were analyzed in this group: smoking 0.25 to 0.5 chattak of tobacco (ordinary quality) in Huqqa per day.

Vitalograph S-Model Spirometer was used for measuring Forced Vital Capacity (FVC). At least three acceptable tracings were obtained from each subject in standing position; mean of the three was used for further statistical analysis (Ullah et al, 1983). Forced Expiratory Volume in first second (FEV_1) and Maximum Mid-expiratory Flow Rate and Time (MMFR AND MMFT) were calculated from the FVC curve. All figures of the pulmonary functions in the study were converted to body temperature and pressure fully saturated with water vapour (B.T.P.S.). The above mentioned tests were calculated from the FVC curve by a flow rate calculator and a percentage scale parallel ruler.

Results

A summary of important spirometric data collected from forty Huqqa smokers and forty cigarette smokers is compared in Table I. Comparison of the mean values for three variables (FEV_1, MMFR and MMFT) demonstrated a significant ($P < 0.05$) difference between the two groups of smokers (moderate Huqqa and cigarette smokers), smoking with the same intensity (Table I).

TABLE I

MEAN ± SD COMPARISON OF FEV_1, MMFR AND MMFT BETWEEN MODERATE HUQQA AND MODERATE CIGARETTE SMOKERS

Lung Function Tests	Moderate Huqqa Smokers		Moderate Cigarette Smokers		Mean Difference	z Value
	Mean ± SD (n = 40)		Mean ± SD (n = 40)			
FEV_1 (L)	2.71	0.54	2.12	0.54	0.59	2.36(S)
MMFR (L/S)	2.79	0.66	1.90	0.84	0.89	2.87(S)
MMFT (Sec)	0.60	0.16	0.94	0.49	0.34	3.40(S)

z is significant ($P < 0.05$) if > 1.96.

FEV_1 of moderate Huqqa smokers (2.71 + 0.54 L) differed significantly ($P < 0.05$) from that of moderate cigarette smokers (2.12 ± 0.54 L);

MMFR of moderate Huqqa smokers (2.79 ± 0.66 S) differed significantly ($P < 0.05$) from that of moderate cigarette smokers (1.90 ± 0.84 LS) and

MMFT of moderate Huqqa smokers (0.60 ± 0.16 Sec) was also significantly different ($P < 0.05$) from that of moderate cigarette smokers (0.94 ± 0.49 S).

Discussion

The increase in the use of tobacco is incompatible with the maintenance of good health. Cigarette and Huqqa are two methods of tobacco smoking in Pakistan. Comparison of the hazardous effects on lung functions by the two modes of smoking has not been evaluated so far. During this study we found a significant difference in lung function tests (FEV_1, MMFR, and MMFT) between moderate Huqqa smokers and moderate cigarette smokers. Part of the carbon particles suspended in the smoke of Huqqa may be precipitated when passed through Huqqa water. As observed by Higenbottom et al (1980),[3] an initial drag of smoke into the mouth followed by subsequent inhalation of smoke into the lungs could minimize the irritant qualities of the tobacco smoke. This observation is comparable to the Huqqa in which smoke first passes through the water and then enters the lungs.

Studies in the past indicated that FEV_1 is a sensitive index of minor degree of pathological narrowing of the peripheral airways (Morgan, 1979).[5] There was significant difference in FEV_1 ($P < 0.05$) in moderate Huqqa smokers (2.71 ± 0.54 L) and moderate cigarette smokers (2.12 ± 0.54 L). The test showed the possible chronic irritant effect of cigarette smoking in which smoke had not filtered through water.

Mc Fadden and Linden (1972)[4] postulated that low MMFR results from increased resistance to airflow in airways less than 2.00 mm in diameter. Thus this measurement should be employed more widely for the early detection of small airway obstruction. Measurement of MMFR showed a significant difference ($P < 0.05$) between moderate Huqqa smokers (2.79 + 0.66 L/S) and moderate cigarette smokers (1.90 ± 0.84 LS).

MMFT showed a significant difference ($P < 0.05$) between moderate Huqqa smokers (0.60 ± 0.16 S) and moderate cigarette smokers (0.94 ± 0.49 S). MMFT also represents airway obstruction in small peripheral airways.

Further study should be done on Huqqa smokers and cigarette smokers by determining their blood gases and blood nicotine levels.

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