Original article

Assessment of peak expiratory flow rate in chronic alcoholics

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Abstract

Introduction: Peak expiratory flow rate is relatively a crude measure of lung function, and it has also been used as screening tool in surveys. As consumption of alcohol is very common in Indians and known to cause airway disease, present study has been undertaken to assess the effect of chronic alcoholism on peak expiratory flow rate.

Methods: Peak expiratory flow rate is measured using 'Computerised Medspiror'and the best of three readings are used. A total of 120 chronic alcoholics and control participated in the study.

Observation and Results: the results of observed values of Peak expiratory flow rate in litres/sec.showed a significant decrease ($p<0.05$) in chronic alcoholics as compared to control group.

Conclusion:Chronic alcoholism has deleterious effects mainly on lung and liver. In our present study chronic alcoholism is found to lead to severe reduction in PEFR with airflow limitation in large airways ,hence risk of respiratory morbidity and mortality is high with chronic alcoholism.

Key words: Peak expiratory flow rate ,lung function ,chronic alcoholism

Introduction

All respiratory symptoms either alone or in combination were associated with lower peak expiratory flow values in both men and women .Shortness of breath as a single symptom was also associated with much lower PEFR.and may lead to significant airway obstruction.

Alcohol consumption is known to accelerate deterioration of lung function.[1] PEFR may be a prognostic indicator in subjects who are on a treatment of obstructive airway disease, and decrease in PEFR is an important indicator of declining health in elderly[2,3] It also reflects the strength and condition of respiratory muscles and the degree of airflow limitation in large airways[4].

Aims and Objectives:

1) To determine the lung function mainly peak expiratory flow rate in chronic alcoholics,

2)To study the degree of airways obstruction in chronic alcoholics.

3) Whether chronic alcoholism is positively associated low socio economic status, poor nutrition ,lack of education, elementary job.

Materials and Methods

The study was carried out at SRTR Medical College Ambajogai,prior permission from Head of the Department of medicine and Dean of this institute was obtained .The subjects were selected from Medicine OPD and male medicine ward. Total of 120 male subjects between 20-60 years were selected, of that 60 were chronic alcoholics and 60 were apparently healthy volunteered subjects ,who served as age matched controls.

Informed consent was obtained ,participants were non-smokers,non-obese,non-athletes but free from respiratory tract infections .chronic alcoholic patients suffering from respiratory diseases like pneumonia, chronic bronchitis and emphysema were included only after antibiotic treatment

ensuring they are recovered from above respiratory diseases.

PEFR was recorded by Computerised Medspiror (Recorders& Medicare Systems Chandigarh) .The subjects were instructed to take maximum inspiration and blow into the mouthpiece as rapidly, forcefully and completely as possible .It was ensured that a tight seal was maintained between the lips and mouthpiece of the medspiror .The best of three trials was recorded for each subjects .Calibration of the medspiror and all testing protocols in the instruction manual of the Computerised Medspiror are followed.

In the present study only pre (observed) values are considered for calculation. The data was analysed by students unpaired ' t' test. Statistics were tested at P<0.05 level of significance the data was reported as mean _+ standard deviation.

Observation and results.

Table I: Observed values of PEFR in litres/sec. in control and chronic alcoholic patients (ALC)

Parameter:PEFR in litres/sec.								
Age group	21-30		31-40		41-50		51-60	
	Control n=13	ALC n=10	Control n=18	ALC n=19	Control n=15	ALC n=16	Control n=14	ALC n=15
Mean	10.37	6.67	10.26	7.22	10.28	4.86	9.1	4.86
SD	0.58	1.78	0.58	1.81	0.39	2.08	1.83	2.05
t-test	P<0.05		P<0.05		P<0.05		P<0.05	

The PEFR values were decreased and found to be significant statistically in all age groups when compared with control group.

Discussion

Peak expiratory flow rate is the maximal expiratory flow rate achieved and this occurs very early in the forced expiratory manoeuvre.The peak expiratory flow rate measures how fast a person can breathe out or exhales air .It is a simple method of measuring airway obstruction and detects moderate to severe disease [5] .In people with obstructive airway disease,whether acute or chronic,PEFR provides an objective indication of the degree of obstruction .pre (observed) values of PEFR is often used as a management plan[6,7].

In the present study we have observed pre the observed values for calculation. Most of studies show that gender and height affect lung with males and taller subjects having a higher PEFR.[8,9].A study among adult Singaporean Chinese[10] and another study among rural residents of Tamilnadufound similar results.[11]It has been found that men have higher lung volumes ,larger diameter airways and larger diffusion surfaces compared to women but in the present study only male subjects were included.[12]

People who are not exposed to noxious particles have better lung function with higher PEFR compared to those exposed to noxious particles because air pollution has a negative effect on an adult lung function.[13] Inhalation of noxious particles causes abnormal inflammatory response which leads to airflow limitation[14,15] In the present study most of the participants were exposed to noxious particles were uneducated or

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having lower levels of education, and were employed as elementary workers. There was a close association of occupation and education .those working as elementary jobs were more likely to be exposed to dust ,hazardous chemicals such as pesticides, insecticideaerosols which may contribute to decreased lung function.[16,17] A study done in Boston in 1988 showed that PEFR was positively related to education. Furthermore,education may enable individual to make better choices regarding food and lifestyle, it has also been suggested that high intake of nutrients with antioxidants properties may reduce the rate of loss of lung function inadults.[18]

Unfortunately this was not true with chronic alcoholics most of them were belong to low socio economic status. Poor nutrition, lack of education and elementary workers

Moreover as they were regular consumer of alcohol in the form of country liquor 200ml ,whisky700ml/day ,at any time of day, continuously for five years .The chemical nature of alcohol mainly irritant present in alcohol cause release of elastage from alveolar macrophages [19-21] that degrades structural elements of the lung which may lead to loss of elastic recoil causing decrease in PEFR , more over the bactericidal activity of alveolar macrophages is generally accentuated, but subjects with high blood alcohol levels the bactericidal activity of alveolar macrophages may decrease.[22].

Conclusion

Chronic alcoholism has deleterious effects mainly on lung and liver. In our present study Chronic alcoholism has been found to lead to reduction in PEFR and obstructive impairment is the commonest finding, hence the risk of respiratory morbidity and mortality is high with chronic alcoholism. In the present study chronic alcoholism has been associated with poor nutrition, low socio-economic status,elementary jobs and affect PEFR and this may be leading to reduction in pulmonary function with obstructive impairment mainly large airways.

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