EFFECT OF CIGARETTE SMOKING ON PEAK EXPIRATORY FLOW RATE: A SHORT REVIEW

Sunita Nighute[1], Kiran Buge[2], Siva Kumar[3]

Received: 2017
Revised: 2017
Accepted: 2017

Author details:
[1]Professor, [2,3]Assistant Professor, Department of Physiology, DVVPFs Medical College, Ahmednagar, Maharashtra, India
Corresponding author: Sunita Nighute, Professor, Department of Physiology, DVVPFs Medical College, Ahmednagar, Maharashtra, India
Email: drsunitanighute@gmail.com

ABSTRACT

Tobacco smoking in India has been increasing alarmingly. Smoking is a known risk factor for chronic obstructive pulmonary disease (COPD), cardiovascular diseases and certain cancers, especially, the lung cancer. Carbon monoxide from the smoke and nicotine both put a strain on the heart by making it work faster Peak expiratory flow rate (PEFR) is a simple index of pulmonary function and can be used in researchers, clinical practices and even under field conditions to assess the status of large airways. PEFR is decreased in cigarette smokers compared to non-smokers and the magnitude of decline is higher in elderly individuals.

KEYWORDS: Peak expiratory flow rate; Smokers; Wright's peak flow meter.

INTRODUCTION

Smoking can cause various pathophysiological effects. It has been identified as the most important risk factor in Chronic Obstructive Pulmonary Disease (COPD)[1]. It significantly increases progressive deterioration of lung function. Pulmonary Function Test is a test to examine functional capacity of lungs and respiratory system. The common parameters measured in pulmonary function test are Peak Expiratory Flow Rate (PEFR) and Maximum Voluntary Ventilation (MVV).

Tobacco smoking is a major risk factor for cardiovascular disease, chronic obstructive pulmonary disease and some cancers and the morbidity and mortality with tobacco use is entirely preventable [2]. Smoking harms nearly every organ in the body, causing many diseases and reducing health in general. Further, a quarter of smokers develops chronic obstructive pulmonary disease [3] and is the fourth commonest cause of death worldwide [4]. COPD is characterized by airflow limitation that is not fully reversible [5, 6]. Air flow limitation may be due to inflammation [5, 7] or due to increase in the thickness of the wall[8]. PEFR is a useful parameter to monitor airway obstruction, assess its severity and variation and evaluate the effects of treatment [9]. Earlier studies have reported that the PEFR is an effort dependent parameter emerging from large airways[10-12] and it does not detect small airways obstruction [13]. Further, there are inconsistent findings which showed that smoking affects medium and large airways [14, 15]. Others have reported that smoking affects both small and large airways [16, 17]. Several studies have reported that PEFR was significantly lower in smokers than in non-smokers [18-22]and some studies found maximum reduction in PEFR was in bidi smokers than cigarette smokers[23]. One possible reason for the decrease in PEFR could be inflammation which is common and constant pathological finding in cigarette smokers [24].

It has significant deleterious effects on respiratory tract. Smokers even if they are symptom free, have lower values of PEFR than non smokers. The diminution of PEFR runs more or less in parallel with the duration of smoking. Beedi smoking affects respiratory tract has significant deleterious effects on respiratory tract. Smokers even if they are symptom free, have lower values of PEFR than non smokers. Early detection of air flow obstruction and smoking cessation may result in significant health gain.

Access this article online

Quick Response Code

ISSN: 2523-6695 (print)
2523-6709 (Online)

Cite this article as: Sunita Nighute, Kiran Buge, Siva Kumar. Effect of cigarette smoking on peak expiratory flow rate. IJCRPP. 2017;1(1):3-5.

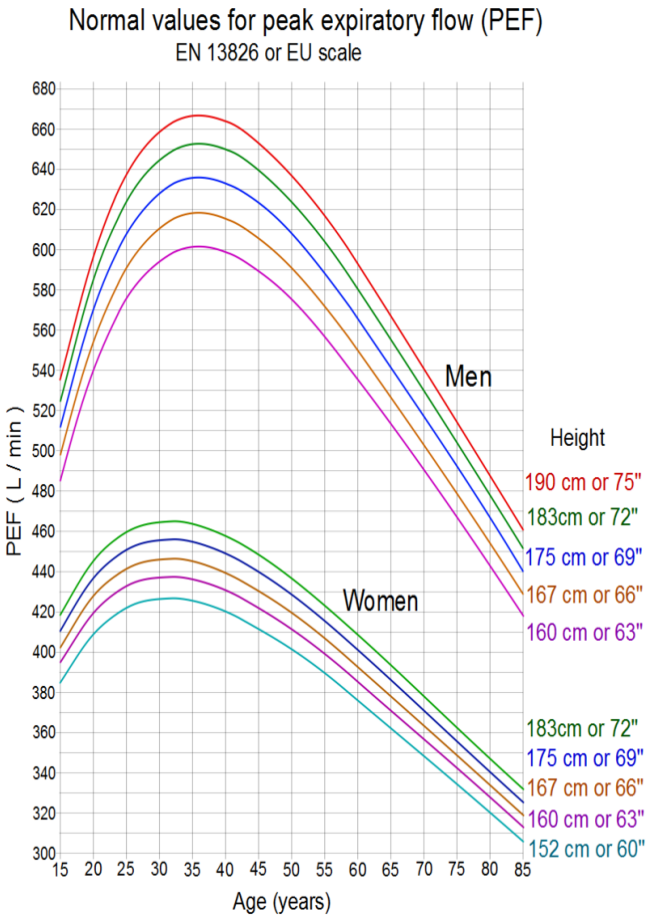

Fig 1: Normal Peak expiratory flow values in men and women

Table 1: Indication zones

Zone	Reading	Description
Green Zone	80 to 100 percent of the usual or normal peak flow readings are clear.	A peak flow reading in the green zone Indicates under good control
Yellow Zone	50 to 79 percent of the usual or normal peak flow readings	Indicates caution. It may mean respiratory airways are narrowing and additional medication may be required.
Red Zone	Less than 50 percent of the usual or normal peak flow readings	Indicates a medical emergency. Severe airway narrowing may be occurring and immediate action needs to be taken. This would usually involve contacting a doctor or hospital.

The highest of three readings is used as the recorded value of the Peak Expiratory Flow Rate. It may be plotted out on graph paper charts together with a record of symptoms or using peak flow charting software. This allows patients to self-monitor and pass information back to their doctor or nurse[25].

Peak flow readings are often classified into 3 zones of measurement according to the American Lung Association; green, yellow, and red. Doctors and health practitioners can develop an asthma management plan based on the green-yellow-red zones[26].

CONCLUSION

PEFR is decreased in cigarette smokers compared to non-smokers and the magnitude of decline is higher in elderly individuals. Smokers even if they are symptom free, have lower values of PEFR than nonsmokers.

Conflict of interest: Nil

Funding : Nil

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