

STUDIES ON THE VENTILATORY FUNCTION AMONG THE ALLIED HEALTH SCIENCES STUDENTS OF BRAINWARE UNIVERSITY, KOLKATA, WEST BENGAL

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ABSTRACT

Peak Expiratory flow rate (PEFR) is one of the important parameter for measuring the ventilatory function of the lungs. In recent years air pollution has become a serious issue which creates respiratory problems in growing population. This value is measured by using peak flow meter. PEFR is directly correlated with sex, height and age. In the present study a general nomogram has been developed for college students of (20±2 yrs) age group in Brainware University. PEFR values are correlated with height and sex. Our analysis has generated a nomogram from which we can easily predict the PEFR values with different Height. This data will help to screen different respiratory disorders like Asthma, COPD and other chronic respiratory problems in future.

KEY WORDS: PEFR, Lung function, Peak flow meter, Nomogram

INTRODUCTION

Effect of pollution on pulmonary function is a serious issue now a days. According to Health on the March report by Government of West Bengal (2015-16) 136846, 184737, 202798 persons are affected in acute respiratory infection in North 24- Parganas in the year 2014, 2015 and 2016 respectively (Health on the March report, 2015-2016, Government of West Bengal). Among them an increased number of deaths have been reported. Simple physiological measurements are useful for measurement of health status in populations. They also have prognostic implications for individual. To assess respiratory problems, lung function tests are essential. For the study of ventilatory functions several investigations can be performed. Among different parameters, Peak Expiratory Flow Rate (PEFR) is a useful parameter to monitor airway obstruction (Paramesh *et al.*, 2003). The result would help to assess severity and variation in lungs. PEFR is the maximum amount of exhaled air during forceful expiration after complete inspiration (De Vrieze *et al.*, 2020).

PEFR result primarily reflects maximum airway flow and depends on the muscular strength during voluntary effort of the subject. PEFR is measured by Peak Flow Meter machine which gives manual reading of PEFR in Litre per minute. This parameter is used for Persons with higher physical disability. Low PEFR indicates poor health (cancer, heart disease, and stroke) (Klein *et al.*, 2001). As a lung function test, it is an essential tool for diagnosis and assessment of prognosis of asthma and Chronic obstructive pulmonary diseases (Hansen *et al.*, 2001).

MATERIALS AND METHODS

In this study for PEFR measurement totals 130 students (Age 20±2 yrs) have been selected from Allied Health Sciences department, Brainware University. Among them 80 are male and 70 female. After routine clinical examination, PEFR has been determined by Wright's Peak Flow meter (Celement Clarke International Ltd.). After three consecutive measurements for 30 seconds apart, the highest reading has been taken for individual subject.

Height is also noted for those subjects.

RESULTS

PEFR determination is considered as useful parameter for assessing respiratory disorders specially bronchial asthma and COPD (Chronic obstructive pulmonary diseases). It is also related to health impact of air pollution. After recording of PEFR, the scores are tabulated in a table. Males and female recordings are separated. A graphical correlation has been made by plotting the values of Height with respect to PEFR values.

Statistical analysis was done by student's t-test.

Figures within the parenthesis indicate the range.

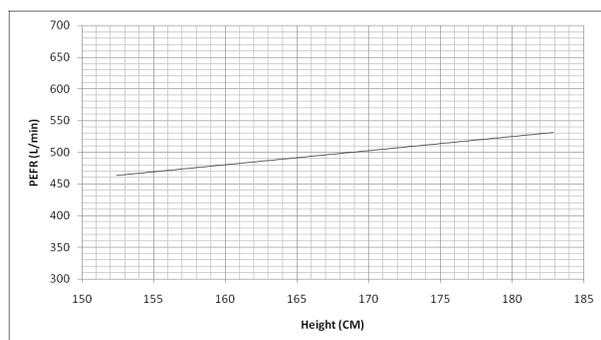


Fig. 1. Nomogram results from PEFR test carried out on male college students (n=80, Age-20Yrs \pm 2) of Allied Health Sciences Department, Brainware University.

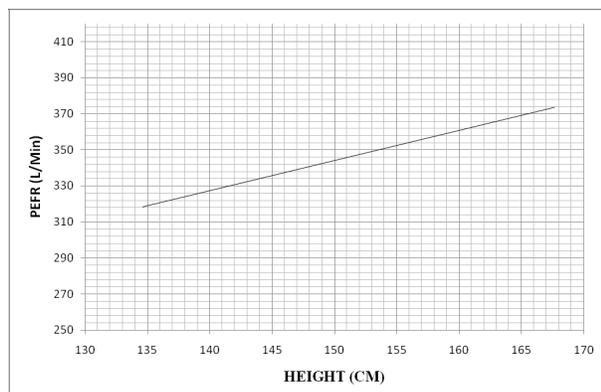


Fig. 2. Nomogram results from PEFR test carried out on female college students (n=50, Age-20 Yrs \pm 2) of AHS department, Brainware University

DISCUSSION

Normal PEFR value depends on several factors like age, sex, height, weight, etc (Thurlbeck *et al.*, 1982).

Table 1. Showing PEFR readings male (n=80) students (20Yrs \pm 2) vs female (n=50) students of Allied Health Sciences Department, Brainware University (P value <0.05).

	Male (n=80) Mean \pm SD	Female (n=50) Mean \pm SD
Age (Years)	20 \pm 2	20 \pm 2
Height (cm)	170 \pm 20	150 \pm 20
PEFR (L/Min)	498 \pm 10 (460-540)	352 \pm 5 (320-375)

So the PEFR value varies in normal individuals and a nomogram is utilized as a scale. In obstructive airways diseases, normal value of PEFR is reduced corresponding to above factors. In this study we want to show a correlation between PEFR values with the height. PEFR value is correlated with height and sex. Our analysis has generated a nomogram from which we can easily predict the PEFR values with different Height. PEFR is also correlated with other standard measures of health status like asthma. The present study disclosed respiratory conditions for students of Allied Health Sciences department. The degree of impairment and number of affected subjects have been small but when other respiratory challenges such as frequent infections under the background of malnutrition and low socioeconomic status which are so common here and tobacco smoking, occupational exposure have altered effects on PEFR (Bellemare *et al.*, 2003).

CONCLUSION

Our study showed that a variability in normal PEFR data among college students (20Yrs \pm 2) of Brainware University. PEFR value depends on sex and height. Also this value is variable in different conditions (age, medication use, and respiratory problems). Peak flow meter is primarily helpful to screen subjects with more unstable Respiratory disorders like bronchial asthma and COPD.

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