Original Article

Assessment of Peak Expiratory Flow Rate in Pakistani Medical Students

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Objectives: To observe the change in peak expiratory flow rate in 1st year to final year medical students.

Methodology: 131 normal, non smoking Pakistani adult (78 males and 53 females) medical students were included in the study. All subjects belonged to Ziauddin Medical College and participated as volunteers. The age of subjects was in between 19 to 24 years. They had no history of any chronic diseases (e.g. tuberculosis, hypertension, diabetes or any surgical deformity) and were not under physical training program and/or any medications. All were informed about the purpose, requirements and the protocol of the investigation.

Results: The PEFR values in male students was found to be higher then the female students when compare according to height and weight. The P value was highly significant in both groups except the group of students who had height range 171-175 cm.

Conclusion: The PEFR in this study was better than the other studies conducted in this region among medical students and students from any other disciplines. (Rawal Med J 2013;38:212-214).

Key words: PEFR, tuberculosis, hypertension, diabetes.

INTRODUCTION

Peak expiratory flow rate (PEFR) is a simple and reliable way of assessment of patients with bronchial asthma and other obstructive airway diseases.[1] It is also used to observe response of a bronchodilator in assessment of asthmatic subjects.[2-4] Serial PEFR is a simple and appropriate method for the diagnosis of occupational asthma and can be used for monitoring patients.[2] It is measured by peak flow meter which was discovered by Wright in the 1950s. The normal range of PEFR is related to factors such as age, gender, height, race, occupation, weight, cigarette smoking and environmental conditions.[4-8]

Medical students of today are the physicians of tomorrow and a good physician must be physically fit and mentally alert. Sound health and physical fitness are positively associated with good mental health and well being. People who take regular physical exercise report less anxiety and depression and lower level of stress as compare to people who have sedentary life style.[1] Buffalo Health Study concluded that pulmonary function is the long term predictor for over all survival rates, in both genders and could be used as a tool in general health assessment.[2, 3] In this study, an attempt has been made to assess pulmonary functions and cardio-respiratory fitness among the medical students.

METHODOLOGY

131 normal, non smoking Pakistani adult students (78 males and 53 females) were taken as participants. All belonged to Ziauddin Medical College, Karachi, Pakistan and participated as volunteers. The age of subjects was in between 19 to 24 years. They had no history of any chronic diseases (e.g. tuberculosis, hypertension, diabetes or any surgical deformity) and were not under physical training program and/ or any medications. All were informed about the purpose, requirements and the study protocol.

All the measurements were scheduled in the morning from 9:00 am to 12:00 noon. Each subject had his/her seated blood pressure, pulse, and O_2 saturation measured and respiratory system examined followed by recording of PEFR. Height without shoes, weight, hip and waist circumference were recorded (minimal height scale was used and

calibrated daily) and chest was examined for evidence of surgery and auscultated for wheeze or crackles.

Peak expiratory flow rate (PEFR) was measured using Peak Flow meter as per standard method.[5, 6] Three readings were taken and the best was recorded.[7] The data was analyzed by SPSS version 14 T test, Pearson correlation coefficient was used for data analysis.

RESULTS

The average PEFR was 439.2±62.3 L/min in males and 354.2±68.5 L/min in females (Table 1). Rate of increase in males was higher than females. The male students showed significantly higher values of PEFR ($P < 0.05$) in comparison to females except in height range of 171-175 cm.

Table1. PEFR (L/min) values for males and females by height range.

Height range (cm)	Males	PEFR L/min	Females	PEFR L/min	P-value
	No	Mean ± SD	No	Mean ± SD	
150-155	6	375 ± 60.2	13	316 ± 55.3	0.001
156-160	5	393 ± 71.1	14	335 ± 61.3	0.001
161-165	8	405 ± 68.4	12	351 ± 65.8	0.014
166-170	22	424 ± 78.3	9	380 ± 68.7	0.002
171-175	19	475 ± 80.1	5	410 ± 75.2	0.475
176-180	14	493 ± 80.6	--	--	--
>=180	4	510 ± 81.2	--	--	--

The PEFR values in relation to gender and weight is presented in Table 2.

As the weight increased, the PEFR also increased more in males as compared to females.

Table 2. PEFR (L/min) values for male and females by Weight range.

Weight range (Kg)	Males	PEFR L/min	Females	PEFR L/min	P-value
	No	Mean ± SD	No	Mean ± SD	
30-39	--	--	5	303 ± 30.3	--
40-49	5	394 ± 35.5	21	329 ± 50.4	0.006
50-59	20	405 ± 55.4	16	351 ± 62.5	0.002
60-69	28	448 ± 67.6	8	369 ± 60.5	0.053
70-79	19	465 ± 73.6	3	381 ± 68.9	0.032
>= 80	6	502 ± 83.6	--	392 ± 76.2	0.004

The p value was significant in all weight ranges.

DISCUSSION

PEFR is an accepted index of pulmonary function and is widely used in respiratory medicine.[8] Serial PEFR monitoring is a convenient method in investigation and diagnoses of occupational asthma.[9-11] There are many biologic sources of variation in pulmonary function. Intra individual variation may be attributed to body position, head position, effort dependency of maximum flow and circadian rhythm. Intra individual variability may be due to a variety of host factors, including size (height, weight), age, race, past and present health. Geographic factors, exposure to environmental and occupational pollution and socioeconomic status may also influence intra individual variation.[12]

In our study, PEF was related to age, weight and height, and perhaps its relation to weight is due to the higher height with increased weight. Our findings were higher than those reported from Nepali medical students[13] and non medical students in of Iran, Kashmir and Nigeria.[14-16]

CONCLUSION

PEFR in the present study was better than other studies reported from this region both in medical and nonmedical subjects. It is might be due to more health awareness of medical students, balanced nutrition and difference in socioeconomic status.

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