

Peak Expiratory Flow Rate in Healthy Pakistani Adults

Pages with reference to book, From 363 To 364

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Abstract

Peak expiratory flow rates (PEFRs) were measured in 424 healthy subjects (213 males and 211 females) from Karachi and Rawalpindi regions of Pakistan. The mean age, height and peak expiratory flow rate for males were 32.82 ± 10.52 yr, 163.5 ± 5.4 cm and 478.6 ± 63.2 l/min respectively. The corresponding values for females were 35.54 ± 6.98 yr, 157.34 ± 8.2 cm and 422.5 ± 42.6 l/min respectively. Body height was found to have a positive correlation with PEFR (JPMA:- 34: 363 1984).

Introduction

Peak expiratory flow rate (PEFR) recorded on Wrights peak flowmeter is commonly used for screening individuals with chronic airway obstruction both in clinical and in field studies. For the assessment and follow up of bronchial asthma PEFR is a reliable parameter. Predicted normal values for PEFR have been shown to have significant geographical and ethnic variation. The present study was carried out to collect data with regard to normal values of PEFR in healthy Pakistani adults. PEFRs have been reported by various workers in different countries¹⁻⁴ but no such study has been reported, for this particular geographical region of the world.

Material and Methods

The study was carried out on healthy males and females, from Karachi and Rawalpindi regions. All subjects denied having a history of asthma, atopic phenomena, chronic bronchitis or recent upper respiratory tract infection. None of the subjects had been a regular smoker.

PEFR was recorded with a properly calibrated Wright's peak flowmeter. Before the test, the purpose and technique of measurement were explained to each subject and they were given sufficient practice in the use of the instrument. In each case three satisfactory readings were taken, and the highest figure of PEFR, was taken as the representative value for a given individual. Height was measured in the standing position without shoes and the weight was recorded. The data was subjected to standard statistical analysis and regression equation for PEFR was obtained by method of least square deviation.

Results

A summary of the data collected from 424 subjects including 213 males and 211 females for this study is given in Table 1.

Table I Age-wise Distribution of Height and Peak Expiratory Flow Rate.

Age (Years)	No. of subjects	Male		No. of subjects	Female	
		Height cm Mean SD	PEFR ℓ /min Mean SD		Height cm Mean SD	PEFR ℓ /min Mean SD
(16 – 20)	28	165.3 $\pm$ 4.2	405.0 $\pm$ 48.0	26	157.5 $\pm$ 3.4	342.4 $\pm$ 42.5
(21 – 25)	26	169.5 $\pm$ 5.1	513.0 $\pm$ 62.0	28	160.3 $\pm$ 4.1	442.3 $\pm$ 58.2
(26 – 30)	27	169.19 $\pm$ 6.4	420.5 $\pm$ 45.6	26	161.3 $\pm$ 5.7	368.0 $\pm$ 48.6
(31 – 35)	26	168.5 $\pm$ 6.2	445.0 $\pm$ 57.0	25	159.5 $\pm$ 6.4	384.5 $\pm$ 54.5
(36 – 40)	26	169.3 $\pm$ 4.5	463.5 $\pm$ 39.4	26	158.6 $\pm$ 5.4	406.4 $\pm$ 62.4
(41 – 45)	26	166.4 $\pm$ 4.8	472.6 $\pm$ 71.2	27	158.4 $\pm$ 5.2	424.0 $\pm$ 44.6
(46 – 50)	27	172.3 $\pm$ 3.2	482.00 $\pm$ 28.4	27	159.0 $\pm$ 5.4	418.5 $\pm$ 36.2
(51 & Over)	27	170.6 $\pm$ 5.2	485.6 $\pm$ 68.2	26	158.0 $\pm$ 5.0	436.2 $\pm$ 62.4
Total	213			211		

The mean age, height and peak expiratory flow rates (PEFRs) for male group are shown in Table II.

Table II
Mean Age, Height and PEFRs in Healthy Pakistani Adults.

	Age	Height	PEFR ℓ /min
Males	32.8 $\pm$ 10.5 yr	163.5 $\pm$ 5.4 cm	478.6 $\pm$ 63.2
Females	35.54 $\pm$ 6.98 yr	157.34 $\pm$ 8.2 cm	422.5 $\pm$ 42.6

The regression equation to predict PEFR based on age and height is shown in Table III.

Table III

**Regression Equation for Peak Expiratory Flow
Rate (PEFR) for Healthy Pakistani Adults.**

$\text{PEFR (}\ell/\text{min)} = b_0 + b_1 \text{ age} + b_2 \text{ age}^2 + b_3 \text{ height (cm)}$		
Coefficient	Males	Females
b_0	-39.52	462.73
b_1	5.42	-2.51
b_2	-0.841	0.0544
b_3	3.41 cm	2.74cm
SEE	64.2 ℓ /min	45.6 ℓ /min

Discussion

The PEFRs recorded in the subjects were standardized for age and height. The regression of PEFR over age revealed a curvilinear relationship between age and PEFR. A similar curvilinear relationship between age and PEFRs was reported by other workers^{5,6} The results of a study, reported earlier by us⁷ also indicate the same relationship between age and PEFRs.

A linear relationship is observed between height and PEFRs. This fact concludes that tall, broad and muscular subjects have higher values of PEFRs than thinly built short individuals.

Variation between males and females for PEFRs is shown in a number of studies, The results of few of these are compared with the present study in Table IV.

Table IV
Comparative State of PEFs in Different Studies.

References	Place of study	Predicted values of PEFs $\ell/\text{min.}$	
		Males	Females
Leiner et al.	U.S.A.	520	414
Gregg & Nunn	England	524	395
Malik et al.	India	470	323
Present study	Pakistan	478	422

The findings of this study provide the baseline data for PEFs in normal Pakistani adults and it is expected that it will be of some help to establish normal values of PEFs in previously untested groups of experimental and clinical conditions.

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