



# Study of Absolute Eosinophilic count and peak Expiratory flow rate in Smokers – Retrospective Study

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## Abstract

**Background:** Smoking causes decrease in lung function test and smokers develop respiratory impairment. Hence an effect of smoking on PEFr and absolute eosinophil count is studied.

**Method:** 60 male and 30 female smokers aged between 25 to 40 years were studied. Apart from routine blood examination Absolute eosinophilia count was studied in each patient, spirometer was used to record peak expiratory flow rate.

**Results:** Heart rate, SBP, DBP, PEFr and absolute Eosinophilic count were compared in both sexes and observed significant P value ( $p < 0.001$ ) in every parameters. The correlation of mean values between heart rate and PFR, PEFr and Eosinophilic, count, PEFr and SBP, PEFr and DBP had also significant differences in both sexes.

**Conclusion:** This comparative study between PEFr and Absolute eosinophilia in both sexes will help the Pathologist, physician to treat such smokers efficiently so that they can regain their health and lead normal life by avoiding smoking.

**Keywords:** PEFr, DBP, SBP, AEC, Spirometre, Heart rate

## Introduction

As per WHO reports 5 million people die every year across the globe due to smoking <sup>(1)</sup>. The lung functions of smokers showed accelerated decline <sup>(2)</sup>. Peak expiratory flow rate (PEFR) is an ideal parameter for detecting patients with COPD and test of PEFr reflect changes in air way calibre<sup>(3)</sup>. Air flow obstruction in smokers is often diagnosed relatively late earlier detection of air flow obstruction and smoking cessation may result in significant health gain <sup>(4)</sup>. Peripheral blood eosinophilic has generally being regarded as an allergic trait. Smokers also suffer from difference type's allergic symptoms induced by tobacco which may cause eosinophilia. Hence attempt is made evaluate absolute eosinophilic count in smokers by using PEFr so that, such smokers can be treated and regain the health.

## Material and Method

60 Males and 30 females aged between 25 to 40 years visiting to Medicine department Sathya Sai Medical College and research institute hospital Tiruporur, Chengalpeth, (Taluk), Kanchipuram (dist) Tamil Nadu were studied.

**Exclusion Criteria:** Patients having bronchial asthma, type-II DM, PT cardiovascular diseases were excluded from the study.

**Methods:** Routine blood examination was done Eosinophilic count was done by standard procedure of eosin and haematoxylin staining method, using WBC pipette Turk's fluid and Neubauer's counter chamber PEFr was measured by computerised spirometre (RMS Helios 401 Recorders and Medicare system Pvt. Ltd), the pulmonary function test was recorded. The subjects were made to sit in high sitting position and asked to relax for 5-10 minutes. Soft nose clips were used to prevent air escaping through nose sterile filter mouth piece were used to prevent the spread of micro-organism. Rapid breaths in (forced inspiratory part) would come, before the forced exhalation. The patient was asked to take deep breath as forcefully they can; PEFr values were recorded from computerized spirometric chart. Moreover their blood pressure also recorded in both sexes.

The duration of study was May-2013 to June-2015.

**Statistical analysis:** Parameters of both sexes were with Z test and noted. The statistical data was performed in SPSS software.

### Observation and Results

**Table-1:** Heart rate 82.60 (SD±1.60) in females t test was -12.5 p value (p<0.001).

SBP (systolic Blood Pressure) 121.20 (SD±4.60) in males, 120.40 (SD±2.12) in females t test was 1.12, (p<0.002) p value was highly significant.

DBP (Diastolic Blood Pressure) 75.30 (SD±2.18) in male, 73.90 (SD±2.12) in females t test 3.45 p value is significant (p<0.004)

PEFR (Peak Expiratory Flow Rate) 0.46 (SD±0.01) in males, 0.04 (SD±0.01) in females t test 3.22 p value is highly significant (p<0.001).

Esinophilic count 549 (SD±5.50) in males, 405 (SD±2.33) in females t test 65.8, p<0.000 (p value was highly significant)

**Table – 2:** Mean values of correlation between Heart rate and PEFR -0.10 in males 0.36 in females PEFR and Esinophilic count 0.12 in males, 0.29 in females PEFR and SBP 0.12 in males, 0.06 in females, PEER and DBP 0.15 in males, 0.22 in females.

### Discussion

Present study of AEC and PEFR in smoker's Heart rate 82.6 (SD±1.30) in males, 86.8 (SD±1.60) in females t test -12.5 p<0.001 SBP 121.2 (SD±504.60) in males, 120.4 (SD±2.12) in females t test 1.12 p<0.002, DBP 75.3 (SD±2.18) in males, 73.9 (SD±1.60) in females t test 3.45 p<0.004, AEC 549.4 (SD±5.50) in males, 405.4 (SD±2.53) in females t test 65.8 p<0.000 (Table-1) Correlation of mean values between heart rate and PFR -0.10 in males, 0.36 in females. PEFR and Esinophilic count 0.12 in male, 0.29 in female, PEFR and SBP 0.12 in males, -0.06 in females, PEFR and DBP 0.15 in males, 0.22 in females (Table-2). These findings are more or less in agreement with previous studies <sup>(5)(6)(7)</sup>.

In the present study mean values of heart rate 82.60 (SD±1.30) in males and 86.8 (SD±1.60) in females which significant ( $p < 0.001$ ), It could be due to reduced size of blood vessels that increases the heart rate and PEFr also 0.46 (SD±0.01) in males, 0.04 in females with significant p value ( $p < 0.001$ ) was due to respiratory impairment because smokers has reduced lung size and reduced functional activity <sup>(8)(9)</sup>. There was marked elevation of AEC in smokers in both sexes with significant increase of PEFr because raised eosinophilic count impairs the pulmonary functions. This impairment of pulmonary function may be reversible or in severe cases irreversible <sup>(10)</sup>. The close association of esinophilic leukocytes with allergy, broadly conceived, is impressive. Hence esinophils correlate with one form of allergy or another. The esinophils from blood come from the marrow. Those in the tissue come from blood.

Variations in PEFr could be due to collapse of alveoli. It can occur in a localized area of lung in an entire lobe or in an entire lung. In majority of cases the obstruction in the air way are due to lack of surfactant cells (phenotype-I, II cells) fluids in the ling alveoli in smokers in both sexes.

### **Summary and Conclusion**

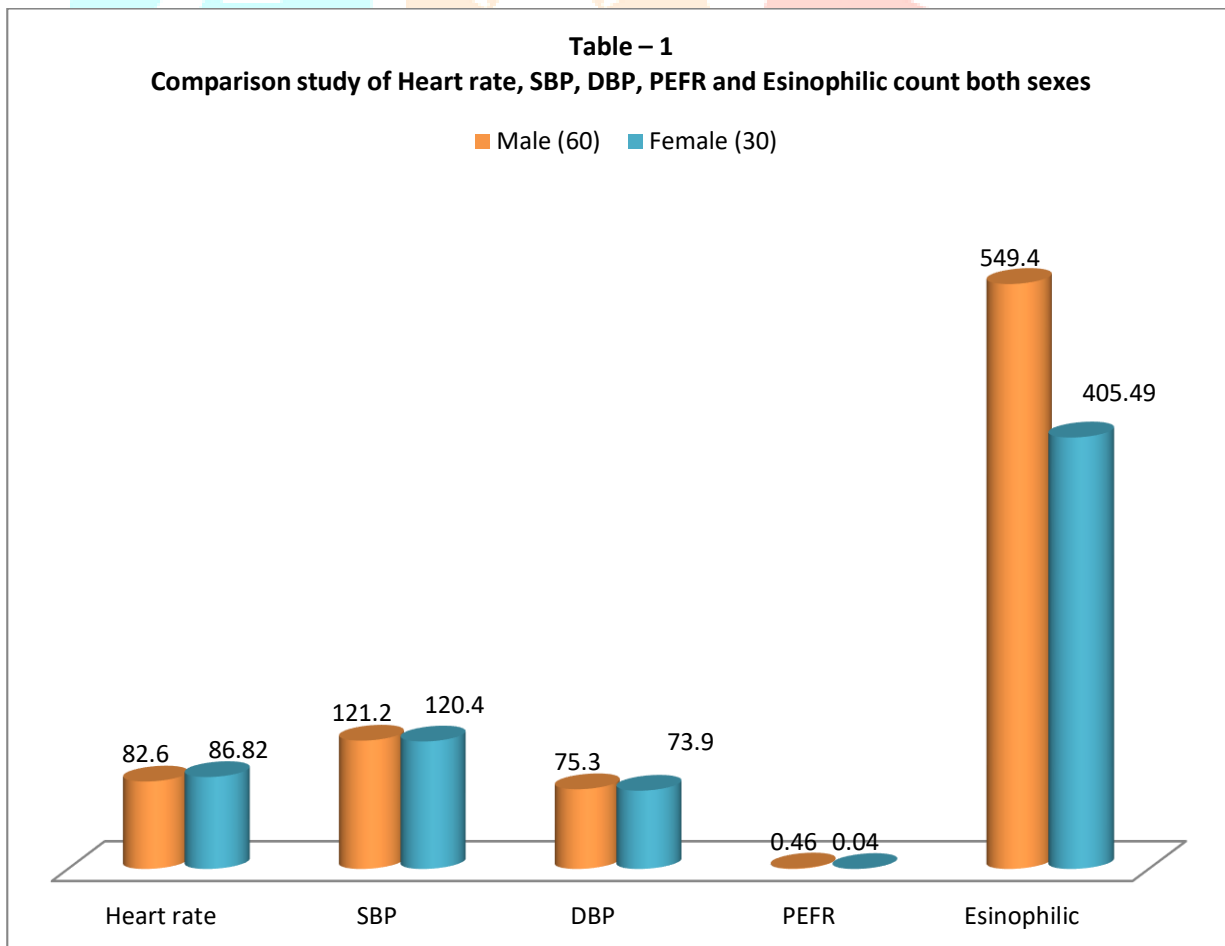
The present study of AEC and PEFr in smokers will be tool for physician to treat such patients efficiently moreover he can predict the prognosis the disease but this study demands further genetic, immunological, patho-physiological, nutritional study because exact role of esinophils in allergic immunological reactions are still un-clear.

**Table – 1****Comparison study of Heart rate, SBP, DBP, PEFR and Eosinophilic count both sexes**

		Heart rate	SBP	DBP	PEFR	Eosinophilic
Male (60)	Mean	82.60	121.20	75.30	0.46	549.40
	SD	(SD±1.30)	(SD±4.60)	(SD±2.18)	(SD±0.01)	(SD±5.50)
Female (30)	Mean	86.82	120.40	73.90	0.04	405.49
	SD	(SD±1.60)	(SD±2.12)	(SD±1.60)	(SD±0.01)	(SD±2.33)
t test		-12.5	1.12	3.45	3.22	65.8
p value		P<0.001	P<0.02	P<0.004	P<0.001	P<0.000

SBP = systolic Blood pressure, DBP= Diastolic Blood

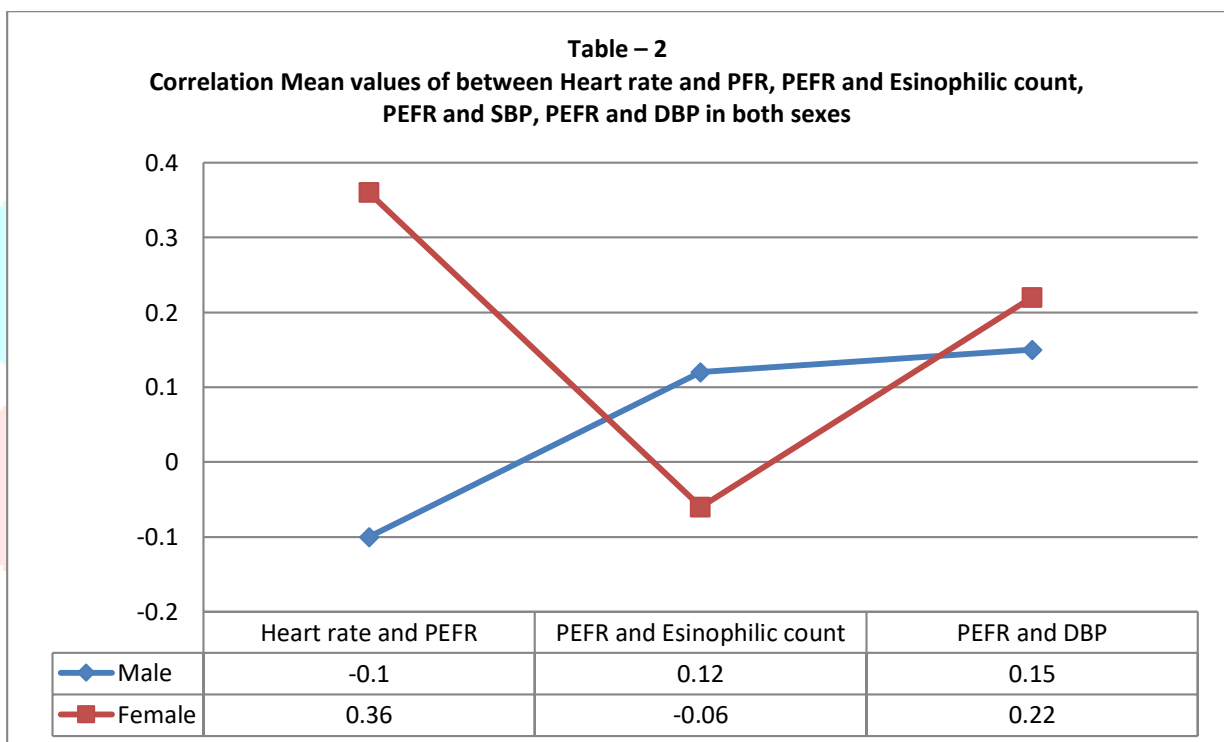
PEFR = Peak expiratory flow rate pressure



**Table – 2**

**Correlation Mean values of between Heart rate and PFR, PEFR and Esinophilic count, PEFR and SBP, PEFR and DBP in both sexes.**

Correlation	Male Mean	Female
Heart rate and PEFR	-0.10	0.36
PEFR and Esinophilic count	0.12	-0.06
PEFR and DBP	0.15	0.22



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