

STUDY OF ABSOLUTE EOSINOPHIL COUNT AND PEAK EXPIRATORY FLOW RATE IN SMOKERS IN RURAL TAMILNADU

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ABSTRACT

Background: In smokers, raised Absolute eosinophil counts are due to allergic manifestations caused by antigen-antibody complexes or histamine, which impairs the pulmonary functions and leads to considerable variations in peak expiratory flow rate (PEFR) in both sexes. **Materials and Methods:** 120 male and 15 female smokers aged between 25 to 40 years were studied. Apart from routine CBC examination, Absolute eosinophil count was studied in each patient, and a spirometer was used to record their peak expiratory flow rate. **Result:** Heart rate, PEFR, Absolute eosinophil count, systolic and Diastolic blood pressure were compared in both sexes, and a significant P value ($p < 0.001$) was observed in every parameter. The correlation of mean values between heart rate and PEFR, PEFR and Absolute eosinophil count, PEFR and SBP, and PEFR and DBP also had significant differences in both sexes. **Conclusion:** This comparative study between PEFR and Absolute eosinophilia in both sexes will help the pathologist and physician to treat such smokers efficiently so that they can regain their health and lead normal lives by avoiding smoking.

INTRODUCTION

The main aim of smokers' guidelines is to provide an evidence-based approach to assist health professionals for their respiratory (asthma) management. Exacerbations are important, as they cause anxiety to patients and are associated with health care cost.^[1]

Traditional objective methods used to monitor (but not control) include indices of spirometry/peak flow and airway hyper responsiveness. Newer methods include measurement of airway inflammation, such as cellularity in induced sputum or fractional exhaled nitric oxide (FENO), as phenol/endo types of smokers' asthma are increasingly appreciated.^[2]

The close association of eosinophils with allergy broadly conceived, is impressive. Allergic disorders like bronchial asthma, hay fever, angioneurotic edema, urticaria, and erythema multiforme are characterized by eosinophilia.^[3] Eosinophils are found in peripheral blood, marrow, sputum (bronchial asthma), nasal and conjunctival discharge (in hay fever), and urticarial skin lesions and vesicles.^[4] In smokers, raised eosinophilic counts are due to allergic manifestations caused by antigen-antibody complexes or histamine, which in turn

causes airway inflammation and impairs pulmonary functions. This leads to considerable variations in peak expiratory flow rate (PEFR) in both sexes. Hence, an attempt is made to study both the Absolute eosinophil count and the peak expiration flow rate of respiration in both sexes.

MATERIALS AND METHODS

120 males and 15 females aged between 25 to 40 years visiting the Respiratory medicine OP department of JR Medical College and Hospital, Avanampattu, Tamil Nadu-604302, were studied.

Inclusion Criteria: Chronic and chain smokers, patients with difficulty in respiration, and patients who gave their consent in writing for the study were selected.

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

Methods: A complete blood count (CBC) testing was done using automated hematology Analyzer. The Absolute eosinophil count values derived from the analyzer is also confirmed by Peripheral smear examination. PEFR was measured by computerized spirometer (RMS Helios 401 Recorders and

Medicare System Pvt. Ltd.), and the pulmonary function test was recorded. The subjects were made to sit in a high sitting position and asked to relax for 5-10 minutes. Soft nose clips were used to prevent air escaping through the nose, and sterile filter mouthpieces were used to prevent the spread of microorganisms. Rapid breaths in (forced inspiratory part) would come before the forced exhalation. The patient was asked to take a deep breath as forcefully

as they can; PEFR values were recorded from a computerized spirometry chart. Moreover, their blood pressures were also recorded. The duration of the study was April 2024 to April 2025.

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

RESULTS

Table 1: Comparison of Heart rate, Blood pressure, PEFR and Absolute Eosinophil count (AEC) in both sexes.

		Heart rate	SBP	DBP	PEFR	AEC
Male	Mean ($\pm$ SD) (90)	82.62 (SD $\pm$ 1.28)	121.18 (SD $\pm$ 1.30)	75.28 (SD $\pm$ 2.18)	0.45 (SD $\pm$ 0.01)	548.80 (SD $\pm$ 4.30)
Female	Mean ($\pm$ SD) (45)	86.84 (SD $\pm$ 1.58)	120.38 (SD $\pm$ 2.10)	73.85 (SD $\pm$ 1.50)	0.04 (SD $\pm$ 0.01)	406.48 (SD $\pm$ 2.30)
t test		16.6	2.72	3.95	2.35	20.7
p value		P<0.001	P<0.001	P<0.001	P<0.001	P<0.001

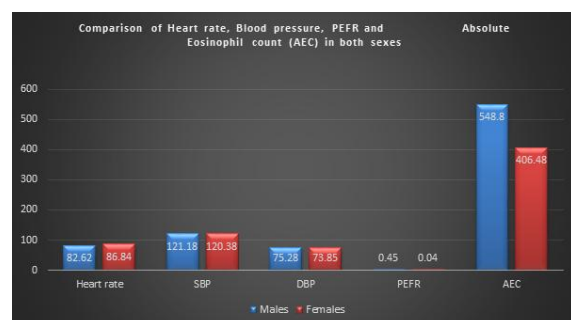
SBP = systolic Blood pressure,

DBP= Diastolic Blood pressure

PEFR = Peak expiratory flow rate

Table 2: Correlation Mean values of between (1) Heart rate and PEFR, (2) PEFR and Absolute Eosinophil count, (3) PEFR and SBP, (4) PEFR and DBP.

Correlation between	Male (120)	Female (15)
Heart rate and PEFR	-0.11	0.38
PEFR and AEC	-0.12	-0.27
PEFR and SBP	0.11	-0.04
PEFR AND DBP	0.13	0.22



Comparison of Heart rate, Blood pressure, PEFR and Absolute Eosinophil count (AEC) in both sexes.

CONCLUSION

The present study of AEC and PEFR in smokers will be a tool for physicians to treat such patients efficiently; moreover, they can predict the prognosis of the disease, but this study demands further genetic, immunological, pathophysiological, and nutritional study because the exact role of eosinophils in allergic immunological reactions is still unclear.

Limitation of study: Owing to remote location of research Centre, a smaller number of patients, lack of

latest techniques we have limited findings and results.

1. This research work was approved by ethical committee of JR Medical College and hospital, Avanampattu Tindivanam Taluk, Vallupuram, Tamil Nadu-604302
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