



PEAK EXPIRATORY FLOW RATE IN NON-PREGNANT WOMEN, POST-PARTUM WOMEN AND PREGNANT WOMEN – A COMPARATIVE STUDY

**SAROJ
CHOUDHARY**

Senior Demonstrator, Department of Physiology, GMCH, Udaipur, Rajasthan, India.

***ABHISHEK
ACHARYA**

Senior Demonstrator, Department of Physiology, RNT Medical College, Udaipur, Rajasthan, India. - Corresponding author

ABSTRACT Peak expiratory flow rate (PEFR) is one of the important pulmonary function tests to study the expiratory effort and also the functioning of the respiratory muscles. During pregnancy, a woman's body undergoes changes including biomechanical, physiological, and metabolic. Hence the present study has been conducted to compare the Peak expiratory flow rate in Non pregnant women, Post-partum Women and Pregnant women (second trimester). This study was carried upon 45 women in the age group of 18-35 years. The subjects were divided into three groups i. e, Group I- 15 pregnant women (second trimester), Group II- 15 Non-Pregnant Women and Group III- 15 Post-Partum Women. Well functioning mini Wright peak flow meter (mWPFM) was used to record PEFR. In our study the significantly higher PEFR was found in group II (Non pregnant women) followed by group III (Post partum women) and then group I (Pregnant women in second trimester).

KEYWORDS : Peak expiratory flow rate, Pregnant women, Non pregnant women and Post partum women.

INTRODUCTION

Peak expiratory flow rate measurement gives the idea of status of airway calibre of respiratory system and regulatory function of respiration which some time affected by certain progressive neurological disease. Pulmonary function tests of various types are utilized clinically and epidemiologically to measure functional status in order to assess the disease.¹ Though they do not provide a specific diagnosis, they help us to understand the physiology, course and progress of the respiratory diseases, assess the severity and help in the management of number of respiratory diseases.²

Thus this information can gain by monitoring peak expiratory flow rate which provide an objective measurement of air flow obstruction.³ During normal pregnancy respiratory performance is affected indicated by alteration in lung volume and capacities.⁴

PEFR <80%, it indicates pulmonary function are compromised. Likewise, the respiratory functions in various stages of pregnancy as well as in postnatal period are monitored and compared. There are anatomical changes like enlargement of uterus, elevation of diaphragm and physiological changes like increase in progesterone and estrogen level occur in course of pregnancy and advancing gestation that affects PEFR.

It was observed that due to mechanical effects, progressively increased size of uterus decrease lung volume and capacities by 5th month. So, present study is aimed to see whether PEFR will be altered in Second trimesters of pregnancy.

MATERIAL AND METHOD

This cross sectional prospective study was conducted in Department of Physiology and Department of Gynecology & Obstetrics Shrimati Heera Kunwar Baa Mahila Hospital, Jhalawar Medical College, Jhalawar. The subject was selected from of O.P.D. and I.P.D. Department of Gynaecology and Obstetrics.

DISTRIBUTION OF SUBJECTS

Group I- 15 pregnant women (second trimester)

Group II- 15 Non-Pregnant Women.

Group III- 15 Post-Partum Women.

The nature and purpose of the study was explained to the subjects who were volunteer for study. A Performa was used to record the relevant information from each selected individual who were included. The subjects who have exclusion criteria were dropped from study. A thorough physical & systemic examination of each subject will be done.

Well functioning mini Wright peak flow meter (mWPFM) was used to record PEFR. Before asking to perform peak flow, subject was demonstrated how to use mWPFM correctly. For each determination the subject was instructed to make a maximum inspiratory effort and then to make the maximum and most rapid expiratory effort possible in sitting position.

Inclusion criteria-

- Age group : 18-35 years
- Non-tobacco users.
- Multipara (2 kids).
- Normal cardio respiration status
- Apparently healthy subjects were in study.
- Adequately co-operative.

Exclusion criteria-

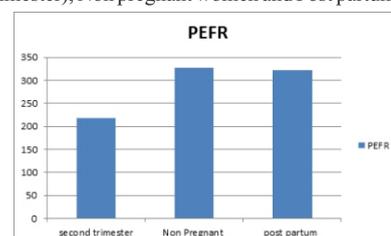
- Subject with acute and chronic infection in last three months .
- H/o cardio pulmonary disease
- H/o diabetes mellitus.
- Alcohol intake.
- Tobacco consumption.
- Obese/ underweight.
- H/o thoracic deformity or ARI with in two weeks.

Statistical Analysis

The data were expressed as mean±SD. Statistical analysis were performed according to an intention to treat strategy. the One Way ANOVA test was used to compare the differences. Analysis was performed by using SPSS version 6.0 computer software.

Groups	PEFR Mean±S.D	F value	P value
Pregnant women (Second trimester)	218.7 ± 20.66	143.3	<0.0001
Non pregnant women	328 ± 17.4		
Post partum women	322.7 ± 21.54		

Table-1 showing comparison of Mean value between pregnant women (Second trimester), Non pregnant women and Post partum women



Graph-1 showing Mean value of pregnant women (Second trimester), Non pregnant women and Post partum women

RESULT

In our study there was significant variation in PEFR in different Groups ($p < 0.0001$) shows in Table 1 and Graph-1. The mean PEFR in Second Trimester Pregnant Women was 218.7, in Non-Pregnant Women 328 and in Post-Partum Women 322.7. The higher PEFR was found in group II (Non pregnant women) followed by group III (Post partum women) and then group I (Pregnant women in second trimester). We found that lesser value of PEFR in Pregnant Women (second trimester). PEFR in Post-Partum women is higher than the Pregnant women but lower than the Non- Pregnant Women.

DISCUSSION

Pregnancy and advancing gestation has been associated with physiologic changes in ventilatory function.^{5,7} Although these changes are well tolerated, prompt recognition and treatment of altered respiratory function is needed to protect the health of the mother and fetus.⁸ Peak expiratory flow rate can provide this simple routine assessment of ventilatory function in pregnancy.⁹

In our study, the PEFR in pregnant women (second trimester) was less than that in Non-Pregnant Women and Post-Partum Women. There was highly significant difference ($p < 0.0001$) between non pregnant women group and pregnant women group in our present study shows in table 1 and graph 1 because in the later months of pregnancy causes elevation of diaphragm (4cm) and due to lesser force of contraction of main expiratory muscles like anterior abdominal wall muscles and internal intercostals muscle, decrease was attributable to the decline in alveolar P_{CO_2} which act as bronchoconstrictor and decline in PEFR could be due to increased progesterone in blood affecting expiratory muscles.

Similar findings were reported by Singhal and Saxena¹⁰ and Harirah et al.¹¹ A descending trend in PEFR at different trimesters was observed by Chaitra and Maitri.¹² The decrease in the mean PEFR may be attributed to lesser force of contraction of expiratory muscles (i.e., anterior abdominal muscles) or to mechanical effect of enlarging gravid uterus, decreasing the vertical diameter by restricting the diaphragmatic movement.

CONCLUSION

In our study we concluded that the higher PEFR was found in Non pregnant women followed by Post partum women and then Pregnant women in second trimester. We found that lesser value of PEFR in Pregnant Women in second trimester as compared to Non-pregnant and Post-Partum women.

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