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EVALUATION AND COMPARISON OF LUNG FUNCTION PARAMETERS DURING PREGNANCY

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ABSTRACT

Aim: The study was aimed to evaluate and compare the pulmonary function in pregnant South Indian women at 36weeks and at full term of pregnancy.

Methodology: A total 60 pregnant women were assigned to two groups: study group I: 36weeks (30 nos) and study group II: full term pregnancy (30 nos) antenatal cases recruited from women who visited the OBG Dept. of PESIMSR hospital, during the period 2008-2009. Inclusion criteria were: healthy pregnant women with age group of 20-40 yrs and Exclusion criteria included, smokers, pre-eclampsia, hypertension, diabetes. Baseline pulmonary functions were recorded with a computerized spirometer "Winspiro". The pulmonary function parameters evaluated were FEV₁, FVC, FEV₁/FVC, FEV_{25-75%}, PEF AND MVV. Statistical analysis was done by "t" test method with SPSS software.

Results: All the pulmonary function parameters were increased except PEF in group II as compared to group I but this was not statistically significant. The PEF was increased in group II as compared to group I and this was statistically significant.

Conclusion: The PEF was increased significantly in 36 weeks pregnancies, and should be interpreted carefully in pregnant women.

Keywords: Pregnant women, pulmonary function, spirometry

INTRODUCTION

Pregnancy manifests as one of the most remarkable states of physiological adaptations. The changes of cardiovascular, hematological, hormonal, metabolic and excretory function during pregnancy have been studied in detail¹. Changes in respiration are sparsely reported². The conclusion of earlier studies on pulmonary functions test (PFT) during pregnancy showed conflicting results. Studies have reported that increased in vital capacity of the lung during pregnancy but on the other hand few authors' have observed there is decrease³ or remains unchanged⁴. Studies have also observed changes of pulmonary function on

different women⁵ and each trimester during pregnancy⁶. Many studies have been reported changes of lung function during pregnancy in western population as well as Indian population, however to be appear less consistent⁷. The present study was aimed to evaluate and compare the pulmonary function test values at 36 weeks pregnancy and full term pregnancy.

MATERIAL AND METHODS

A total of 60 healthy pregnant women with age (20-40) who visited the OBG department of PESIMSR Hospital, Kuppam, during the period 2008-2009 were enrolled after approval from

institutional ethics committee and written consent was obtained. The subjects grouped under: Group-I: 30 subjects at 36 weeks pregnancy. Group-II: 30 subjects at full term pregnancy. Care was taken to exclude those suffering from pre-eclampsia, smoking, hypertension, diabetes, any disease of chest or with recent history of illness. Details of family history regarding presence of pulmonary disease like bronchial asthma, tuberculosis were asked and such individuals were also excluded. Anthropometry was done in each subject age, height in cm, weight in kg. Pulmonary function tests were performed by using Win Spiro, which is a Pc based spirometer with flow transducer. Parameters studied included, forced vital capacity (FVC), forced expiratory volume in one second (FEV1), FEV1/FVC, peak expiratory flow rate (PEFR), forced expiratory flow (FEF25%-75%) and maximum voluntary volume (MVV). Discrete explanation and demonstration of each test was given to the each subjects. All tests were carried out with the subjects in sitting position and. Three trials were performed on the subjects; the best value was taken for analysis and reported and each subject was asked to relax 5 minutes before performing the procedure of PFT.

Statistical analysis

The data was compared and analyzed by using 't' test with software SPSS 20 version. P value <0.05 was accepted as significant difference.

RESULTS

Table 1 shows demographic profile of study group I and study group II. There is increase in age and weight in the study group I as compared to study group II which is statistically significant.

Table II shows pulmonary function parameters of study group I and II. There is a slight but not statistically significant increase in most of values except PEFR in study group II as compared to group I. The PEFR is increased statistically significant in study group II as compared to group I.

DISCUSSION

In the present study it was observed that most of the pulmonary function parameters, except PEFR, were increased at full term as compared to 36 weeks pregnancy, but this was not statistically significant. The slight increase in FEV₁ (L), FVC (L), FEV₁/FVC, MVV (L) and FEF 25-75% in full term pregnancy may be explained because of the downward movement of the uterus, as the head of the fetus gets engaged. It is commonly observed that the dyspnoea seen in the 3rd trimester of pregnancy disappears near full term. This finding consistent with other authors^{8,9}.

PEFR was significantly increased in full term pregnancy as compared to 36 weeks pregnancy. As PEFR is muscular element it could be due to downward displacement of diaphragm at full term pregnancy. This finding in agreement with other researchers¹⁰. At the same time authors have found that PEFR declines throughout pregnancy^{6,7,11}. One study did not find any significant change⁴. In current study most of the values are in accordance with other Indian authors. However a detailed study in more subjects will probably better elucidate changes in pulmonary function. Further study in this area is required to come to an appropriate conclusion.

CONCLUSION

Current study has put effort to evaluate and compare the lung function during 36 weeks and full term pregnancy. A cleared knowledge of PFT during this stage of pregnancy allows the clinician to verify the adaptation in pregnant women and it helps to interpreted whether physiological or pathological changes.

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Table-I: Anthropometry of study group-I and study group-II

PARAMETERS	STUDY GROUP I (36WEEKSPREGNANCY)	STUDY GROUP II (FULLTERM PREGNANCY)	P value
Age (yrs)	23.93 ± 2.44	26.17 ± 3.15	.000*
Height(cm)	153.16 ± 5.54	154.53 ± 5.34	.351
Weight(kg)	55.70 ± 6.01	62.00 ± 8.85	.002*
BMI	23.87 ± 3.60	26.00 ± 3.79	.035

Values expressed are mean±standard deviation (SD)* = p value < 0.05 and considered to be significantly different.

Table II: Comparison of pulmonary function tests in study group I and study group II

PARAMETERS	STUDY GROUP I (36WEEKS REGNANCY)	STUDY GROUP II (FULLTERM PREGNANCY)	P VALUE
FEV1 (L)	2.02 ± 0.367	2.00 ± 0.419	0.865
FEV1/FVC %	86.5 ± 10.8	90.8 ± 12.6	0.159
MVV (L/m)	42.42 ± 22.60	47.25 ± 30.08	0.876
PEFR (L/s)	3.73 ± 0.913	5.064 ± 1.683	0.001*
FEF25-75% (L/s)	76.40 ± 31.1	88 ± 31.8	0.060
FVC (L)	2.23 ± 0.510	2.30 ± 0.401	0.531

Data expressed are mean±standard deviation (SD). * = pvalue < 0.05 and considered to be significantly different.