Results

RESULTS

The data obtained in the present study which were carried out on 150 pregnant women at their mean 32 weeks gestation and 6 months postpartum, are presented here.

Sample was dichotomized in two groups as pregnant (n=93) and postpartum (n=57).

Pregnant subjects were further divided in two groups as normal healthy and with respiratory disorder(s) or ailments, stated henceforth in the text as Group I-P (Gr I-P) and Group II-P (Gr II-P). The subjects with respiratory ailments had a history of respiratory disorders 6 months prior to conception or history of passive (2 hours/day) or active (> 5 cigarettes/day) smoking for at least 5 years. These subjects were recruited during their second trimester that is between 29th and 35th week of gestation. Dynamic pulmonary functions, ultrasound and arterial oxygen saturation determination was conducted within three days from recruitment.

Postpartum these same subjects of respective group termed as Group I-PP (Gr I-PP) and Group II-PP (Gr II-PP) were called 6 – 8 weeks postpartum for evaluation of change if any in their dynamic pulmonary functions and arterial oxygen saturation.

The outcomes were measured for different groups as mean ± SD. The statistical difference in the means was calculated by using paired and unpaired "t" test significant at $P < 0.05$ for appropriate corresponding groups.

Table 1 - Physical characteristics of pregnant women at mean 32 weeks.

Variables	Analysis	Group I-P (n = 93)	Group II-P (n = 57)	Unpaired "t" value	"P" value
Age (yrs)	M	23.75	23.56	0.3378	> 0.1
	SD	± 3.84	± 3.00		NS
Height	M	149.94	151.67	1.8946	> 0.05
(cm)	SD	± 5.31	± 5.50		NS
Weight	M	49.67	48.67	0.7443	> 0.1
(Kg)	SD	± 9.01	± 7.29		NS

The physical characteristics of subjects in both Gr I-P and Gr II-P as shown in table I above and graphically below are almost similar in variables as age (range: 19 – 35 years), height and weight (range: 44 – 60 kg) as is evident from their mean values. The difference in means of all three variables was found to be statistically insignificant.

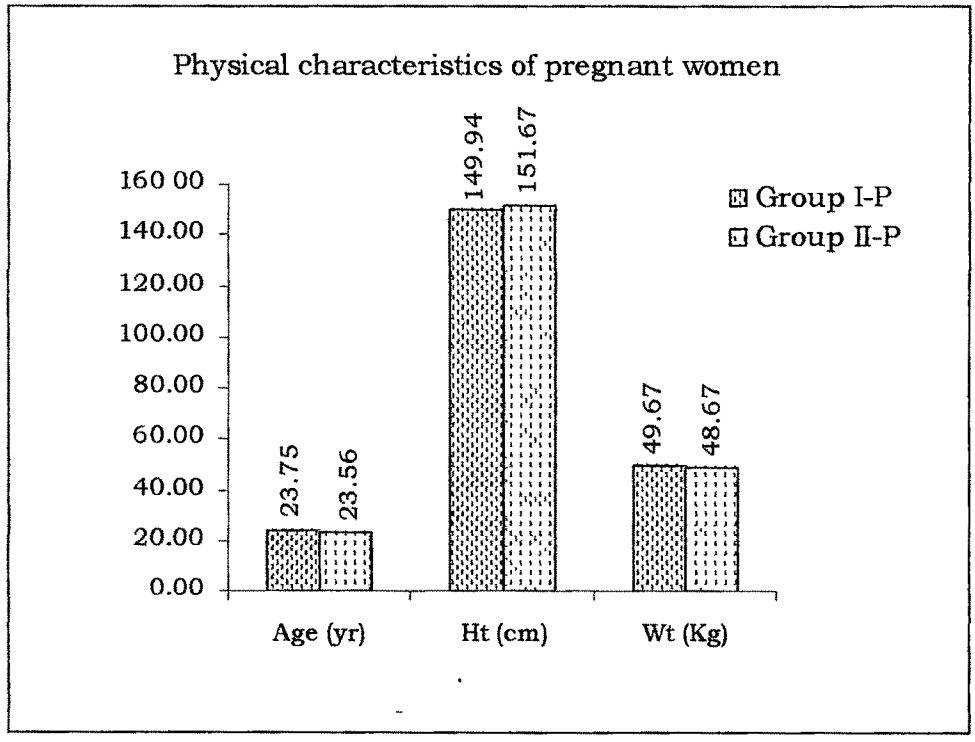


Table 2 - Physiological variations of pregnant women at mean32 weeks of gestation.

Variables	Analysis	Group I-P (n = 93)	Group II-P (n = 57)	Unpaired "t" value	"P" value
SBP	M	118.92	118.77	0.0976	> 0.1
(mm Hg)	SD	± 9.83	± 8.67		NS
DBP	M	78.02	77.54	0.6524	> 0.1
(mm Hg)	SD	± 4.43	± 4.34		NS
Pulse (rpm)	M	100.44	98.92	1.0226	> 0.1
(PR)	SD	± 9.87	± 8.24		NS
Temp	M	98.39	98.46	1.3232	> 0.1
(° F)	SD	± 0.37	± 0.29		NS
Hb	M	9.56	9.45	0.5638	> 0.1
(gm %)	SD	± 1.21	± 1.13		NS
Gestational	M	31.94	31.73	0.5136	> 0.1
period (GA)	SD	± 2.48	± 2.4		NS

Table 2 shows that SBP and DBP measured in the subjects statistically showed no difference. The PR and oral temperature too were found to be statistically insignificant. Same trend was seen in Hb content. Hence no significant difference was recorded in physiological variations in both the groups of pregnant women. The GA was in the range of 29 – 35 weeks.

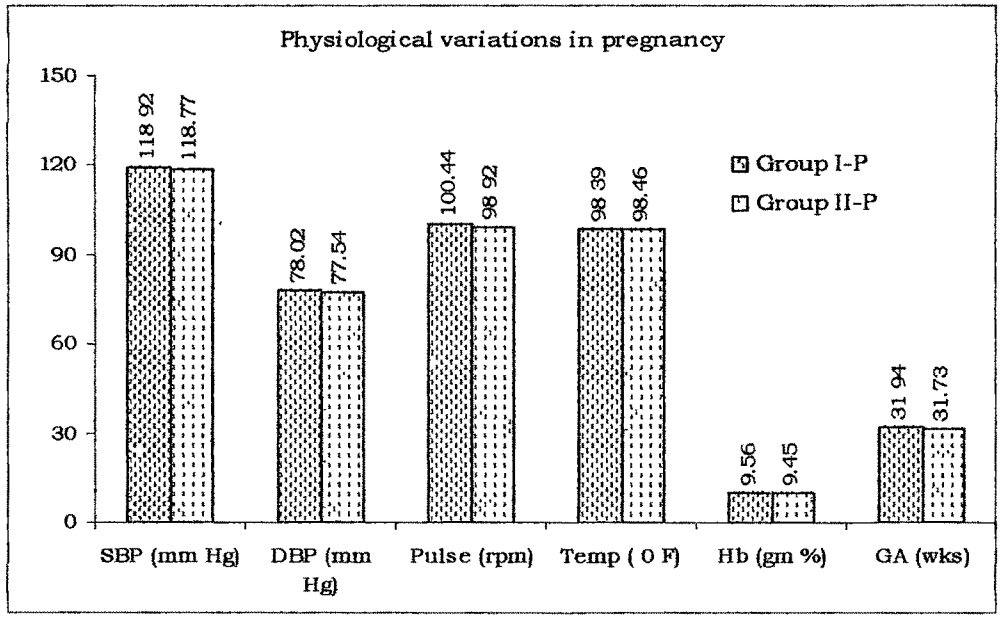
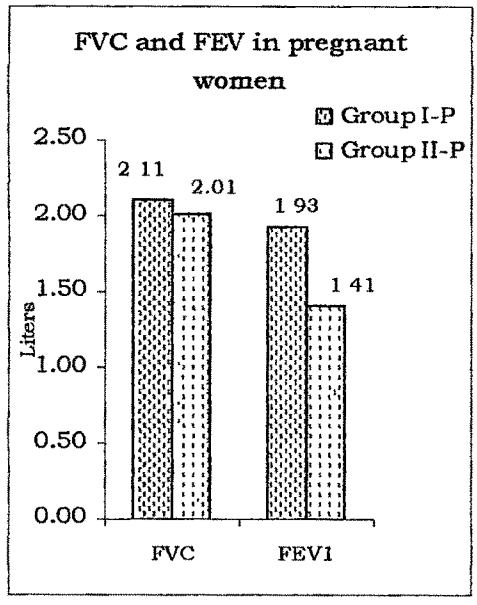


Table 3 – FVC, FEV_1 and FEV_1 % of pregnant women at mean 32 weeks.

Variables	Analysis	Group I-P (n = 93)	Group II-P (n = 57)	Unpaired "t" value	"P" value
FVC	M	2.11	2.01	1.4901	> 0.1
(lit)	SD	± 287.38	± 431.35		NS
FEV_1	M	1.93	1.41	9.1301	< 0.001
(lit)	SD	± 264.49	± 377.12		S
FEV_1 %	M	90.03	69.67	17.3927	< 0.001
	SD	± 5.26	± 7.82		S

The mean and SD of FVC, FEV_1 and FEV_1% at BTPS also termed as large airway functions are tabulated in table 3. Pregnant women of both the groups showed statistically insignificant difference in FVC while FEV_1 and FEV_1% it was found to be highly significant in group II-P at $P < 0.001$.



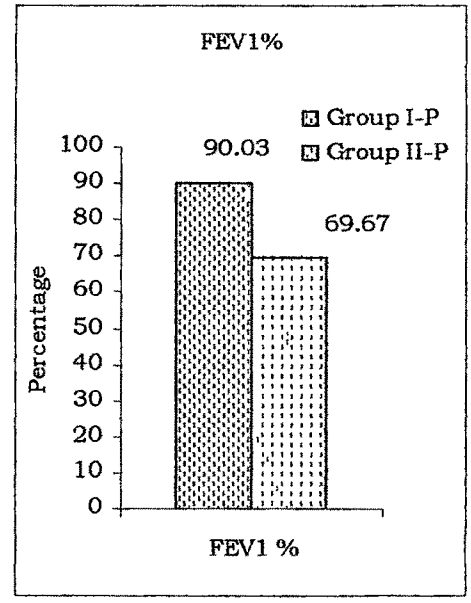


Table 4 - Expiratory flow rates (lit/sec) in pregnant women at mean 32 weeks.

Variables	Analysis	Group I-P (n = 93)	Group II-P (n = 57)	Unpaired "t" value	"P" value
FEF_{02-12}	M	2.593	1.537	8.8088	< 0.001
	SD	± 0.870	± 0.596		S
$FEF_{25-75\%}$	M	2.247	1.294	11.1195	< 0.001
	SD	± 0.615	± 0.431		S
$FEF_{75-85\%}$	M	1.107	0.725	7.3378	< 0.001
	SD	± 0.362	± 0.272		S

Mean and SD of expiratory flow rates analyzed statistically showed significantly lower values in Gr II-P as compared to Gr I-P at P < 0.001 level.

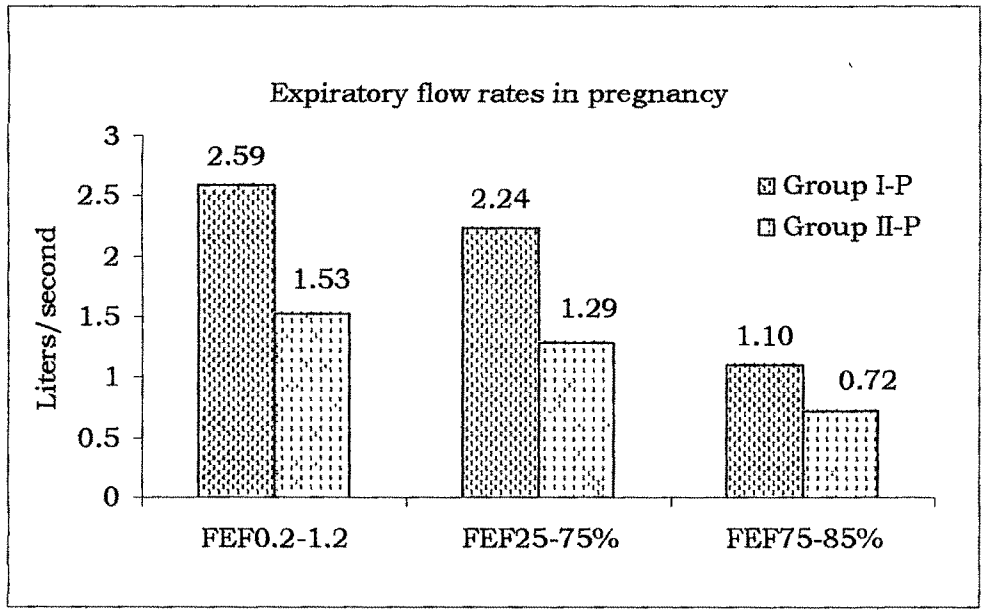


Table 5 - Instantaneous flow rates (lit/sec) of pregnant women at mean 32 weeks.

Variables	Analysis	Group I-P (n = 93)	Group II-P (n = 57)	Unpaired "t" value	"P" value
$V_{max\ 25\%}$	M	2.960	1.797	8.8517	< 0.001
	SD	± 0.923	± 0.680		S
$V_{max\ 50\%}$	M	2.425	1.432	9.3305	< 0.001
	SD	± 0.748	± 0.549		S
$V_{max\ 75\%}$	M	1.400	0.895	7.1819	< 0.001
	SD	± 0.496.	± 0.360		S

The mean and SD of instantaneous maximum flow rates are statistically and significantly lower in Gr II-P as compared to Gr I-P at P< 0.001.

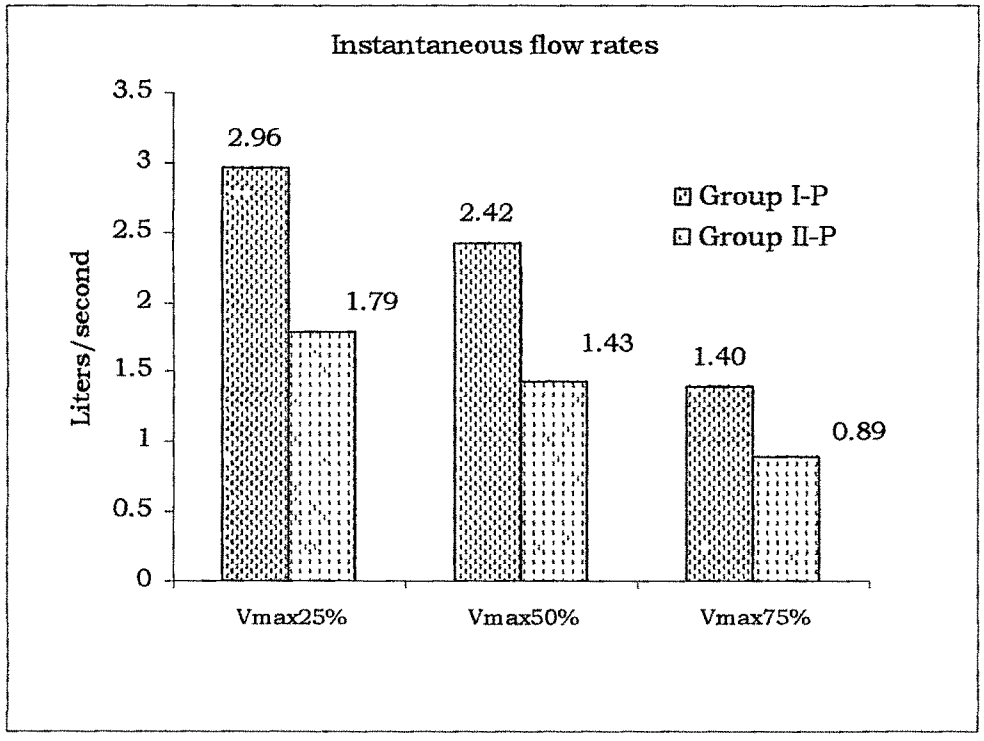


Table 6 – FVC, FEV_1 and FEV_1 % at mean 6 weeks postpartum (PP).

Variables	Analysis	Group I-PP (n = 93)	Group II-PP (n = 57)	Unpaired "t" value	"P" value
FVC (lit)	M	2.110	2.009	1.6573	> 0.05
	SD	± 0.414	± 0.349		NS
FEV_1 (lit)	M	1.833	1.4200	7.275	< 0.001
	SD	± 0.337	± 0.337		S
FEV_1 %	M	86.70	70.63	10.8164	< 0.001
	SD	± 8.36	± 9.11		S

Mean and SD of large airway functions obtained between 6 – 8 weeks postpartum shows that FVC in Gr I-P and Gr II-P are almost similar while FEV_1 and FEV_1% are statistically lower in Gr II-P when compared with Gr I-P ($P < 0.001$).

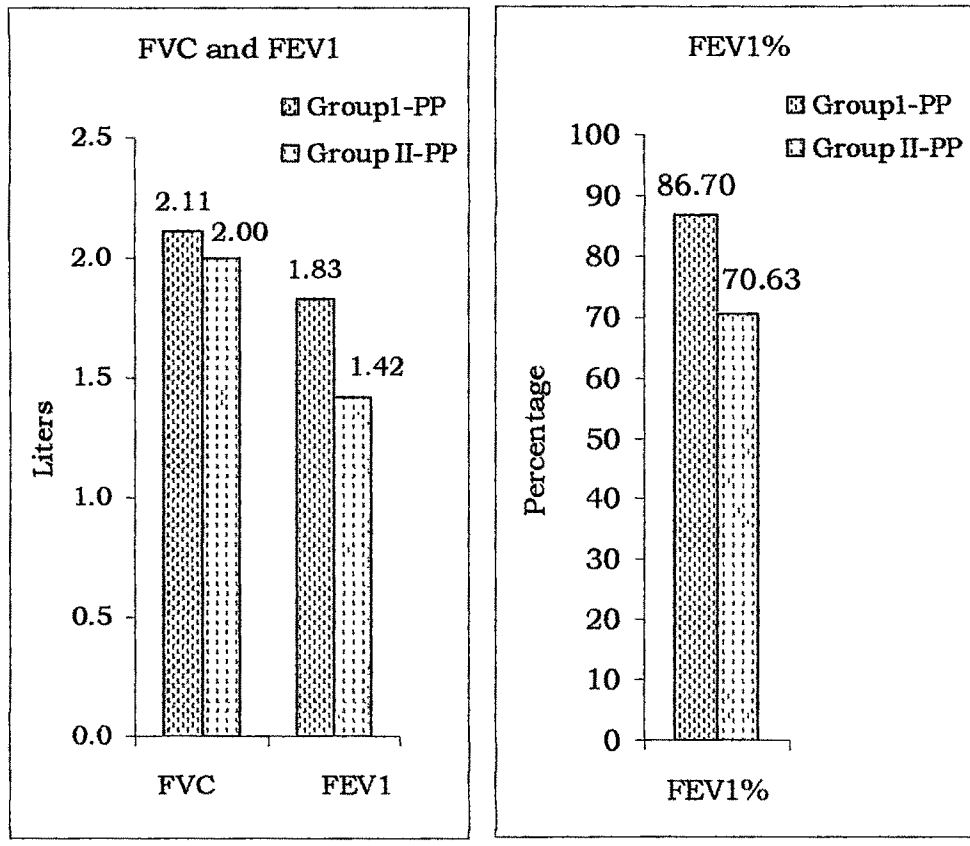


Table 7 - Expiratory flow rates at mean 6 weeks postpartum (PP).

Variables	Analysis	Group I-PP (n = 93)	Group II-PP (n = 57)	Unpaired "t" value	"P" value
FEF_{02-12}	M	2496.77	1624.21	6.3498	< 0.001
	SD	± 840.31	± 802.37		S
$FEF_{25-75\%}$	M	1972.25	1350.87	6.2211	< 0.001
	SD	± 643.38	± 561.20		S
$FEF_{75-85\%}$	M	938.49	750.17	3.6336	< 0.001
	SD	± 329.45	± 294.25		S

Expiratory flow rates at BTPS recorded between 6-8 weeks postpartum are presented in table above. The means of each parameter show significant lower values in group II-PP as compared to group I-PP ($P < 0.001$).

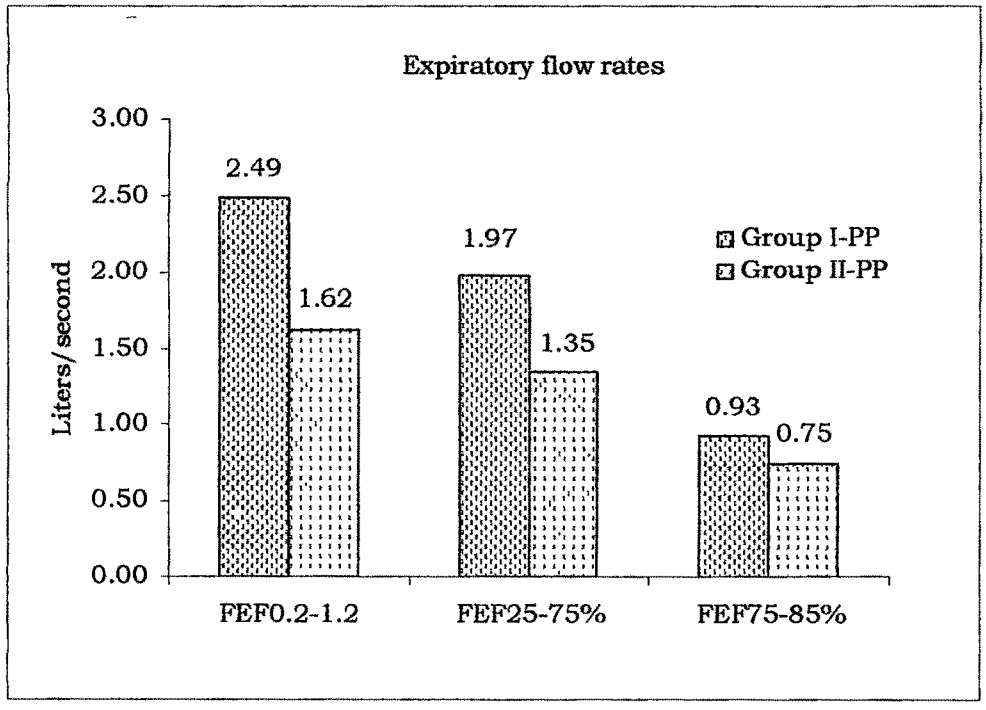


Table 8 - Instantaneous flow rates at mean 6 weeks postpartum (PP).

Variables	Analysis	Group I-PP (n = 93)	Group II-PP (n = 57)	Unpaired "t" value	"P" value
$V_{max\ 25\%}$	M	2737.74	1858.77	5.6549	< 0.001
	SD	± 968.03	± 895.95		S
$V_{max\ 50\%}$	M	2147.09	1448.94	6.6049	< 0.001
	SD	± 722.23	± 563.16		S
$V_{max\ 75\%}$	M	1157.09	896.14	3.9054	< 0.001
	SD	± 405.26	± 392.19		S

Mean and SD of instantaneous maximum flows at mentioned lung volumes recorded at BTPS in subjects between 6-8 weeks postpartum show lower significance in Gr II-PP as compared to Gr I-PP (P< 0.001).

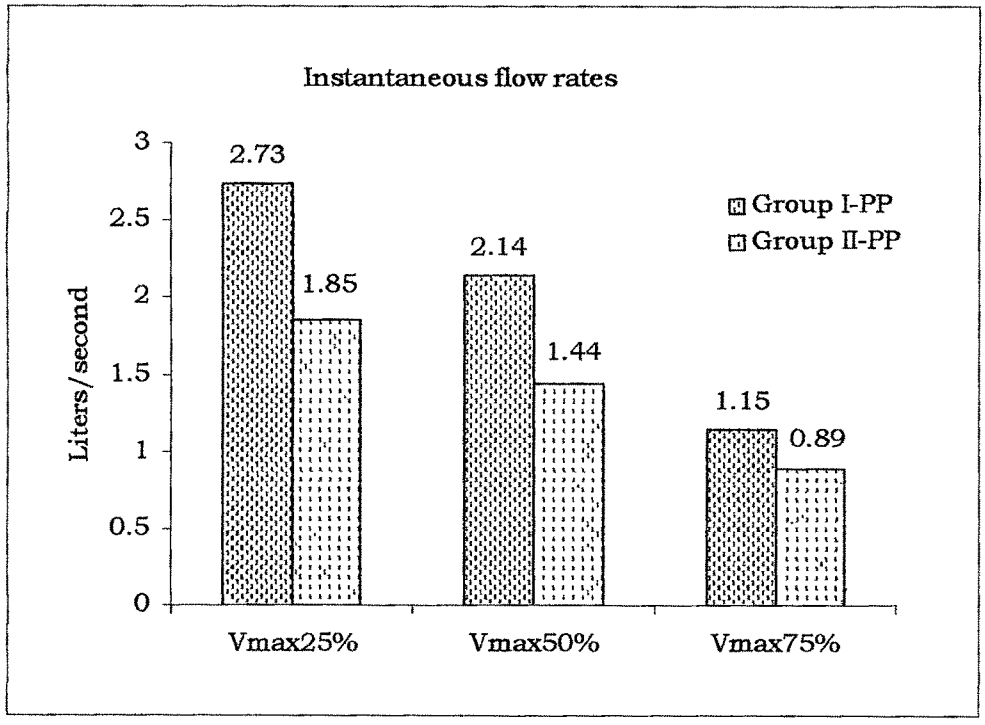


Table 9 – Arterial O2 saturation in control and experimental sample during pregnancy and postpartum.

Analysis	Pregnant Group (32 Wks)		Postpartum Group	
	Group I (n = 93)	Group II (n = 57)	Group I (n = 93)	Group II (n = 57)
Mean	98.99	97.42	97.08	95.98
SD	± 1.08	± 0.82	± 0.74	± 0.85
Unpaired "t" value	6.8677		8.0572	
"P" value	< 0.001 S		< 0.001 S	

From the above table it is evident that percentage of arterial oxygen saturation is higher in Group I that is normal subjects during pregnancy and even postpartum as compared to Group II that is subjects suffering from respiratory problems in pregnant state as well as postpartum. The high SpO_2 was found to be statistically significant.

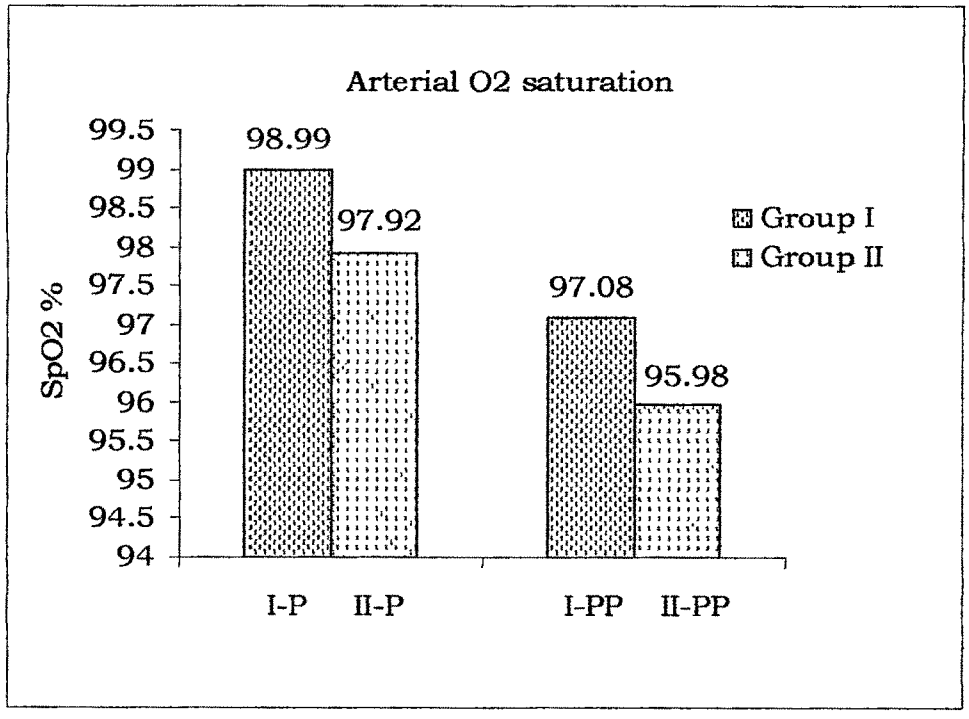


Table10 – Fetal external measurements (cm) by ultrasound at mean 32 weeks pregnancy.

Variables	Analysis	Group I-P (n = 93)	Group II-P (n = 57)	Unpaired "t" value	"P" value
BPD	M	8.06	7.91	1.3648	> 0.1
	SD	± 0.68	± 0.64		NS
HC	M	29.59	29.33	0.6161	> 0.1
	SD	± 2.26	± 2.65		NS
AC	M	26.76	25.97	1.6451	> 0.1
	SD	± 2.78	± 2.90		NS
FL	M	6.09	6.02	0.634	> 0.1
	SD	± 0.78	± 0.57		NS

The mean and SD of external measurements of fetus as determined by ultrasound in pregnant women of both group I and group II at their mean 32 weeks of gestation as presented above shows no significant change in the mentioned parameter.

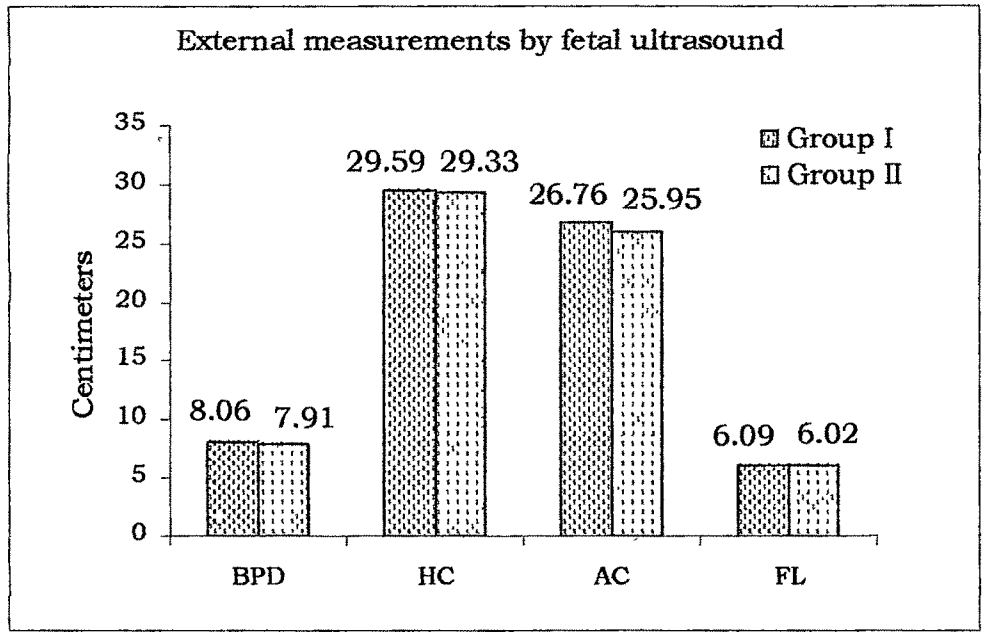
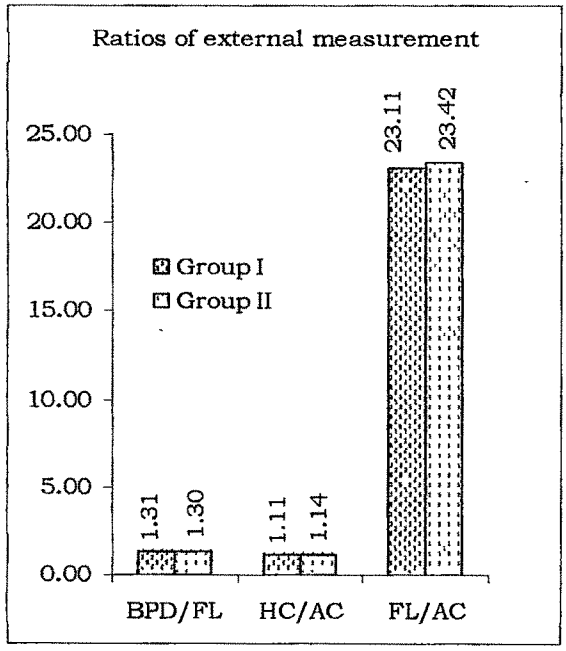


Table11 – Ratios of external measurements and estimated fetal weight (EFW) by ultrasound at mean 32 weeks pregnancy.

Variables	Analysis	Group I-P (n = 93)	Group II-P (n = 57)	Unpaired "t" value	"P" value
BPD/FL	M	1.31	1.30	0.606	> 0.1
	SD	± 0.08	± 0.10		NS
HC/AC	M	1.11	1.14	1.8181	> 0.05
	SD	± 0.08	± 0.09		NS
HC/AC	M	23.11	23.42	1.2741	> 0.1
	SD	± 1.62	± 1.33		NS
EFW	M	1808.97	1683.33	1.4743	> 0.1
	SD	± 498.74	± 511.30		NS

The mean (±SD) of ratios of external measurement viz the BPD/FL, HC/AC and FL/AC and EFW as calculated mathematically using standard formulae are presented. No significant change in the recorded means was found between group I and group II in all the parameter.



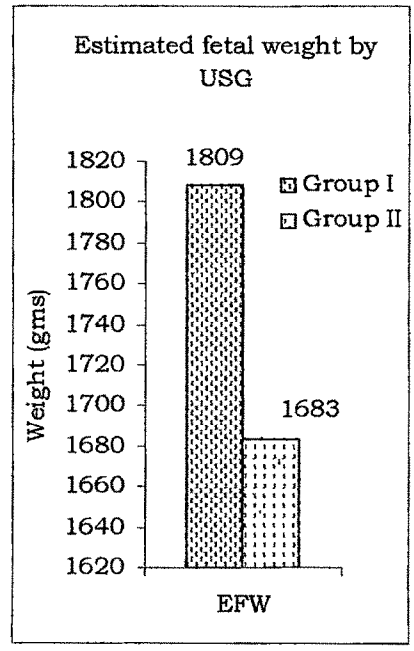


Table 12 - Neonatal outcome parameters of group I and group II.

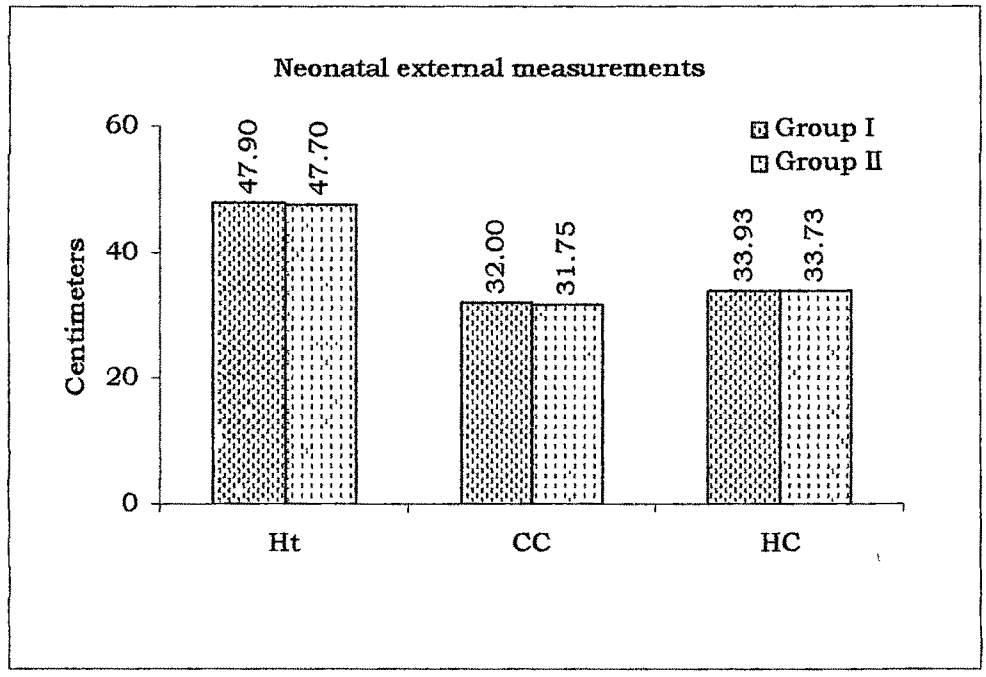
Variables	Analysis	Group I (n = 93)	Group II (n = 57)	Unpaired "t" value	"P" value
GA (wks) at	M	38.41	38.42	0.0619	> 0.1
delivery	SD	± 1.21	± 0.77		NS
Birth	M	2643.97	2319.29	6.1988	< 0.001
weight (gm)	SD	± 368.81	± 270.20		S
Height	M	47.90	47.70	0.7243	> 0.1
(cm)	SD	± 1.81	± 1.53		NS
PI	M	2.40	2.13	7.5208	< 0.001
	SD	± 0.29	± 0.15		S
CC (cm)	M	32.00	31.75	1.0068	<0.1
	SD	± 1.52	± 1.45		NS
HC (cm)	M	33.93	33.73	0.7939	> 0.1
	SD	±1.66	± 1.39		NS

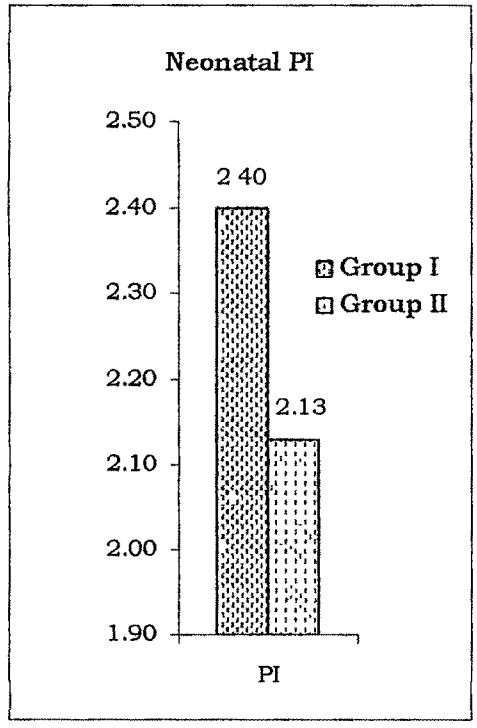
The mean gestational age of 38 weeks was recorded at delivery of both the groups.

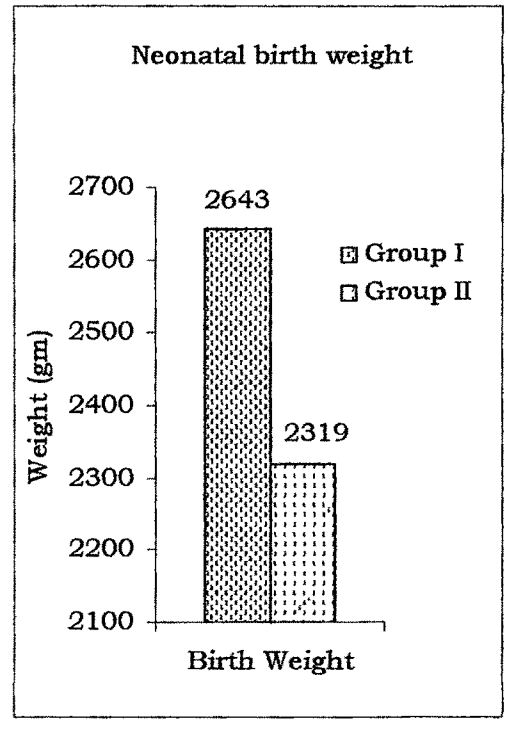
The neonatal data collected retrospectively from the hospital records were birth weight, Ht, CC and HC while the PI was mathematically calculated using the formula.

It was noted that the birth weight was significantly lower in Group II as compared to Group I and hence the PI. PI <2.2 is suggestive of asymmetrical IUGR. The mean PI noted in Group II is <2.2, suggesting a fetal growth retardation within this group.

Infants with birth weight <2500 gm are categorized as low birth weight babies, as evident from the mean birth weight of infants in Group II is found to be <2500 gm and thus LBW babies


Neonatal external measurements
60
40
20
0
Centimeters
47.90
47.70
32.00
31.75
33.93
33.73
Group I
Group II
Ht
CC
HC


Neonatal PI
2.50
2.40
2.30
2.20
2.10
2.00
1.90
2 40
2.13
Group I
Group II
PI


Neonatal birth weight
2700
2600
2500
2400
2300
2200
2100
Weight (gm)
2643
2319
Group I
Group II
Birth Weight

Discussion