RESULTS

Table (3) : Clinical data and hemodynamic findings in complicated preterm and non complicated group.

	Complicated preterm group	*Non complicated group*
Number of patients	44	52
Age (days)	12.68 ± 6.47	8.94 ± 7.25**
Gestational age (week)	33.90	34.11
Male / female	25/19	29/23
Weight (kg)	1.74 ± 0.54	2.13 ± 0.63
Heart rate (beats /min)	142.75 ± 21.24	135.26 ± 18.18
Mean B.P. (mmHg)	59.79 ± 9.25	60.25 ± 12.67
Systolic B.P (mmHg)	72.56 ± 9.81	70.98 ± 13.59
Diastolic B.P. (mmHg)	48.06 ± 8.78	47.59 ± 11.86

B.P. = Blood pressure.

** $P \leq 0.01$

Table (4) : Echocardiographic findings in preterm and fullterm infants.

	Preterm (96)	*Fullterm (50)*	*P value*
Left ventricular end-systolic diameter (cm) (LVESD)	0.96 ± 0.25	1.16 ± 0.21	≤0.01
Left ventricular end-diastolic diameter (LVEDD)	1.40 ± 0.28	1.65 ± 0.22	≤0.01
End-systolic post. wall thickness (cm) (ESPW)	0.31 ± 0.09	0.41 ± 0.31	≤0.01
End-diastolic post. wall thickness (cm) (EDPW)	0.23 ± 0.08	0.28 ± 0.09	≤0.01
End-systolic septal thickness (cm) (ESS)	0.38 ± 0.12	0.50 ± 0.13	≤0.01
End-diastolic septal thickness (cm) (EDS)	0.32 ± 0.10	0.41 ± 0.14	≤0.01
Fractional shortening (FS) %	32.38 ± 9.61	30.12 ± 6.6	N.S.
Ejection fraction (EF)	0.63 ± 0.11	0.60 ± 0.09	N.S.
Left ventricular mass (gm)	5.17 ± 1.99	7.95 ± 2.34	≤0.01

$P \leq 0.01$ N.S. Not significant

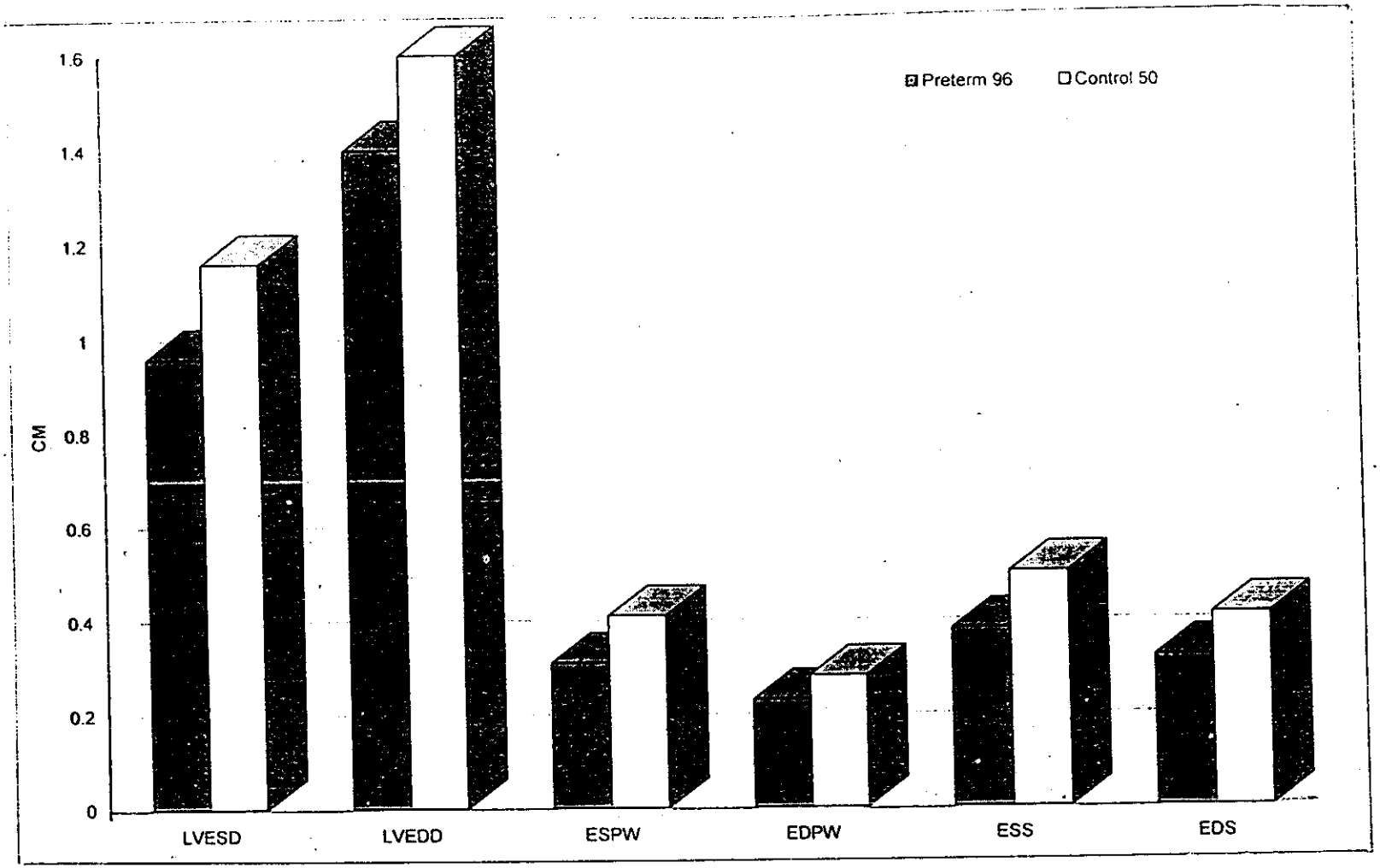


Fig. (3): Different Echocardiographic Parameters in preterm and fullterm infants

Table (5) : Echocardiographic findings in complicated preterm and non complicated group.

	Complicated preterm (44)	*Non complicated preterm (52)*	*P value*
Left ventricular end-systolicdiameter (cm) (LVESD)	0.92 ± 0.28	1,0 ± 0.22	N.S.
Left ventricular end-diastolic diameter (LVEDD)	1.33 ± 0.32	1.46 ± 0.23	≤0.05*
End-systolic post. wall thickness (cm) (ESPW)	0.32 ± 0.09	0.31 ± 0.10	N.S.
End-diastolic post. wall thickness (cm) (EDPW)	0.22 ± 0.08	0.23 ± 0.08	N.S.
End-systolic septal thickness (cm) (ESS)	0.36 ± 0.12	0.39 ± 0.12	N.S.
End-diastolic septal thickness (cm) (EDS)	0.31 ± 0.08	0.33 ± 0.11	N.S.
Fractional shortening (FS) %	33.92 ± 8.76	31.09 ± 10.19	N.S.
Ejection fraction (EF)	0.65 ± 0.11	0.61 ± 0.11	N.S.
Left ventricular mass (gm)	4.73 ± 1.66	5.55 ± 2.17	≤0.05

P ≤ 0.05 N.S. Not significant

Table (6): Echocardiographic findings in different groups.

	Complicated preterm (44)	*Non complicated preterm (52)*	*Fullterm (50)*
Left ventricular end-systolicdiameter (cm) (LVESD)	0.92 ± 0.28**	1.0 ± 0.22**	1.16 ± 0.21
Left ventricular end-diastolic diameter (LVEDD)	1.33 ± 0.32**	1.46 ± 0.23**	1.65 ± 0.22
End-systolic post. wall thickness (cm) (ESPW)	0.32 ± 0.09	0.31 ± 0.10*	0.41 ± 0.31
End-diastolic post. wall thickness (cm) (EDPW)	0.22 ± 0.08**	0.23 ± 0.08**	0.28 ± 0.09
End-systolic septal thickness (cm) (ESS)	0.36 ± 0.12**	0.39 ± 0.12**	0.50 ± 0.13
End-diastolic septal thickness (cm) (EDS)	0.31 ± 0.08**	0.33 ± 0.11**	0.41 ± 0.14
Fractional shortening (FS) %	33.92 ± 8.76*	31.09 ± 10.19	30.12 ± 6.6
Ejection fraction (EF)	0.65 ± 0.11*	0.61 ± 0.11	0.60 ± 0.09
Left ventricular mass (gm)	4.73 ± 1.66**	5.55 ± 2.17**	7.95 ± 2.34

** $P \leq 0.01$ * $P \leq 0.05$

Each group compared with full term.

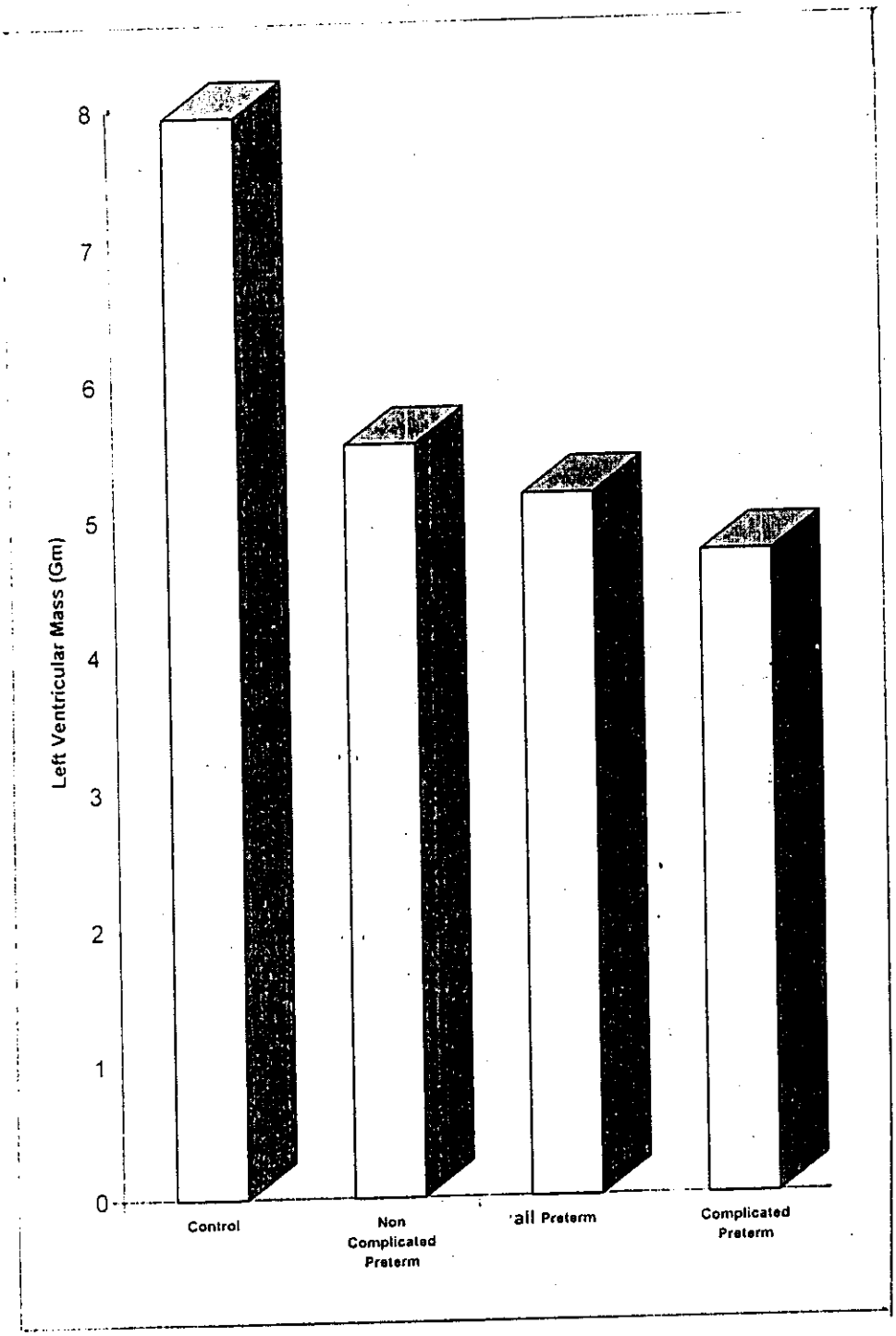


Fig. (4): Left Ventricular Mass in preterm, fullterm, Complicated preterm, and Non complicated groups .

Table (7): VCF and wall stress in preterm and fullterm infants

	Preterm	*Fullterm*	*P value*
VCF (circ/ sec).	1.15 ± 0.42	1.11 ± 0.28	N.S.
Endsystolic wall stress (ESWS) (gm/cm^2)	52.08 ± 31.02	58.60 ± 39.86	N.S.

VCF = Velocity of circumferential fiber shortening.

N.S. = Not significant.

Table (8): VCF and wall stress in complicated preterm and non complicated group.

	Complicated pretem	*Non complic-ated group*	*P value*
VCF (circ/ sec).	1.23 ± 0.43	1.09 ± 0.40	N.S.
Endsystolic wall stress (ESWS) (gm/cm^2)	50.97 ± 31.94	55 ± 28.20	N.S.

VCF = Velocity of circumferential fiber shortening.

N.S. = Not significant.

Table (9) : VCF and wall stress in different groups.

	Fullterm (96)	*Complicated pretem*	*Non complicated group*
VCF (circ/ sec).	1.11 ± 0.28	1.23 ± 0.43 (N.S.)	1.09 ± 0.40 (N.S.)
Endsystolic wall stress (ESWS) (gm/cm^2)	58.60 ± 39.86	50.97 ± 31.94 (N.S.)	55 ± 28.20 (N.S.)

VCF = Velocity of circumferential fiber shortening.

N.S. = Not significant compared with fullterm.

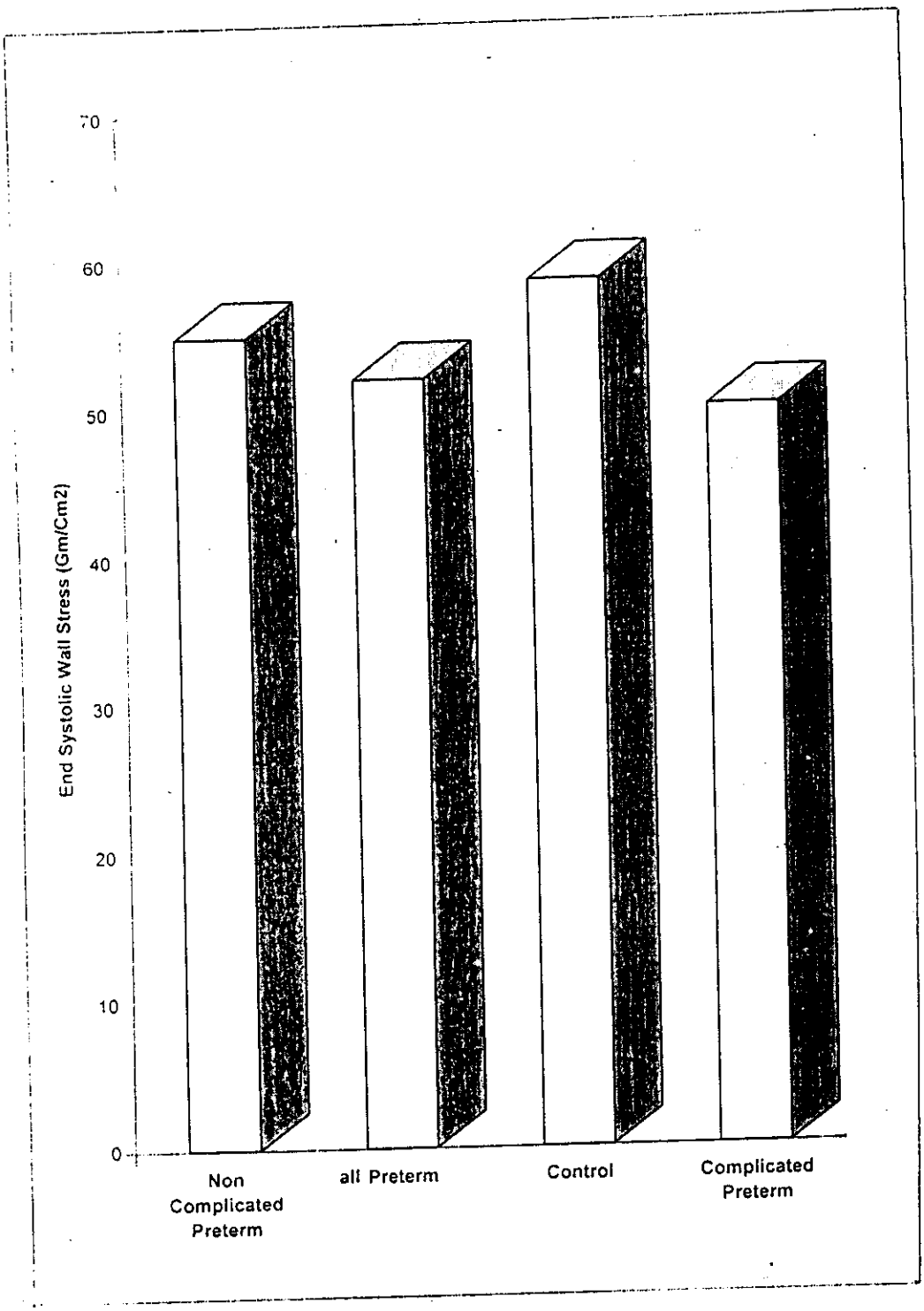


Fig. (5): End Systolic Wall Stress in All Different groups (preterm, fullterm, Complicated preterm, and Non complicated) .

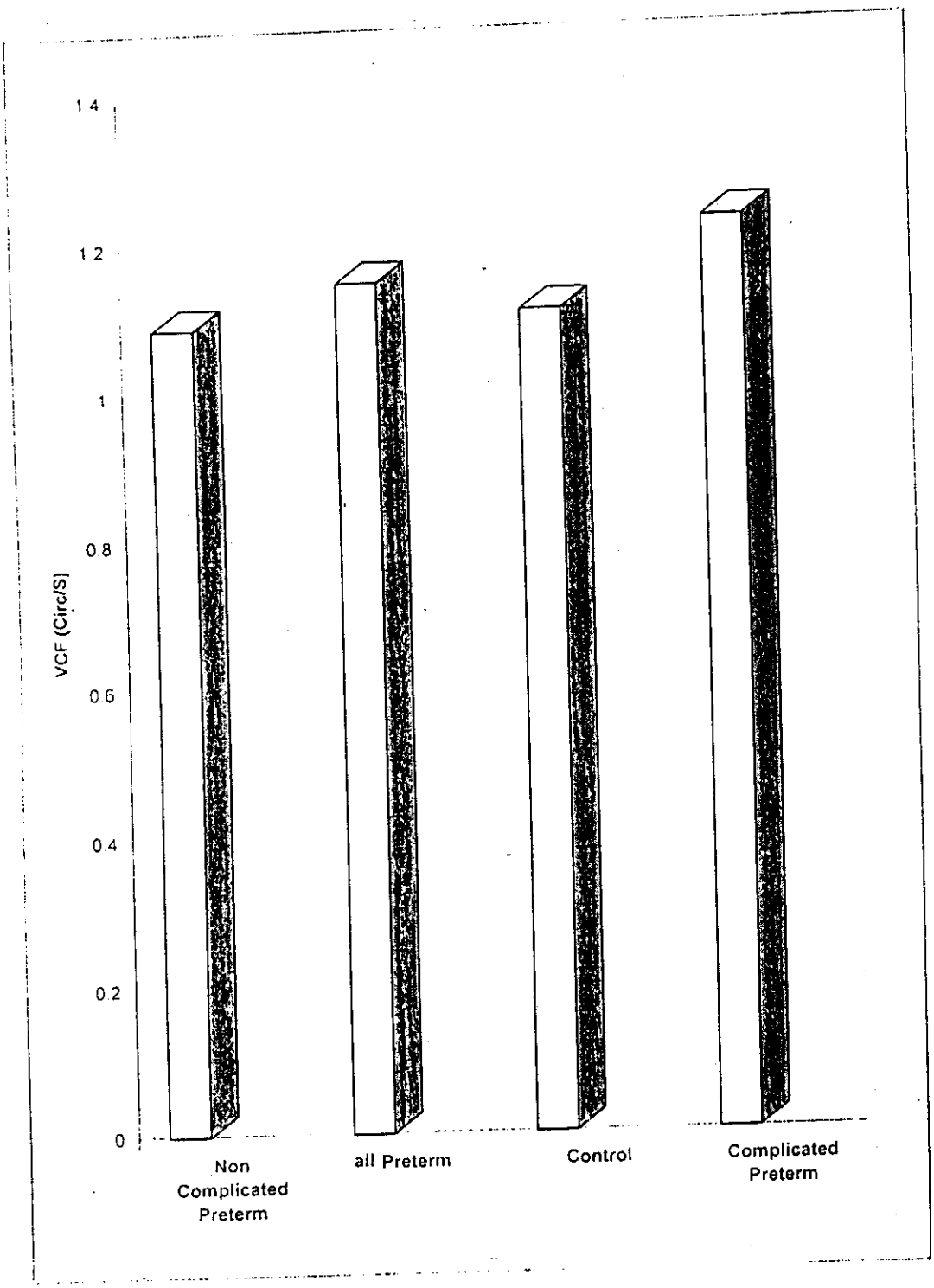


Fig. (6): VCF (Velocity of Circumferential Fiber Shortening in preterm, fullterm, Complicated preterm, and Non complicated groups

Table (10): Pulmonary artery pressure and ejection fraction of right ventricle in preterm and fullterm infants.

	Preterm (96)	*Fullterm (50)*	*P value*
Pulmonary artery pressure (mmHg)	51.92 ± 13.7	47.36 ± 11.33	≤ 0.05
Ejection fraction of right ventricle	0.40 ± 0.32	0.44 ± 0.16	N.S.

P ≤ 0.05 (significant) N.S. Not significant

Table (11) : Comparison between pulmonary artery pressure and ejection fraction of right ventricle in different groups.

	Complicated preterm	*Non complicated group*	*Fulltem group*
Pulmonary artery pressure (mmHg)	52.66 ± 11.36*	51.30 ± 15.63	47.36± 11.33
Ejection fraction of right ventricle	0.37 ± 0.13*	0.44 ± 0.42	0.44 ± 0.16

* Significant P ≤ 0.05. N.S. Not significant.

(Each group compared with fullterm)

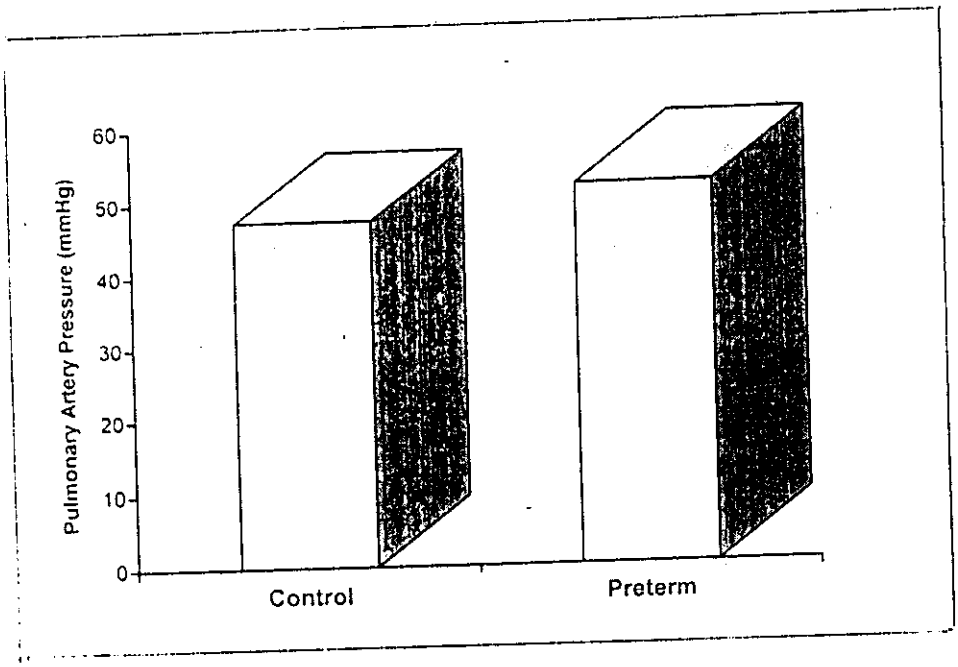


Fig. (7): Pulmonary Artery Pressure Estimated by Echo-Doppler in Preterm and Fullterm Infants

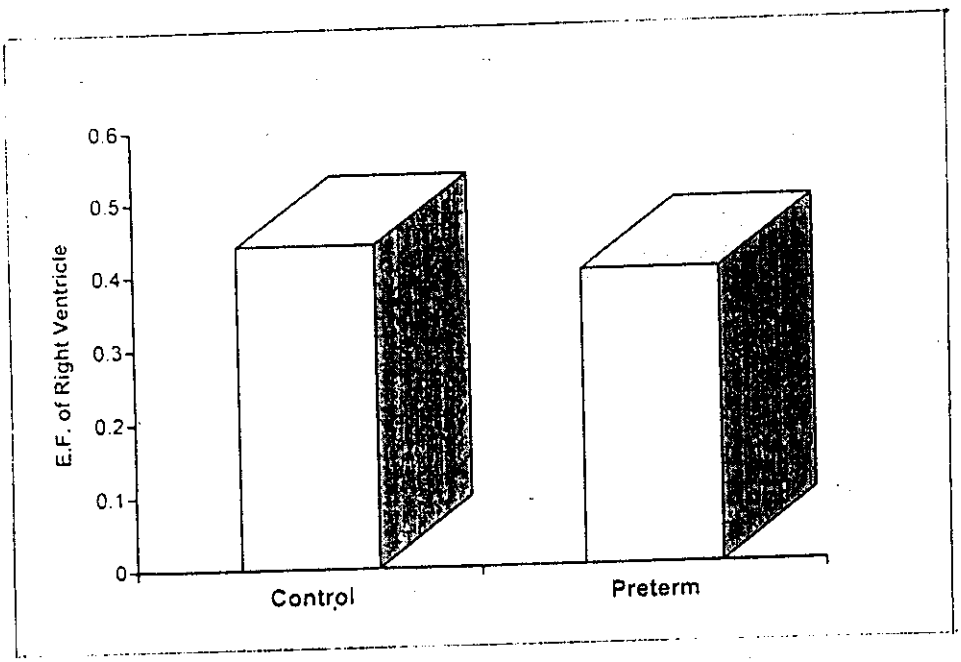
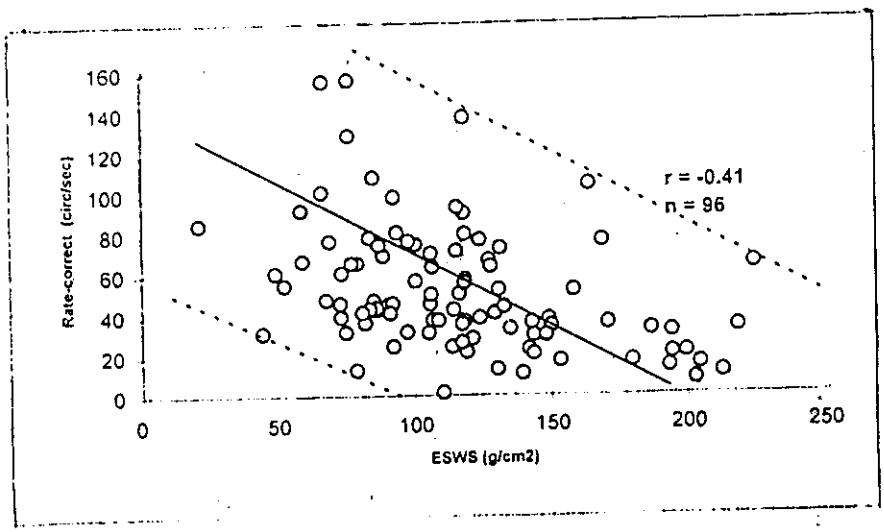


Fig. (8): Ejection Fraction of Right Ventricle in Preterm and Fullterm Infants



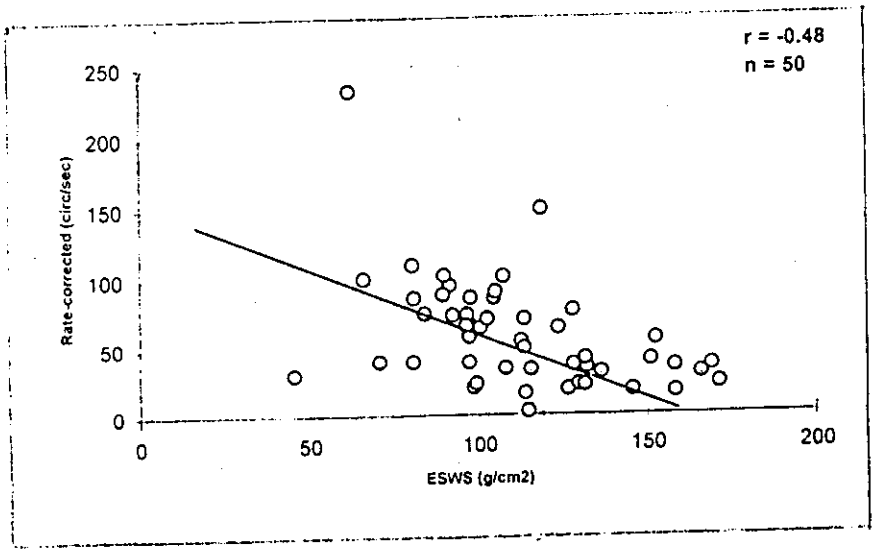
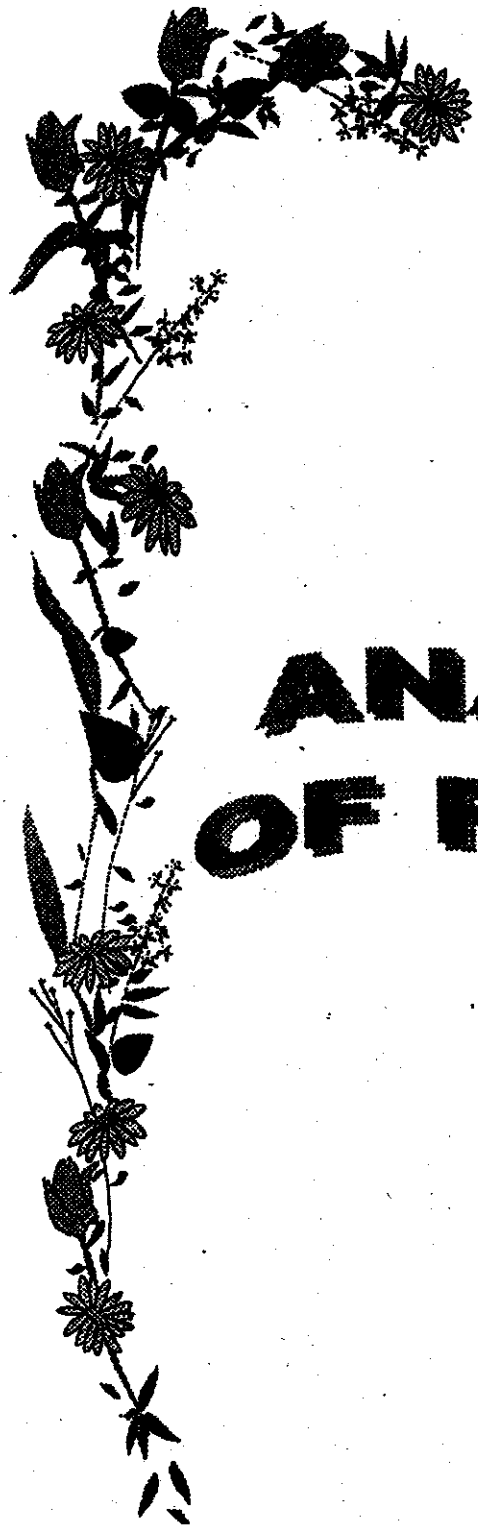


Fig. (9): **Rate-Corrected Velocity of Circumferential Fiber shortening (VCFc) - end - systolic wall stress (ESWS) relation in preterm infants (top) and full-term (bottom)**



ANALYSIS OF RESULTS

ANALYSIS OF RESULTS

All the results of this work are summarised in table 2 to 11 and figure 3 to 11.

Patients characteristic and hemodynaemic parameters of preterm and fullterm infant are shown in table (2). Preterm infants were 96 (54 males 56.2% and 42 females 43.8%). Their age between 1-30 days with a mean of 10.65 ± 7.12, their weight ranged between 0.6-3.5 kg with a mean of 1.95 ± 0.62 kg and their gestational age range from 26-36w with a mean of 33.90 week. Their heart rate ranged between 92-191 with a mean of 138.69 ± 19.8 beats / min their systolic blood pressure (B.P.) ranged between 44-99 with a mean of 71.70 ± 11.97 mmHg, diastolic B.P. ranged between 27-70 with a mean of 47.8 ± 10.5 mmHg and mean B.P. ranged between 37-86 with a mean of 60.04 ± 11.1 mmHg.

Fullterm infants were 50 [29 male (58%) and 21 (42%) Females].Their age ranged from 1-7 days with a mean of 3.18±1.52 and their weight ranged between 2.6-4.5kg with a mean of 3.51 ± 0.51.

Their heart rate ranged between 97-235 beats /min with a mean of 132.16 ± 29.54.

Their systolic blood pressure ranged between 44-88 mmHg with a mean of 67.92 ± 9.91, diastolic blood pressure ranged between 27-77mmHg with a mean of 43.94 ± 9.57, and mean B.P. ranged from 41-90 mmHg with a mean of 55.28 ± 9.77. The age and weight between the two group were highly significant ≤ 0.01 also the diastolic B.P. and the mean blood pressure respectively were significant in comparion between the preterm and full term infants ≤ 0.05.

Also clinical data and haemodynamic findings in complicated preterm and non complicated group are shown in table (3) Complicated preterm infants were 44 (25 males (56.8%), 19 females (43.2%)). Their age are ranged between 4-30 with a mean of 12.68 ± 6 dayes, and their gestational age ranged between 26-36 week with a mean of 35.45. Their weight ranged between 0.8-3.1 kg with a mean of 1.74 ± 0.54 kg.

Their heart rate ranged between 92-181 with a mean of 142.75 ± 21.24 beats/min. Their systolic blood pressure (S.B.P.) ranged between 52-94 with a mean 72.36 ± 9.8 mmHg diastolic B.P ranged between 30-70 with a mean of 48.06 ± 8.7 mmHg and mean B.P. ranged between 37-77 with a mean of 59.7 ± 9.2 mmHg.

Non complicated preterm infants, were 52 (29 males (55.8%) and 23 Females (44.2%). Their age ranged between 1-30 days with a mean of 8.9 ± 7.2 days and their gestational age ranged between 28-36 week with a mean of 35.26. Their weight ranged between 0.6-3.5 kg with a mean of 2.13 ± 0.6 kg. Their heart rate ranged between 102-191 with a mean of 135.2 ± 18.1 beats/min. Their S.B.P. ranged between 44-99 with a mean 70.9 ± 13.5 mmHg, diastolic B.P. ranged between 27-66 with a mean of 47.5 ± 11.8mmHg and mean B.P. ranged between 39-86 with a mean of 60.2 ± 12.6 mmHg.

Table (4) Fig (3-4) showes echocardiographic findings in preterm and full term, which include the left ventricular end systolic diameter (LVESD), left ventricular end-diastolic diameter (LVEDD), and systolic posterior wall thickness (ESPW), end-diastolic posterior wall thickness (EDPW), end systolic septal thickness (ESS), end diastolic septal thickness (EDS) and left ventricular mass.

All the previous parameters were statistically significant between both groups ($P \leq 0.01$), but there was no significant difference between preterm and full term in fractional shortening and ejection fraction (32.38 ± 9.6 vs 30.1 ± 6.6 and 0.63 ± 0.1) vs 0.60 ± 0.09 respectively.

Echocardiographic findings in complicated preterm and non complicated group are shown in table (5)

There were significant differences in left ventricular end-diastolic diameter and left ventricular mass (1.33 ± 0.3 vs 1.46 ± 0.2 cm and 4.7 ± 1.6 vs 5.5 ± 2.1gm) $P \leq 0.05$, while the other echocardiographic parameters showed no significant differences between both groups.

Table (6) showes Echocardiographic parameters which include LVESD, LVEDD. EDPW, ESPW, ESST, EDST, LV mass. There were highly significant differences between complicated preterm and non complicated preterm when compared each of them with control group $P \leq 0.01$, also there were statistically significanct differences between complicated preterm and fullterm as regard F.S and E.F. ($P \leq 0.05$), while there were no significant difference between non complicated preterm and fullterm as regard E.F. and F.S.

In table (7) (Fig. 5.6) there is comparison between full-term and preterm as regard to velocity of circumferential fiber shortening (VCF) and end systolic wall stress (ESWS), although the preterm infants values for VCF were high (1.15 ± 0.4 vs 1.11 ± 0.2) and those for ESWS were low but this was not statistically significant (52.08 ± 31.02 VS 58.60 ± 39.86).

In table (8) Fig. (5-6) no significant differences in VCF and wall stress between complicated and non complicated preterm infants.

Table (9) there were no signficant differences between the complicated and non complicated preterm groups as regard to VCF and ESWS .

Pulmonary artery pressure and ejection fraction of the right ventricle in preterm and full term are shown in table(10)Fig. (7-8) the mean pulmonary artery pressure was significantly higher in preterm (51.9 ± 13.7 vs 47.36 ± 11.3) ($P \leq 0.05$), but no significant difference in the ejection fraction of the right ventricle between both groups.

Comparsion between mean pulmonary artery pressure (mmHg) and ejection fraction of right ventricle in different groups is presented in table (11). There were significant differences in both mean pulmonary artery pressure and ejection fraction of the right ventricle between complicated preterm and full term group (52.66 ± 11.3 mmHg and 0.37 ± 0.13 versus 47.36 ± 11.3 mmHg and 0.44 ± 0.1) respectively.

Figure (9-10) show a linear regression relating the VCF and wall stress in preterm, fullterm, complicated and non complicated preterm respectively, there was inverse linear correlation between VCF and wall stress in all studied groups.