RESULTS

The results of this study will be shown in tables (9-18 and in figures 4-14).

Table (9): Some of the clinical findings of the studied groups.

Parameter	Group I	Group II	Group III
Age (years)	9 – 12 14.35±2.75	5 – 15 11.15±2.53	4 – 18 13.05±2.52
Sex : - males -females	13 (65 %) 7 (35 %)	14 (70 %) 6 (30 %)	11 (55 %) 4 (45 %)
Duration of illness (year)	2 – 10 5.65±2.03	1 – 7 3.35±1.95	
Duration of treatment (year)	1 – 10 3.65±2.05	1 – 7 3.00±1.80	
Systolic BP (mmHg)	110 – 180 141±17.7	90 – 180 132±22.8	90 – 120 107±11.8
Diastolic BP (mmHg)	70 -100 86±8.21	50 – 100 79.5±10.50	60 – 80 72.5±6.90

Table (10): Findings of cardiovascular examination in the studied groups of patients.

Clinical Findings	Group I (n=20)	Group II (n=20)
Hypotension	-	1 (5%)
Normal BP	7 (35%)	7 (35%)
Hypertension	13 (65%)	12 (60%)
Pericardial bulge	-	1 (5%)
Gallop	5 (25%)	4 (20%)
Muffled heart sounds	9 (45%)	8 (40%)
Audible murmur	4 (20%)	2 (10%)
Lower limb edema	1 (5%)	2 (10%)
Congested neck veins	3 (15%)	2 (10%)
Tender liver	3 (15%)	2 (10%)

Table (11): X- ray and ECG findings in the studied groups of patients.

Findings	Group I (n=20)	Group II (n=20)
X-ray		
Cardiomegaly	3 (15%)	1 (5%)
Abnormal cardiac shadow	-	-
Pericardial effusion	1 (5%)	2 (10%)
Pulmonary congestion	3 (15%)	3 (15%)
ECG		
RA enlargement	-	-
RV enlargement	-	-
LA enlargement	-	1 (5%)
LV enlargement	4 (20%)	4 (20%)
Abnormal P- wave	-	-
Prolonged PR	4 (20%)	2 (10%)
Abnormal QRS	-	-
Inverted T-wave	3 (15%)	4 (20%)

Table (12): Echocardiographic findings in the studied groups of patients

Findings	Group I (n=20)	Group II (n=20)
RA enlargement	3 (15%)	3 (15%)
RV enlargement	-	1 (5%)
Septal hypertrophy	12 (60%)	9 (45%)
LVPW hypertrophy	16 (80%)	18 (90%)
LV enlargement	2 (10%)	1 (5%)
Increased LVMI	12 (60%)	2 (10%)
Decreased EF	8 (40%)	6 (30%)
Decreased FS	8 (40%)	6 (30%)
TR	-	7 (35%)
MR	4 (20%)	2 (10%)
AR	1 (5%)	3 (15%)

LA, RV, IVS, LVPW and LV are considered enlarged if their diameters are 2SD above the mean for age and sex. EF and FS are considered abnormal if they are below the normal value for age and sex.

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Table (13): Mean ± SD of the echocardiographic findings in the studied groups.

Findings	Group I	Group II	Group III
LAD (mm)	88 – 146 114±15.9	85 – 159 120±17	82 - 125 98±14
RVD (mm)	59 – 150 89.2±20.4	56 – 145 105±28.5	76 – 129 109±16.7
IVSD (mm)	38.202 117±45.4	58 – 395 156±65	83 – 139 113±17.2
LVPWD (mm)	87.5 – 246 173±37.3	123 – 255 185±32	75 – 135 111±16.1
LVDD (mm)	70 – 115 92.7±11.5	68 – 128 95±16.8	71.5 – 104 92.5±6.7
LVMI (G/m^2)	45 – 186 94.15±28.6	29 – 138 72±37.6	43 – 88 60.9±13.9
IRT (m.sec.)	35 – 84 55.4±12.3	23 – 77 50±11.4	31.46 40±6.1
ICT (m.sec.)	35 – 84 53.5±13	38 – 338 58±66	41 – 54 50±4.5
EF (%)	45 – 89 72.7±11	6 – 86 64±17.7	45 – 73 60±8.1
FS (%)	23 - 59 43.2±9.9	29.71 70.7±10	22 – 45 29±6

Table (14): Mean ± SD of serum CTnI in the studied groups.

	Group I	Group II	Group III
Serum CTnI (ng/ml)	0.03 – 0.61 0.14 ± 0.138	0.05 – 0.22 0.09 ± 0.04	0.01 – 0.03 0.05 ± 0.002

Table (15) shows a significant increase of RVD and IVSD in patient of group II in comparison to those in group I **(P< 0.05)** (figure 5). Meanwhile, there was a significant increase LVMI in group I in comparison to those in group II **(P<0.05)** (figure 6). No significant differences between these two groups regarding the other echocardiographic parameters **(P>0.05)**. There was highly significant increase in LAD (figure 5), LVPWD, LVMI, IRT, EF and FS in group I in comparison to group III (figure 6&7). Meanwhile, there was a significant decrease in RVD in group I in comparison to those in group III **(P<0.001)** (figure 5).

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Table (15): Comparison of the ECHO findings of group I to groups II and III.

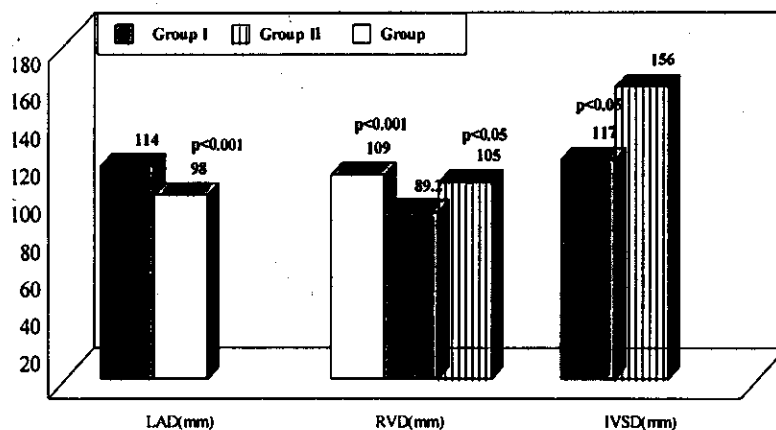| Findings	Group I	Group II	Group III
LAD (mm)	88 – 146	85 – 159	82 - 125
	114±15.9	120±17	98±14
		t=1.15	t=3.37
		p>0.05	p<0.001**
RVD (mm)	59 – 150	56 – 145	76 – 129
	89.2±20.4	105±28.5	109±16.7
		t=2.10	t=3.41
		p<0.05*	p<0.001**
IVSD (mm)	38.202	58 – 395	83 – 139
	117±45.4	156±65	113±17.2
		t=2.21	t=0.34
		p<0.05*	p>0.05
LVPWD (mm)	87.5 – 246	123 – 255	75 – 135
	173±37.3	185±32	111±16.1
		t=1.09	t=6.81
		p>0.05	p<0.0001**
LVDD (mm)	70 – 115	68 – 128	71.5 – 104
	92.7±11.5	95±16.8	92.5±6.7
		t=0.26	t=0.11
		p>0.05	p>0.05
LVMI (G/m²)	45 – 186	29 – 138	43 – 88
	94.15±28.6	72±37.6	60.9±13.9
		t=2.09	t=4.65
		p<0.05*	p<0.0001**
IRT (m.sec.)	35 – 84	23 – 77	31.46
	55.4±12.3	50±11.4	40±6.1
		t=1.41	t=4.91
		p>0.05	p<0.0001**
ICT (m.sec.)	35 – 84	38 – 338	41 – 54
	53.5±13	58±66	50±4.5
		t=0.30	t=1.18
		p>0.05	p>0.05
EF (%)	45 – 89	6 – 86	45 – 73
	72.7±11	64±17.7	60±8.1
		t=1.81	t=4.01
		p>0.05	p<0.0001**
FS (%)	23 - 59	29.71	22 – 45
	43.2±9.9	70.7±10	29±6
		t=0.77	t=5.07
		p>0.05	p<0.0001**

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Figure (5): comparison between LAD, RVD, and IVSD of group I to group II and III.
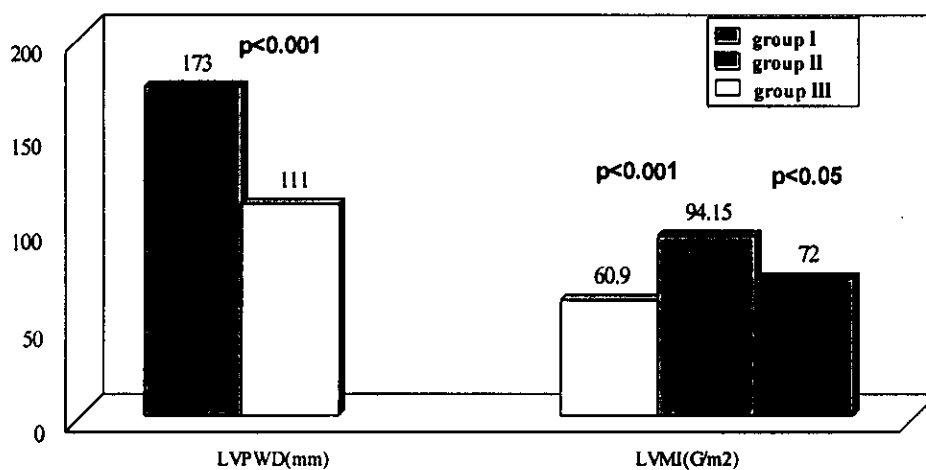

Figure (6): Comparison between LVPWD and LVMI of group I to group II and III.
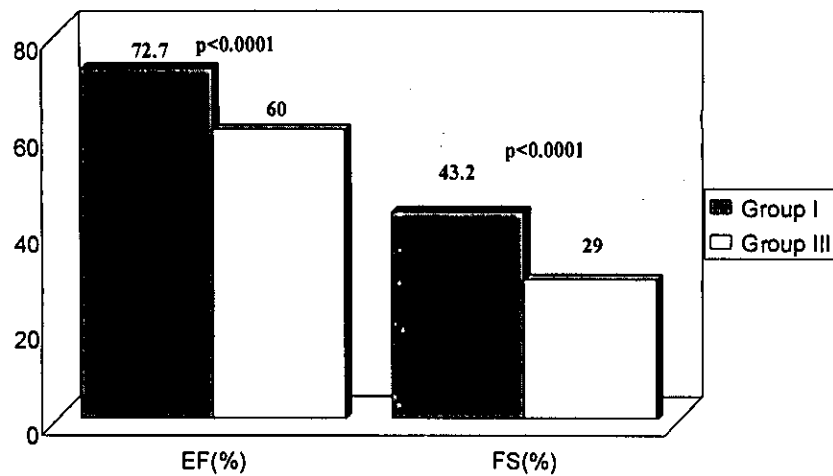
Figure (7): Comparison between EF and FS of group I to group II and III.

Table (16) shows highly a significant increase in LAD, IVSD, LVPWD, IRT and FS in patients of group II in comparison to those of group III (figure 8).
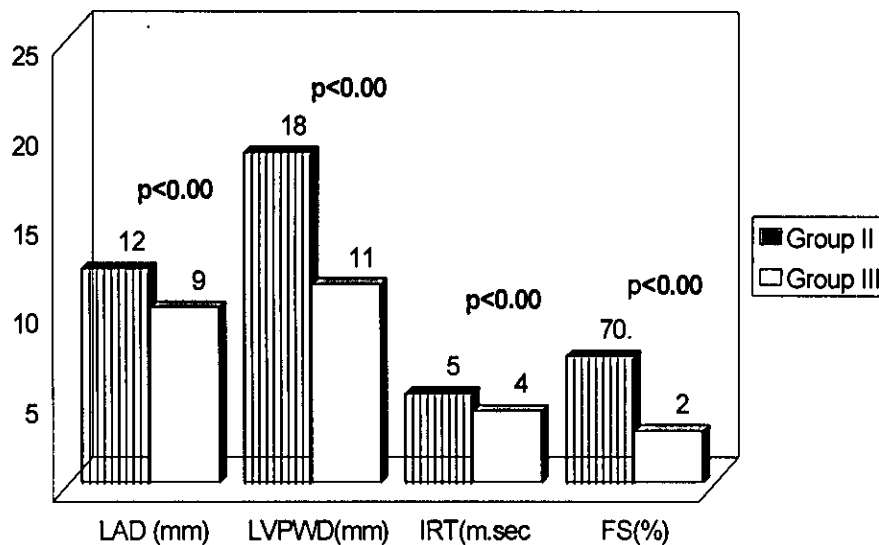

Figure (8): Comparison between LAD, LVPWD, IRT and FS of group II to group III.

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Table (16): Comparison of the ECHO findings of group II to group III.

Findings	Group II	Group III
LAD (mm)	85 – 159 120±17	82 – 125 98±14 t=4.84 p<0.001**
RVD (mm)	56 – 145 105±28.5	76 – 129 109±16.7 t=0.48 p>0.05
IVSD (mm)	58 – 395 156±65	83 – 139 113±17.2 t=2.86 p<0.001**
LVPWD (mm)	123 – 255 185±32	75 – 135 111±16.1 t=2.18 p<0.0001**
LVDD (mm)	68 – 128 95±16.8	71.5 – 104 92.5±6.7 t=0.78 p>0.05
LVMI (G/m²)	29 – 138 72±37.6	43 – 88 60.9±13.9 t=1.23 p>0.05
IRT (m.sec.)	23 – 77 50±11.4	31.46 40±6.1 t=3.36 p<0.0001**
ICT (m.sec.)	38 – 338 58±66	41 – 54 50±4.5 t=0.55 p>0.05
EF (%)	6 – 86 64±17.7	45 – 73 60±8.1 t=0.96 p>0.05
FS (%)	29.71 70.7±10	22 – 45 29±6 t=4.11 p<0.0001**

The mean value of serum CTnI was significantly high in groups I (p<0.0001) and II (p<0.0001) compared to group III. Meanwhile, there was no significant difference on comparing groups I to group II (p>0.05) (figure 9).
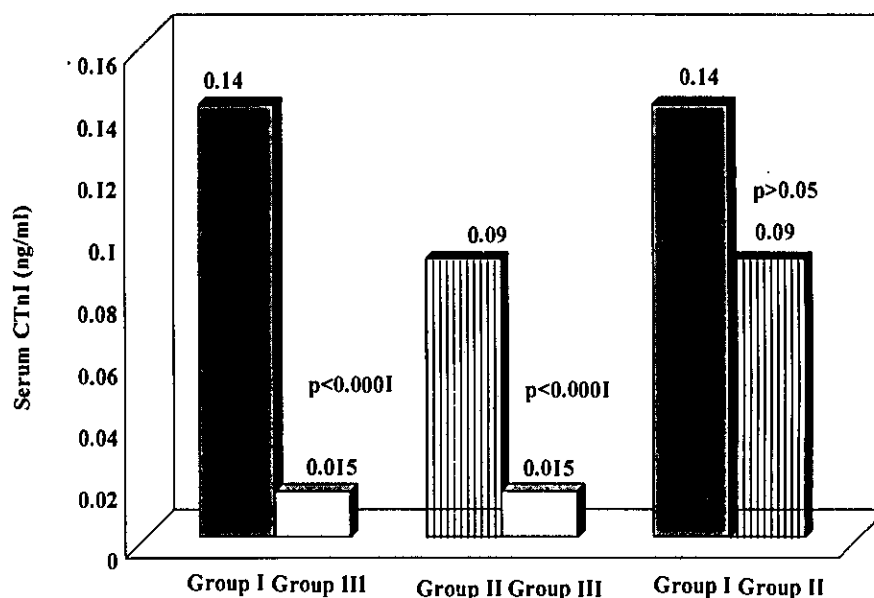

Figure (9): Comparison between the studied groups regarding the mean serum value of CTnI.

Regarding the correlation between ECHO findings and clinical as well as chemical profiles in patients of the studied groups, there was only a significant negative correlation between blood urea and FS in group I (**r = 0.46, P<0.05**). We also failed to detect any significant relation between ECHO findings and X-ray findings and ECG in all of the studied groups (**P>0.05**).

Table (17): Comparison between the mean value of serum CTnI in patients with and without manifestations suggestive of myocardial damage among group I.

Manifestations	Patients with suggestive manifestations	Patients without suggestive manifestations	t-test	p
Muffled heart sounds	0.21 ± 0.18	0.09 ± 0.03	2.07	>0.05
Gallop rhythm	0.22 ± 0.12	0.12± 0.13	1.36	>0.05
Dyspnea	0.18 ± 0.15	0.13 ± 0.13	0.62	>0.05
Chest pain	0.20 ± 0.27	0.13 ± 0.09	0.9	>0.05
Systemic venous congestion	0.1 ± 0.15	0.13 ± 0.12	0.46	>0.05

Table (17) shows increased mean values of serum CTnI in patients of group I with manifestations suggestive of myocardial damage in comparison to those without. Yet, these differences were statistically non-significant **(P > 0.05)**.

Table (18): Comparison between the mean value of serum CTnI in patients with and without manifestations suggestive of myocardial damage among group II.

Manifestations	Patients with suggestive manifestations	Patients without suggestive manifestations	t-test	p
Muffled heart sounds	0.09 ± 0.05	0.09 ± 0.02	2.07	>0.05
Gallop rhythm	0.11 ± 0.06	0.08 ± 0.03	2.07	>0.05
Dyspnea	0.10 ± 0.06	0.09 ± 0.02	0.70	>0.05
Chest pain	0.14 ± 0.06	0.08 ± 0.02	2.65	<0.02 *
Systemic venous congestion	0.15 ± 0.07	0.08 ± 0.02	2.90	<0.01 *

Table (18) shows increased mean values of serum CTnI in patients of group II with manifestations suggestive of myocardial damage in

comparison to those without except regarding the muffling of heart sounds. Yet, these differences were statistically significant as regards the patients with chest pain **(p<0.02)** and systemic venous congestion **(P <0.01).**

There was a significant negative correlation between serum CTnI and duration of HD treatment in patients of group I **(r = - 0.35, p<0.05).** There was also a significant negative correlation between serum CTnI and the duration of CRF in patients of group II **(r = - 0.09, p<0.05).** The study revealed a significant positive correlation between serum CTnI and diastolic BP in patients of group I **(P< 0.05)** (figure 10). Meanwhile, there was no significant correlation between CTnI and any of the components of the chemical profile, X-ray findings and ECG in all of the studied groups **(P>0.05).**

CTnI vs. DBP
r = .48003   p<0.05
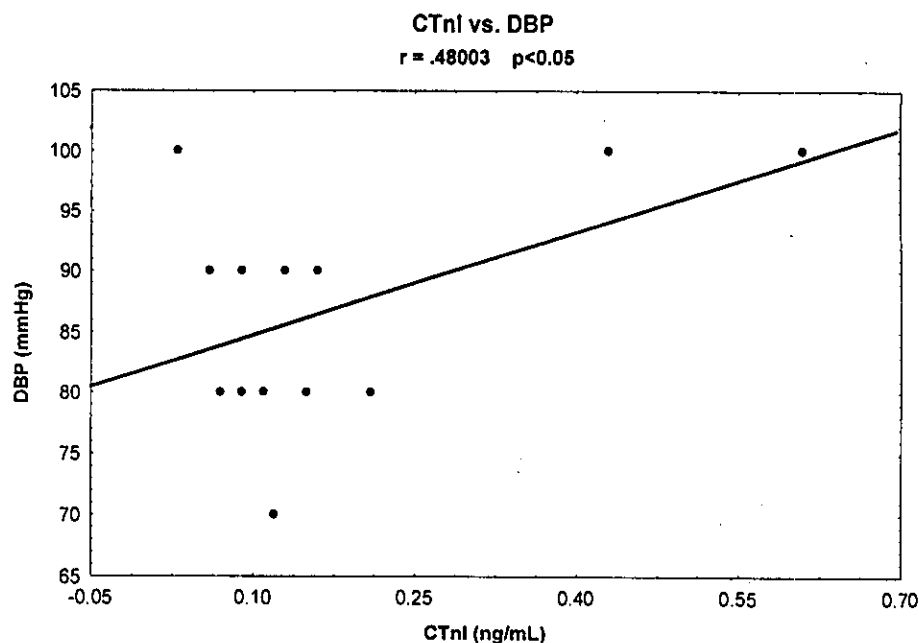
Figure (10): Correlation between serum CTnI and DBP in patients of group I.

There was significant positive correlation between serum CTnI and EF in group I **(P < 0.05)** (figure 11). Also, there were significant positive correlation between serum CTnI and IVSD, LVPWD, LVMI and EF in patients of group II **(P < 0.05)** (figures 12, 13 & 14).
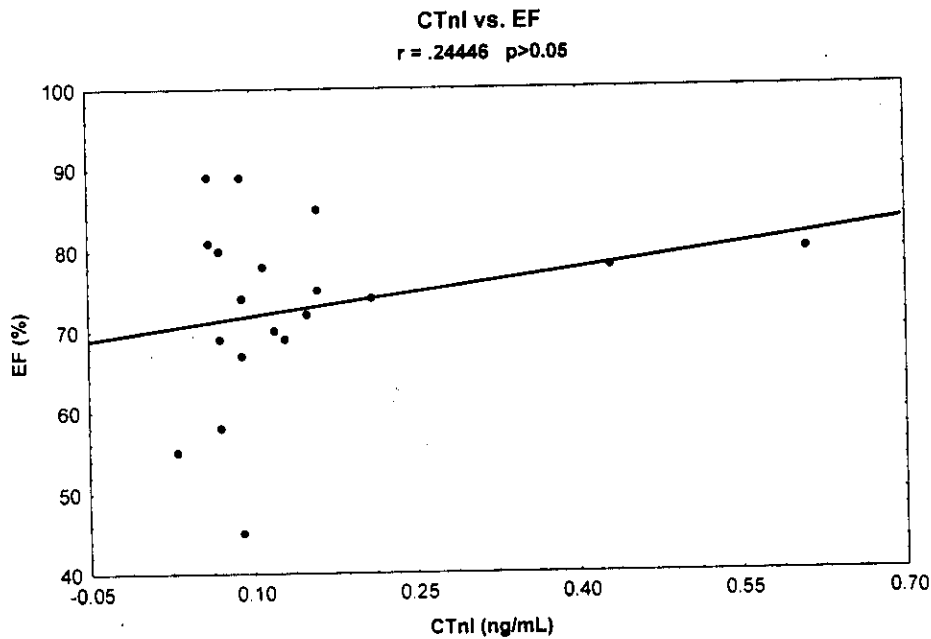
CTnI vs. EF
r = .24446   p>0.05

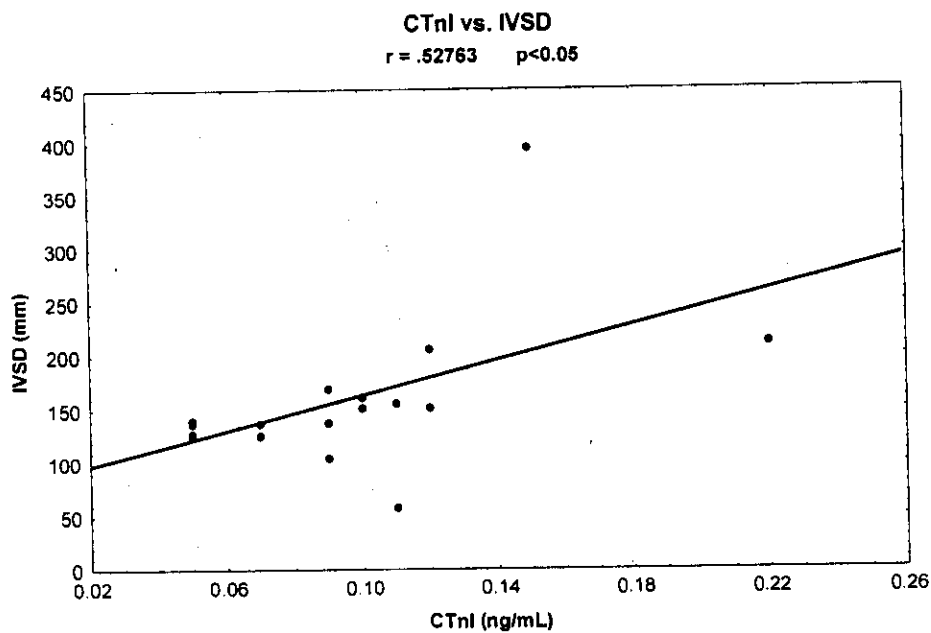**Figure (11):** Correlation between serum CTnI and EF in patients of group I.

CTnI vs. IVSD
r = .52763   p<0.05

Figure (12): Correlation between serum CTnI and IVSD in patients of group II.

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CTnI vs. PVWD
r = .49591   p<0.05
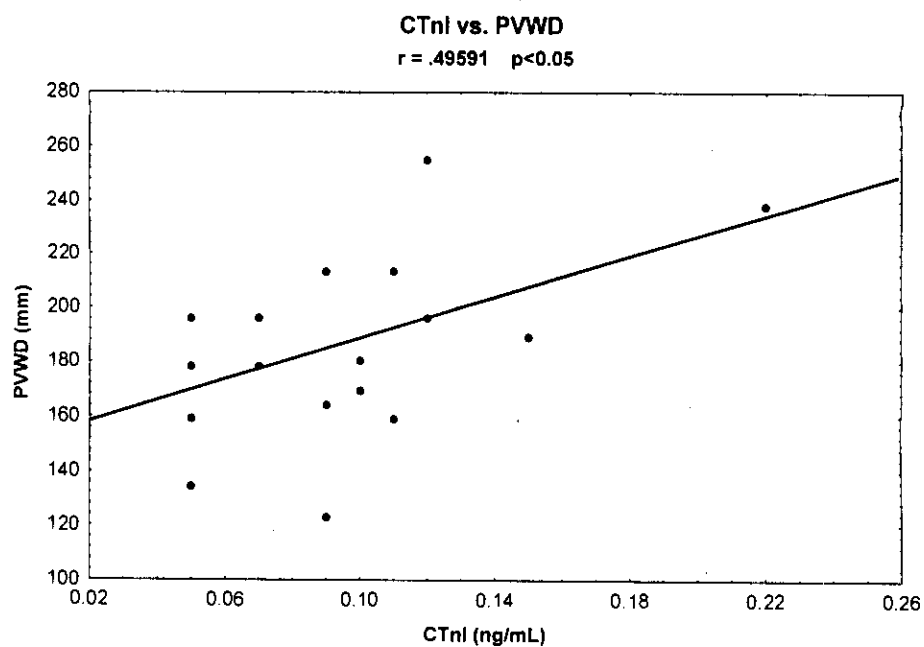
Figure (13): Correlation between serum CTnI and LVPWD in patients of group II.

CTnI vs. LVMI
r = .61239   p<0.05
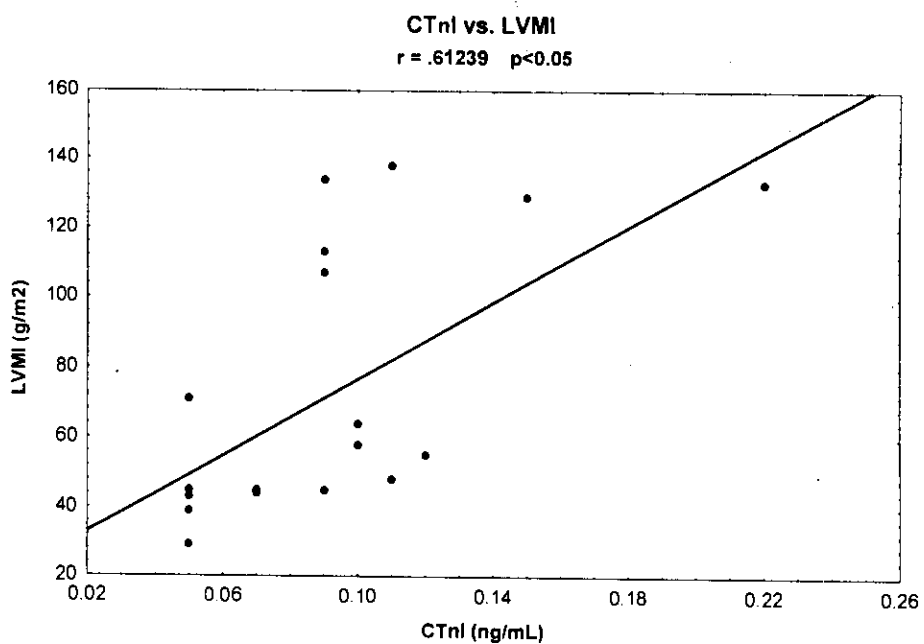
Figure (14): Correlation between serum CTnI and LVMI in patients of group II.

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Figure (15):Chest X-ray of 15 years old male patient with CRF shows cardiomegaly (left ventricular enlargement) and pulmonary congestion.

Figure (16): Chest X-ray of 12 years old male patient with CRF
shows cardiomegaly (left ventricular enlargement) and
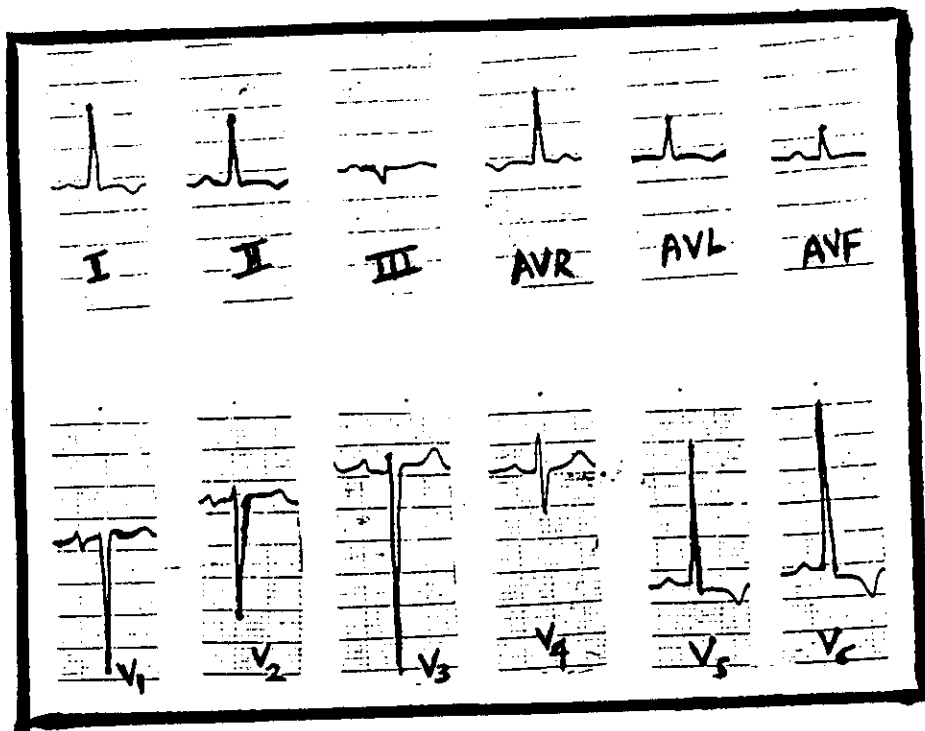pulmonary artery dilatation.

Figure (17): Resting ECG of 14 years old female patient with CRF shows evidence of left ventricular hypertrophy.
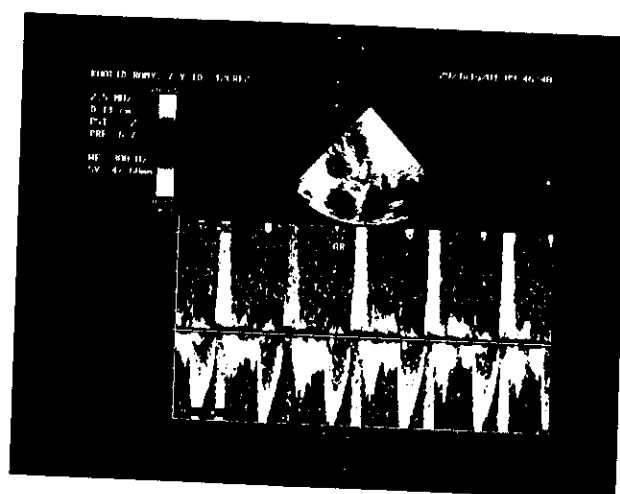
Figure (18): Echocardiography of 15 years old male patient with CRF shows A.R.
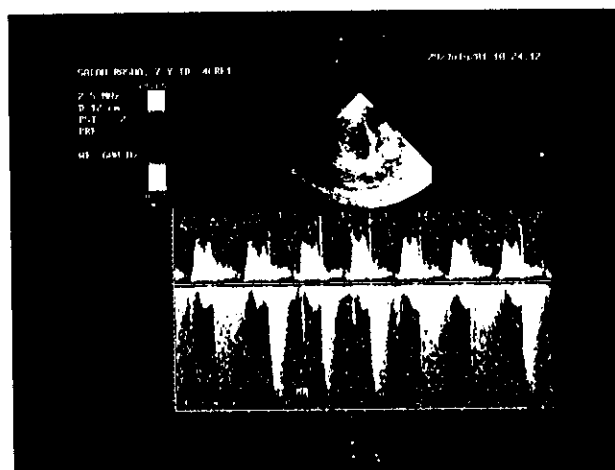
Figure (19): Echocardiography of 13 years old female patient
with CRF shows MR .