RESULTS

After analysis of the clinical, laboratory and non invasive cardiovascular techniques, the patients were divided into 2 main groups as in table (1).

I- Rheumatic group

This group included ten patients, constituting 25% of all Mitral valve disease cases.

II- Congenital group

This group included 30 patients, constituting 75% of patients with mitral valve disease.

Table (1):

Type of mitral valve lesion		Number of cases	%
Congenital group	Congenital mitral regurgitation	10	25%
	Congenital mitral stenosis	3	7%
	Congestive cardiomyopathy	6	15%
	Cleft mitral valve	4	10%
	Mitral valve prolapse	7	18%
Rheumatic group	Rheumatic valve disease	10	25%

- Correlation between age, sex and weight were shown in tables (2), (3), (4),(5) and (8).

I- Rheumatic group

In this work 10 patients with rheumatic mitral valve disease were detected. They constituted 25% of all patients with mitral valve disease. Their ages ranged from 4-5 years, 6 females and 4 males. Growth as measured by weight and height was between 50-90th centile.

*** The main presenting symptoms were shown in table (6) :**

This table shows that dyspnea was present in 10 patients 100%, cough in 4 patients 40%, repeated chest infection and easy fatiguability in 2 patient 20%, repeated tonsillitis in 1 patient 10% and chorea in 1 patient 10%.

*** The main clinical signs were shown in table (7) :**

There was precordial bulge in 1 patient 10%, palpabile apical systolic thrill in 5 patients 50%, signs of left ventricular hypertrophy in 1 patient 10%, signs of right ventricular hypertrophy in 1 patient 10%, signs of pulmonary hypertension in 4 patients 40% and clinical evidence of heart failure in 5 patients 50%. The 1st heart sound was muffled in 8 patients 80% and normal in 2 patients 20%,these two patients had double mitral lesions. The second heart sound over pulmonary area was accentuated in 4 patients 40% indicating pulmonary hypertension.

Pansystolic apical murmur propagated to axilla was heard in all 10 patients 100%, mid diastolic rumbling apical murmur of mitral stenosis was heard in 2 patients 20% and early diastolic murmur over the 2nd aortic area denoting aortic regurgitation was heard in 3 patients 30%.

The main laboratory findings were put in table (9) :

and showed increase ESR and increase ASOT in all 10 patients, mild aneamia and normal leucocytic count in all 10 patients 100% and positive CRP in 6 patients 60%.

The ECG findings as presented in table (10):

Showed P.mitral indicating left atrial hypertrophy in 7 patients 70%, P. pulmonal in 1 patient 10% indicating right atrial hypertrophy, left ventricular hypertrophy in 1 patient 10%, right ventricular hypertrophy in 2 patients 20% and biventricular hypertrophy in 1 patient 10%.

Radiological findings as presented in table (11) :

Showed evidence of cardiomegaly in 5 patients 50%. The C:T ratio ranged from 50%-70%, the normal C:T ratio for age was 0.492 $\pm$ 0.024. Pulmonary vasculature increased in 8 patients 80%.

Echocardiographic findings :

Revealed a significant increased in the mean measurements of the left atrium and left ventricular end

diastolic dimension in all patients 100%. Rupture chordae tendineae in 3 patients 30%. Doppler echo. showed mitral regurgitation in all patients 100% mitral regurgitation with aortic regurgitation in 3 patients 30%. Tricuspid regurgitation presented with mitral regurgitation in 3 patients 30%, and pulmonary regurgitation was present in 2 patients 20%. Echo findings were shown in table (12), (13), (14).

Congenital mitral regurgitation

Ten patients with congenital mitral regurgitation constituting 33% of the congenital cases were detected in this work. Their ages ranged from 2 months 5 ys, 4 females and six males. Growth was between 3rd-50th centile.

The presenting symptoms table (6) :

The main presenting symptoms were dyspnea in 8 patients 80%, cough in 9 patients 90%, cynosis in 3 patients 30%, easy fatigaubility in 3 patients 30%, recurrent chest infection in 2 patients 20% and pallor in 1 patient 10%.

The main clinical signs table (7) :

The main clinical signs included precordial bulge in 3 patients 30%, central cyanosis in 3 patients 30%, 2nd degree clubbing in one patient 10%. Signs of left ventricular hypertrophy in 5 patients 50%, and signs of congestive heart failure in 4 patients 40%. Signs of right ventricular hypertrophy in 4 patients. Palpable apical thrill (systolic) was felt in 8 patients 80%. Signs of pulmonary hypertension were present in 2 patients 20%.

1st heart sound was muffled in 7 patients 70% and normal in 3 patients 30%, 2nd heart sound was accentuated in 2 patients 20%.

Harsh pansystolic apical murmur propagated to axilla was heard in 9 patients 90% and left parasternal pansystolic murmur of V.S.D was heard in 5 patients 50%.

E.C.G. findings table (10) :

Main findings were tachycardia in 9 patients 90%, P. mitral in 3 patients 30%, P. pulmonal in 2 patients 20%, L.V.H. in 5 patients 50% and R.V.H. in 7 patients 70%.

Radiological findings showed cardiomegaly in 7 patients 70%, C.T. ratio ranged from 50%-60% pulmonary vasculature increased in 7 patients 70% and decreased in 3 patients 30% who had pulmonary stenosis table (11).

Echocardiographic findings revealed significant increase in the mean dimensions of left atrium in 3 patients 30%, increase in left ventricular end diastolic volume and left ventricular posterior wall thickness in 5 patients 50%. EF% was normal in all patients 100%. Also echo. detected V.S.D in 5 patients, A.S.D in 4 patients 40%, and other congenital anomalies as truncus arteriosus in 1 patient 10%, hypoplastic left ventricle and hypoplastic mitral valve in 1 patient.Eisinmenger syndrome in 1 patient 10%, T.G.A., a P.D.A. and C.O.A. in one patient 10%. Doppler findings showed mitral regurgitation in all patients 100%, associated tricuspid regurgitation in one patient 10% and pulmonary regurgitation in one patient 10% tables (12), (13) and (15).

Cleft mitral valve

Atrioventricular canal with cleft mitral valve was detected in 4 patients. Constituting 13% of the all congenital cases. Their age ranged from 6 months-5 ys, two males and two females. One case 25% of them was Down Syndrome. Growth was between 3rd-50th centile.

The presenting symptoms table (6) :

The main symptoms were dyspnea in 3 patients 75%,cough in 1 patient 25%, easy fatigaubility in 3 patients 75%, cyanosis in 1 patient 25%, recurrent chest infection in 1 patient 25% and feeding difficulties in 1 patient 25%.

Clinical signs table (7) :

The main signs included, signs of heart failure in 2 patients 50%, signs of cardiomegaly in 3 patients 75%. Palpable apical systolic thrill in one patient 25% and clubbing 2nd degree in one patient 25%. 1st heart sound was muffled in all cases 100%. 2nd heart sound was accentuated in 3 patients 75% and signs of pulmonary hypertension in 3 patients 75%. Pan systolic murmur over the apex, propagated to axilla was heard in all patients 100%, pansystolic murmur over left parasternal border was heard in two patients 50%.

ECG findings table (10) :

Showed P. mitral in 1 patient 25%, P. pulmonal in 3 patients 75%, L.V.H. in 1 patient 25% and R.V.H. in 3 patients 75%.

Radiological findings showed cardiomegaly in 3 patients 75%. C.T ratio ranged from 50-60%. Increased vascularity was detected in 3 patients 75%. The fourth patient had oligemic lung due to pulmonary stenosis table (11).

Echocardiographic findings revealed atrioventricular canal in all patients 100%. Two of them 50% were complete atrioventricular canal and the other two 50% were partial atrioventricular canal. All have cleft mitral valve 100% V.S.D. was present in two cases 50%. Ostium primum in all cases 100%. Cleft tricuspid valve was present in two cases 50%. Doppler findings showed mitral regurgitation in all 4 patients 100% and associated tricuspid regurgitation in 3 patients 75% tables (12), (13),(16).

Congestive cardiomyopathy

Six patients constituting 20% of the congenital cases in this work were presented by dilated cardiomyopathy. Their age ranged from 1.5 y 3.5 y, 2 females and 4 males. Growth was between the 3rd and 50th centile.

The main symptoms table (6) :

The main symptoms were cough in 6 patients 100%, dyspnea in 6 patients 100%, cyanosis in 3 patients 50%, pallor in 1 patient 16% and oedema in 1 patient 16%.

Clinical signs table (7) :

The main signs included signs of heart failure in all patients 100%, epigastric pulsation in all patients 100% palpable apical systolic thrill in 4 patients 66%. 1st heart sound was muffled in all patients 100%. Pan systolic murmur of different grades propagated to axilla was heard over the apex in all patients 100%.

ECG findings table (10) :

Showed P. mitral in 6 patients 100%, L.V.H in 6 patients 100% and R.V.H in 3 patients 50%.

Radiological findings showed evidence of cardiomegaly and increased vasculature in all patients 100%. The C:T ratio ranged from 55-70%. Table (11).

Echocardiographic findings showed significant increase in the mean measurements of left atrium, left ventricular

end diastolic dimension and left ventricular post. wall thickness in all patients 100%, Fixed thrombi to the left ventricular wall in 2 patients 33% and significant increase in the mean of right ventricle. There was significant decrease of the fractional shortening signified a reduced myocardial contractility in all patients. Also decreased SV and EF in all patients 100% were present. Colour Doppler echocardiography showed mitral regurgitation of different grades in 6 patients 100%, associated tricuspid regurgitation in 3 patients 50%, Aortic regurgitation in 1 patient 16% and pulmonary regurgitation in 3 patients 50% tables (12),(13) and (17).

Mitral valve prolapse

In this work, 7 patients 23% of the congenital cases presented with mitral valve prolapse, their age ranged between 1.5-4.5 ys. Six females and one male. Growth was between 25th-90th centile.

The main presenting symptoms table (6) :

The main symptoms were dyspnea in 3 patients 43%, cough in 2 patients 29%, easy fatigaubility in 2 patients 29% and repeated chest infection in 2 patients 29%.

The main clinical signs table (7) :

The main signs were cyanosis in 1 patient 14%, clubbing in 1 patient 14%, signs of heart failure in 2 patients 29%. 1st heart sound was muffled in 3 patients 43% and normal in 4 patients 57%-2nd heart sound was normal in 6 patients 86% and muffled in 1 patient 14% pansystolic murmur over apex propagated to axilla in 1 patient 14%, late systolic murmur over apex in 3 patients 43% and mid systolic click heard in 2 patients 29%. Left parasternal pansystolic murmur of V.S.D in 4 patient 57%.

E.C.G findings showed right ventricular hypertrophy in 3 patients 43%. Left ventricular hypertrophy in 2 patients 29%. P. mitral in 2 patients 29% and P. pulmonal in 1 patient 14%, this patient had tricuspid atresia. Table (10).

Radiological findings showed cardiomegaly in 4 patients 57%. C.T ratio ranged from 55-65%. Increased vascular markings were seen in 4 patients 57% table (11).

Echocardiographic findings showed myxomatus degeneration of mitral valve in one patient 14%. Significant increase in left ventricular end diastolic volume and left ventricular post. wall thickness FS% was normal in all patients. Doppler findings showed presence of mitral regurgitation in 4 patients and associated tricuspid regurgitation in 1 patient 14% table (12), (13), (18).

Congenital mitral stenosis

Three patients of congenital mitral stenosis, constituting 10% of the congenital cases were detected in this work.Their ages ranged from 3 months-3.5 ys 2 females and one male.One case was lutembacher syndrome. The growth was between 3rd-50th. Centile.

The main presenting symptoms as shown in table (6) :

Were dyspnea in 3 patients 100% and each of cough, rapid heart rate, anorexia and repeated chest infection in one patient 33%.

Main clinical signs table (7) :

The main clinical signs were,signs of left ventricular hypertrophy in 1 patient 33%. Signs of heart failure in one patient 33%.

1st heart sound accentuated in 2 patients 58% and diminished in 1 patient 33% the 2nd heart sound accentuated in 2 patients 66% and normal in 1 patients 33%. Rumbling mid diastolic murmur was heard over the apex in all patients 100%. Pan systolic murmur was heard over the apex and propagated to axilla in 2 patients 66%.

E.C.G. findings table (10) :

The main findings were P. mitral indicating left atrial enlargement in 3 patients 100%, P. pulmonal indicating right atrial enlargement in 1 patient 33%, L.V.H in 1 patient 33% and R.V.H. in 2 patients 66%.

Radiological findings showed evidence of cardiomegaly in 2 patients 66%. Increase vascularity of the lung in all patients 100%. C.T ratio ranged from 50-55% table (11).

Echocardiographic main findings included decrease in the mitral valve area than normal, short chordae and ventricular septal leaflets. Also there was decreased EF slope. Ventricular septal defect in one patient and Atrial Septal defect in two patients were detected. There was one papillary muscle in one patient. Doppler findings showed associated mitral regurgitation in 3 patients 100%, tricuspid regurgitation in 1 patient 33% and pulmonary regurgitation in 1 patient 33% tables (12), (13), (19).

Table (2): Distribution of studied cases according to age.

	Rheumatic group No : 10	Congenital group No.: 30
$\bar{X}$	4.65	2.26
SD	0.47	1.39
t	8.12	
p	< 0.001	

P <0.001 = very significance.

Table (3): Distribution of the studied cases according to sex.

Sex	Rheumatic group No. : 10	Congenital group No.: 30	Total
Males	4	14	18
Females	6	16	22
Total	10	30	40

X^2 = 0.135
P >0.05 = Non significance

Table (4): Distribution of studied cases according to weight (in kgm).

	Rheumatic group No : 10	Congenital group No.: 30
$\bar{X}$	17.4	10.4
SD	1.58	4.1
t	7.9	
p	< 0.001	

P <0.001 = very significance.

Table (5): Correlation between age in years and weight in kgm in studied cases.

	Age	Weight	r	P	Signifi-cance
Rheumatic group	X = 4.65 SD = 0.47	X = 17.4 SD = 1.58	0.72	< 0.05	S
Congenit-al group	X = 2.26 SD = 1.39	X = 17.4 SD = 4.1	0.88	< 0.05	S

X = Mean
SD = standard deviation
r = correlation coefficient
p = probability
S = significance

Table (6): Main symptoms in the studied cases.

Main symptoms	Rheumatic group		Congenital group		X^2	P
	No : 10	%	No : 30	%		
Dyspnea	10	100	23	76	2.87	>0.05
Cough	4	40	19	63	1.68	>0.05
Rapid heart rate	5	50	1	3	12.81	<0.05
Repeated chest infection	2	20	6	20	-	-
Easy fatigue	2	20	8	27	0.19	>0.05

P = >0.05 = Non significance

P = <0.05 = significance

Table (7): The main signs in the studied cases.

Main signs	Rheumatic group		Congenital group		X^2	P
	No : 10	%	No : 30	%		
Precordial bulge	1	10	3	10	-	-
Apical systolic thrill	5	50	13	43	0.15	>0.05
Signs of pulmonary hypertension	4	40	5	17	2.33	>0.05
Signs of heart failure	5	50	15	50	-	-
Muffled 1st heart sound	8	80	21	70	0.37	>0.05
Accentuated 2nd heart sound	4	40	7	23	1.05	>0.05
Apical pansystolic murmur of M.R	10	100	25	83	1.67	>0.05
Apical rumbling murmur of M.S	2	20	3	10	0.68	>0.05
Other murmurs	3	30	11	36	0.14	>0.05

X^2 = Chi - square

P >0.05 = Non significance

<0.05 = significance

Table (8): Correlation between age in years and heart rate in studied cases.

	Age	Heart rate	r	P	Significance
Rheumatic group	X = 4.65 SD = 0.47	X = 115 SD = 30.6	0.10	> 0.05	NS
Congenital group	X = 2.26 SD = 1.39	X = 128 SD = 23.1	0.47	< 0.05	S

Table (9): The main laboratory investigations. In ten patients with rheumatic valve disease.

The main clinical signs	Number of patients	%
- Increased ESR	10	100
- Increased ASOT	10	100
- Mild aneamia	10	100
- Normal leucocytic count	10	100
- Positive (+ve) CRP	6	60

Table (10): Main ECG finding in studied cases.

Main finding	Rheumatic group		Congenital group		X^2	P	Signif
	No : 10	%	No : 30	%			
P. mitral	7	70	15	50	1.22	>0.05	NS
P.pulmonal	1	10	7	23	0.84	>0.05	NS
L.V.H.	1	10	15	50	5	<0.05	S
R.V.H.	2	20	18	60	4.8	<0.05	S

X^2 = Chi square

P = probability

NS = Non significant

S = significant

Table (11): Main radiological findings in studied cases.

	Rheumatic group		Congenital group		X^2	P	Signif
	No : 10	%	No : 30	%			
Cardiomegaly	5	50	22	73	1.85	>0.05	NS
Increase vasculture	8	80	23	76	0.05	>0.05	NS

P >0.05 = NS : Non significance.

Table (12): Echo. findings in 40 patients with mitral valve disease.

Heart lesions No. of cases		Mitral valve area cm^2	Left atrium cm	LVEDD	LVPW	EDV ml/m^2	EF%	FS%
Normal values		3.6 cm^2	1.72	3.28	0.49	73 ± 11	65-85	25-45
Rheumatic group No : 10	Mean	3.8	3.9	4:5	0.6	132	67	31
	P	>0.05	<0.05	<0.05	>0.05	<0.05	>0.05	>0.05
Congenital group Cong. MR No : 10	Mean	3.4	2.8	4.1	0.65	91	68	35.6
	P	>0.05	<0.05	<0.05	<0.05	>0.05	>0.05	>0.05
Congestive cardi-omyopathy No : 6	Mean	3.6	2.7	5.1	0.7	160	44	16.5
	P	>0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cleft mitral valve No : 4	Mean	3.8	1.4	3.1	0.5	85	82	41
	P	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05
Congenital MS No : 3	Mean	1.9	3.3	2.8	0.6	79	55	25
	P	<0.05	<0.05	>0.05	>0.05	>0.05	>0.05	>0.05
M.V.P. No : 7	Mean	3.5	2.1	0.45	0.45	86	80	28
	P	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05

P = > 0.05 = Non significance
P = < 0.05 = significance
EF = Ejection fraction
FS = Fraction shortening

Table (13): Associated affected valves in studied mitral valve disease cases.

Valve affected	Rheumatic group		Congenital group		X^2	P
	No : 10	%	No : 30	%		
Mitral	10	100	30	100	-	-
Tricuspid	3	30	9	30	-	-
Aortic	3	30	1	3	5.92	<0.05
Pulmonary	2	20	5	17	0.05	>0.05

P >0.05 = Non significant

P <0.05 = significance

Table (14): Doppler findings in ten rheumatic patients.

Volume regurgitation	Number of patients	Gr. I	Gr.II	Gr.III
Mitral regurgitation	10	-	3	7
Tricuspid regurgitation	3	-	3	-
Aortic regurgitation	3	1	2	-
Pulmonary regurgitation	2	2	-	-

Table (15): The main echo doppler findings.In ten patients with congenital mitral regurgitation.

Volume regurgitation	Total No.	Gr. I	Gr.II	Gr.III
Mitral regurgitation	10	3	6	1
Aortic regurgitation	-	-	-	-
Tricuspid regurgitation	1	-	1	-
Pulmonary regurgitation	1	1	-	-

Table (16): The main echo doppler findings. In 4 patients with cleft mitral valve.

Volume regurgitation	Total No.	Gr. I	Gr.II	Gr.III
Mitral regurgitation	4	1	2	1
Aortic regurgitation	-	-	-	-
Tricuspid regurgitation	3	-	2	1
Pulmonary regurgitation	-	-	-	-

Table (17): The main echo doppler findings. In 6 patients with dilated cardiomyopathy.

Volume regurgitation	Total No.	Gr. I	Gr.II	Gr.III
Mitral regurgitation	6	1	2	3
Aortic regurgitation	3	-	2	1
Tricuspid regurgitation	1	1	-	-
Pulmonary regurgitation	3	1	1	1

Table (18): The main echo doppler findings. In 7 patients with M.V.P.

Volume regurgitation	Total No.	Gr. I	Gr.II	Gr.III
Mitral regurgitation	4	1	2	1
Aortic regurgitation	-	-	-	-
Tricuspid regurgitation	-	-	-	-
Pulmonary regurgitation	1	1	-	-

Table (19): The main echo doppler findings. In 3 patients with congenital mitral stenosis.

Volume regurgitation	Total No.	Gr. I	Gr.II	Gr.III
Mitral regurgitation	3	-	1	2
Aortic regurgitation	-	-	-	-
Tricuspid regurgitation	1	-	-	1
Pulmonary regurgitation	1	-	1	-