

Echocardiography at TU Teaching Hospital (TUTH) - One Year Study

¹ Arun Sayami² B K M Singh³ G P Acharya

A retrospective analysis of 542 patients who had echocardiography done in TUTH for a period of one year were included in the study. It has been found that 55% of the patients had some abnormal echo findings. The commonest cardiac problem was Rheumatic heart disease which accounted for 50% of total positive cases and about half the patient with Rheumatic heart disease had mitral stenosis.

INTRODUCTION

Echocardiography is one of the most important diagnostic tool in modern cardiology. As this is noninvasive and inexpensive, it is one of the most essential diagnostic techniques which can be applied in poor country like Nepal. In this study only two dimensional (2D) and M mode echocardiography findings are discussed. These techniques have some limitations in valvular regurgitation and complex congenital heart disease, which are over come by doppler and colour doppler echocardiography.¹ However doppler and colour doppler systems are expensive.

MATERIALS AND METHODS

A total of 542 patients had 2D and M mode echocardiography done in TUTH from January 1991 to December 1991. The data of these patients was analysed. The patients were referred from various departments of

Teaching Hospital, Bir Hospital, Patan Hospital and from zonal and district hospitals.

RESULT

Out of 542 patients examined 55% had abnormal echo findings and 45% had normal echo findings. Fifty five percent of patients were male and forty five percent were female.

Total Cases:	542
Normal findings:	245 (45%)
Abnormal findings:	297 (55%)

The echocardiographic findings of heart disease are given in Table 1.

It has been found that Rheumatic heart disease (RHD) accounts for 50% of cardiac problems in this study. Among other acquired heart diseases hypertensive heart disease (11%), pericardial effusion (9%) and cardiomyopathy (9.1%) are important. Among 27 cases of cardiomyopathy 25 had Dilat

1 MD (Cardiology). Lecturer, Dept of Medicine, Teaching Hospital.

2 MD, DM (Cardiology). Reader, Dept of Medicine, Teaching Hospital.

3 FRCP. Professor, Dept of Medicine, Teaching Hospital.

Cardiomyopathy (DCM) and 2 had Hypertrophic Cardiomyopathy (HCM).

Name of Heart Disease	Total Case	Male	Female
1. Rheumatic	148 (50%)	72	76
2. Hypertensive	34 (11%)	22	12
3. Pericardial effusion	29 (9%)	17	12
4. Cardiomyopathy	27 (9.1%)	15	12
5. Cor pulmonale	16 (5.3%)	10	6
6. Ischaemic	14 (4.7%)	12	2
7. MVP	2 (0.6%)	1	1
8. LA myoma	1 (0.3%)	1	0
9. Congenital	26 (10%)	14	12

Table 1: Echocardiographic Diagnosis of Cardiac Diseases

Out of 148 cases of Rheumatic heart disease the disease pattern and the sex distribution is given in Table 2.

Valvular Involvement	Total Case	Male	Female
1. Mitral Stenosis (Isolated)	52	16	36
2. Mitral Regurgitation (Isolated)	31	9	22
3. Aortic Stenosis (Isolated)	10	9	1
4. Aortic Regurgitation (Isolated)	13	13	0
5. Aortic Stenosis with Aortic Regurgitation	3	3	0
6. Mitral Stenosis with Mitral Regurgitation	11	5	6
7. Mitral Valve Disease with Aortic Valve Disease (11 had MS 5 had MR)	19	12	7
8. Mild Rheumatic Changes only	9	5	4
Total Case	148	72	76

Table 2: Valvular Involvement and Sex Distribution Rheumatic Heart Disease

		Mitral Stenosis (MS)	Mitral Regurgitation (MR)
1.	Total Case	74	47
2.	Isolated MS or MR	52	31
3.	MS + MR	11	11
4.	With Aortic Valve Disease	11	5
5.	Male	28	14
6.	Female	46	33

Table 3: Pattern of Mitral Valvular Disease

From the table 2 and 3, it is seen that out of 148 patients suffering from Rheumatic heart disease, 74 (50%) had mitral stenosis and 47 (31%) had mitral regurgitation. The incidence of mitral stenosis and mitral regurgitation was significantly higher among female patients. Similarly, the incidence of aortic valve involvement was 30%, among which 13% were associated with mitral valve involvement. Hence 70% of only patients had only mitral valve involvement, 17% only aortic valve involvement and 13% had both aortic and mitral valve involvement.

Aortic valve involvement is significantly more in male ($n = 37$) as compared to female ($n = 8$).

Ten patients had functional tricuspid regurgitation.

Among 148 rheumatic heart disease patients, 14 (9.45%) had infective endocarditis. Vegetations were detected in 7 cases of aortic valve disease, 5 cases of mitral valve disease and 2 cases of mixed mitral and aortic valve disease. One patient with infective endocarditis had pure mitral stenosis.

The incidence of congenital heart disease is summarised in the table 4.

	Name of Disease	Total No.	Male	Female
1.	Atrial Septal Defect (ASD)	18	8	10
2.	Ventricular Septal Defect (VSD)	2	1	1
3.	Patent Ductus Arteriosus (PDA)	2	2	0
4.	Others	4	3	1

Table 4: Incidence of Congenital Heart Disease

Atrial septal defect (ASD) was the commonest congenital heart disease followed by VSD. The other congenital heart diseases were single ventricle (1), Ebsteins anomaly (1), Pulmonary stenosis (1), TGA with VSD (1).

DISCUSSION

Fifty five percent of the patients in whom echocardiography was done in TUTH, had some organic heart disease. Fifty percent of total positive cardiac case have Rheumatic heart disease. As Rheumatic heart disease is a preventable disease our effort should be in prevention and early diagnosis of this disease. 2D and M mode echo can detect Rheumatic involvement of cardiac valve in the early stage. Chronic valvular damage requiring surgery can be avoided with proper treatment at early stage.

It is found that 50% of patients from Rheumatic heart disease have mitral stenosis. Mitral stenosis in its earlier stage can be managed by medication and close heart surgery which is economic and can be done in our country. 2D and M mode echocardiography plays a very important role in management of mitral stenosis in our country. Patients with critical stenosis (MVO less than 1cm^2) are usually taken for close heart surgery if they do not have other contraindications.²

In this study the incidence of pericardial effusion was 9%. 2D and M mode echo are very sensitive test for diagnosis of pericardial effusion. It can detect even minimal pericardial effusion which can be easily missed by X-ray chest and fluoroscopy.³ Besides this, pericardial paracentesis can be done more safely under echocardiography.

Cardiomyopathy has been thought to be rare disease in our country. But in this study 9% of total echo positive cases had cardiomyopathy. Dilated Cardiomyopathy (8% of total echo positive cases) is the main cardiomyopathy in this study. The exact cause of this high incidence of Dilated Cardiomyopathy in our country is not known. As myocardial biopsy and coronary angiography could not be done, some of these cases may have ischaemic cardiomyopathy.

Among the congenital heart disease, ASD showed highest incidence in this study. ASD is the commonest congenital heart disease in adults.⁴ As most of cases of paediatric

congenital heart disease goes to Kanti Paediatric Hospital these problems are less frequently dealt in TUTH.

It has been found that 2D and M mode echo is is very important tools in diagnosis of rare diseases like cardiac tumours and mitral valve prolapse. Without this investigation, diagnosis of intracardiac tumour and mitral valve prolapse can be easily missed.

One of the very important role of 2D and M mode echocardiography is detection of vegetations inside the heart and confirming the diagnosis of infective endocarditis. Echocardiography is only means by which we can detect vegetations in living beings. However if vegetations are less than 2 mm they can be missed by echo.⁵ Detection of vegetations and confirmation of diagnosis of infective endocarditis in a short time helps us in management of this dreadful disease. In our 14 patients i.e. 9.4% of total valvular cases showed vegetation.

2D and M mode echo has important role in detection of severity and complications of coronary artery disease. By studying various wall motion abnormalities it can detect extent of myocardial infarction and complications like LV aneurysm and LV thrombus without applying invasive tests to the patient. In our study 2 patients showed LV aneurysm.

Limitation of 2D and M mode echo

2D and M mode echo are less reliable in diagnosis of valvular regurgitation. In this study valvular regurgitation were diagnosed by indirect means which are not completely reliable. Similarly it cannot detect severity of regurgitation which is essential before planning the patients for surgery. Similarly it cannot detect pressure gradient across the stenosed valve. The pressure gradient is very important data for knowing severity of stenosis which helps to decide whether patient requires surgical intervention or not. All these problems can be solved by Doppler and Colour Doppler echocardiography.

2D and M mode echo are less sensitive

for diagnosis of congenital heart disease. Some cases diagnosed as ASD may be due to false echo drop out.⁶ Small VSD can be easily missed. Only about 10% of PDA could be visualised by 2D and M mode echo.⁶ Many complex congenital heart diseases can be easily missed. These problems can be solved by Doppler and Colour Doppler echo.

Though 2D and M mode echo can help us in detecting wall motion abnormalities and complications like ventricular aneurysm, LV thrombus, and pericardial effusion, it cannot detect direct involvement of coronary artery.

The standard gold test for studying coronary artery disease is coronary angiography.

CONCLUSION

Though 2D and M mode echo has many limitations, it is very simple, noninvasive and inexpensive device which is very sensitive in diagnosis of many cardiac problems, e.g. mitral stenosis, pericardial effusion, infective endocarditis. Cardiomyopathy, intracardiac mass, LV aneurysm, MVP and other simple congenital heart diseases.

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Clinical Signs of Pneumonia in Children

Clinical and chest radiographic findings were recorded prospectively in 185 children with cough who attended an outpatient clinic in Papua New Guinea. Children were studied if they were between 8 weeks and 6 years of age; patients with wheeze, stridor, measles, or pertussis were excluded. 56 children (30%) had radiological evidence of pneumonia. The presence of either a respiratory rate $\geq 50/\text{min}$ or chest indrawing, or of both signs, was a good indication of pneumonia, with a predictive power of 46% for a positive test and 83% for a negative test. A more complex definition of tachypnea, as a respiratory rate $\geq 40/\text{min}$ in children over 12 months old and $\geq 50/\text{min}$ in infants, showed little additional diagnostic benefit.

- M Harari et al, reprinted Lancet, October 12, 1991, 338 (8772): 928-30.