



A RETROSPECTIVE ANALYSIS OF ECHOCARDIOGRAPHY IN PEDIATRIC AGE GROUP PATIENTS IN CENTRAL INDIA.

General Medicine

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ABSTRACT

Objective: To study the prevalence of various cardiovascular diseases on Echocardiographic evaluation in pediatric age group from Bhopal region, in central India, from 1st January 2003 to November 2007- A Retrospective analysis.

Methods: 1085 pediatric patients who have undergone two dimensional, M- mode and colour Doppler Echocardiography in the Department of Cardiology were studied to ascertain the incidence and prevalence of congenital and acquired heart diseases in the pediatric age group. All echocardiograms were recorded as per recommended guidelines.

Results: There were 527 (48.57%) cases of congenital heart disease; 179 (16.49%) cases of valvular heart diseases; 20 (1.84%) cases of pericardial diseases and 52 (4.79%) cases of other less common disease combinations with multiple etiologies.

Conclusion: Echocardiography is useful in detection of congenital and acquired heart disease in the pediatric age group. The possible factors would be genetic predisposition, consanguinity, ignorance towards consumption of fetotoxic medicines, rubella infection, tuberculosis, rheumatic fever, etc. Thus, more awareness towards such statistically significant data is indicated for health programmes, especially in relation to improvement of infant mortality and morbidity rate, not only in rural, but also in the urban population of developing countries.

KEYWORDS

echocardiography, congenital, pediatric

Introduction

Congenital cardiovascular disease is defined as an abnormality in cardio circulatory structure or function that is present at birth. Congenital heart disease occurs in 8 per 1000 live births and comprises one of the major diseases in the paediatric age group. CHD has become an important cause of morbidity and mortality in infancy and accounts for two-thirds of all major birth defects along with neural tube defects.²

The aim of the study is to discern the spectrum of cardiovascular abnormalities in children up to 12 years of age on echocardiographic examination.

Materials and Methods

This study comprised of retrospective analysis of echocardiography performed on pediatric patients in the Department of Cardiology, Gandhi Medical College, Bhopal, from 1st January 2003 to November 2007.

Inclusion Criteria: Patients of paediatric age group (upto 12 years) who underwent Echocardiography in the Department of Cardiology, Gandhi Medical College, Bhopal.

Patients were subjected to two dimensional (2D), M. mode Doppler echocardiography. All echocardiograms were recorded in supine and left lateral position taking all five standard views i.e., parasternal long axis view, parasternal short axis view, apical four chamber view and apical long axis and two chamber views, and additional views where necessary.

1. Sub-Xiphoid (Subcostal) view.
2. Apical views.
3. Left parasternal views.
4. Suprasternal notch views.
5. Right parasternal views.

Results

The present study was undertaken in the Department of Cardiology, Gandhi Medical College, Bhopal, to study the prevalence of various cardiovascular diseases in pediatric age group by 2-D, M-mode and color Doppler echocardiography with main emphasis on congenital heart diseases.

One thousand and eighty five cases of pediatric age group (0-12 yrs) who had undergone echocardiography were studied retrospectively to find out the distribution of various cardiovascular diseases.

There were 527 (48.57%) cases of congenital heart disease; 179 (16.49%) cases of valvular heart diseases; 20 (1.84%) cases of pericardial diseases and 52 (4.79%) cases of other less common disease combinations with multiple etiologies. 298 patients (27.46%) undergoing echocardiography had normal echocardiographic findings of which 175 were males (58.72%) and 123 were females (41.27%).

Out of 527 cases of CHD 299 (56.73%) cases were male and 228 (43.26%) cases were female. Thus, the male to female was 1.30 : 1. Maximum number of cases analyzed were below 1 year 233 (44.21%); 1-5 years 102 cases (19.35%); 5-10 years 118 cases (22.39%) and 10-12 years 74 cases (14.04%).

Table 1: Distribution of Congenital Heart Disease

S. No.		N (%)	Males (%)	Females (%)
1	VSD	236(44.78)	134(56.77)	102(43.22)
2	ASD	75(14.23)	33(44)	42(56)
3	PDA	58(11)	32(55.17)	26(44.82)
4	TOF	38(7.21)	25(65.78)	13(34.21)
5	PS	22(4.17)	13(59.09)	9(40.9)
6	TGA	21(3.98)	16(76.19)	7(23.8)

Amongst the congenital heart disease 236 (44.78%) were of VSD. This was the most common congenital heart disease in the study. 134 (56.77%) cases were male and 102 (43.22%) cases were of females. Most common type of VSD was perimembranous i.e. 195 (82.62%) of cases. 110 (46.61%) of cases of VSD were in 0-1 years age group. 76 (32.20%) case in 1-5 years 34 (14.40%) cases in 5-10 years and 16 (6.77%) cases in 10-12 years age group.

Second most common CHD was ASD with 75 (14.23%) cases. Most common type of ASD was ostium secundum type i.e. 68 (90.66%) of cases.

58 (11%) cases of PDA; 38 (7.21%) cases of TOF; 21 (3.98%) cases of TGA; 22 (4.17%) of cases of valvular PS; 20 (3.79%) cases of PFO; 11 (2.08%) cases of bicuspid AV and AS. 20 cases observed were of PFO

which were mostly in 0-1 year age group 12 (60%); 12 (60%); 1-5 year 2 (10%) 5-10 year 3 (15%) and 10-12 years 3 (15%).

8 cases (1.51%) were of tricuspid atresia, 22 (4.17%) case of valvular pulmonary stenosis; 5 (0.96%) cases of coarctation of aorta were observed.

In valvular heart disease, total of 179 (16.49%) cases were observed. MR was the most common lesion comprising 36 (20.11%) cases. There were 22 (12.29%) cases of MR with TR; 21 (11.73%) cases of MR with AR; 18 (10.05%) cases of MR with TR; 6 (.35%) cases of MR with AR with TR with PR; 2 (2 (1.11%) case of MR with TR with PR. 17 (9.49%) cases were of TR; 2 cases each of TR with AR and TR with PR. There was 1 case of isolated PR.

There were 2 cases of congenital MS; 10 (5.5%) cases of MS with MR with AR with TR; 3 (1.67%) cases of MS with AR with TR; 12 (6.70%) cases of MS with MR with TR; 5 (2.79%) cases of MS with TR; 2 (1.11%) cases of MS with AR; 6 (3.35%) cases of MS with MR.

There were 20 cases of pericardial disease of which 15 cases were pericardial effusion and 5 cases constrictive pericarditis.

Other developmental anomalies which were recorded were right pulmonary artery branch stenosis; Pentalogy of Fallot; Hypertrophic cardiomyopathy non obstructive; anomalous PV connections; hypoplastic left heart; asymmetrical septal hypertrophy; single ventricle.

Discussion

Echocardiographic studies have emerged as an integral part for evaluation of patients with cardiovascular diseases. It helps to identify the lesion - its extent, severity and medical vs. surgical interventions and treatment. The optimum timing of surgery and follow up of surgical results can be assessed accurately.

There was male preponderance in this study (56.73%), which was similar as in study by Chadha et. Al3, Bidwai et. Al4, and Jain et. Al5. The most common CHD in this study was VSD (44.78%), which is in accordance with studies by Sharma et al6 (53%), Kasturi et al1 (27%), Bidwai et al.4 (24%), Jain et al5 (45.4%) and Vashistha et al7 (11.4%). ASD (14.23%) was second most common CHD in the present study of which 44% were male and 56% were females. In study by Thakur et al.8 (1995) 38% cases had ASD which was the most common CHD in his study. However the differences may be due to lack of awareness among people in this region and lack of facilities for early diagnosis like fetal echocardiography.

There were 58 cases (11%) of PDA which was third most common CHD in the study. There were 32 males (55.17%) and 26 females (44.82%). In study by Kasturi et al.1 6%, Bidwai et al.4 10.3% and Vashistha et al.7 2.4% PDA was third most common CHD. However in a study by Jain et al.5 it was second most common 5.4% after VSD.

There were 38 cases of TOF (7.21%) of which 25 cases (65.78%) were male and 13 cases (34.21%) were female. In a study by Sharma et al6, TOF was second most common CHD (32%) after VSD (53%).

Of all cyanotic CHD, TOF (7.21%) was most common in this study as also in study done by Vashistha VM et al.7 (13.6%), Bidwai et al.4 (25.4%) and Kasturi et al.1 (9%). In this study there were an increased number of males with TOF, which concurs with the findings of Bidwai et al.4 while Vashistha et al.7 found an equal sex distribution and Chadha et al.3 found a higher number of females. The gender difference could be due to the fact that in this study cases were echocardiographically proven.

In the present study there were 21 cases of TGA of which 16 cases (76.19%) were male and 5 cases (23.8%) were females. It comprises about 4.04% of all CHD. In a study by Kasturi et al.1, Jain et al.5 and Vashistha et al.7 it was 3%; 1.8% and 2.3% respectively.

There were 11 cases of AS mostly in 0-5 age group (63.3%). There were 8 cases of AR mostly in males 7 (87.5%) then females 1 (12.5%). 5 cases of coarctation of aorta were recorded of which 3 were females

and 2 males.

The relative frequency of occurrence of specific cardiovascular malformation from both clinical and observational studies shows the occurrence of cardiac malformation at birth as VSD 30.5%, ASD 9.8%, PDA 9.7%, PS 6.9%, CoA 6.8%, AS 6.1%, TOF 5.8%, Complete transposition of great arteries 4.2%, Persistent ductus arteriosus 2.2%, Tricuspid atresia 1.3% and other 16.5%.

There were 188 (17.32%) cases of valvular heart disease of which 2 cases were of Congenital MS, 39 (21.78%) cases of MR, 26 (14.52%) cases of MR with TR, 21 (11.73%) cases of MR with AR, 20 (11.17%) cases of MR with AR with TR, 18 (10.55%) cases of TR, 12 (6.70%) cases of MS with TR, 10 (5.58%) cases of MS with MR with AR with TR and 6 (3.35%) cases of MS with MR.

The possible factors for such a prevalence, which is at par with similar studies conducted in country, could be due to consanguinity among parents, ignorance towards the consumption of fetotoxic medicines, rubella infection or even genetic predisposition etc. Such statistical survey based on echocardiography indicates lack of health awareness among the existing population. Also, the role of fetal echocardiogram during the second trimester (18-20 weeks) would be a useful diagnostic tool to detect not only the prevalence of CHD but also the correctable versus non-correctable congenital heart diseases after birth.

Thus, more awareness towards such statistically significant data is indicated as apart of awareness towards health programme especially in relation to improvement of infant mortality and morbidity rate not only in the rural but also in urban population of our country.

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