

SPECTRUM OF HEART DISEASES IN KASHMIR; 10 YEARS RETROSPECTIVE /PROSPECTIVE ECHOCARDIOGRAPHIC STUDY DATA

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Contribution

MMM conceived the idea and planned study. ABR,UTM helped in collection and assembly and interpretation of the data. AAR drafted the article. TAM, GA did critical revision of the article for important intellectual content. SAB, FAM, AI did statistical analysis. All authors contributed significantly to the submitted manuscript.

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ABSTRACT

Objectives: This study was conducted to provide demographic and echocardiographic based spectrum of heart diseases

Methodology: This echocardiographic based cross sectional study was conducted at Department of Medicine Government Medical College Srinagar. Data was collected for a period of 10 years retrospectively and prospectively from 1st December 2005 to 31st January 2012, excluding paediatric patients and patients undergoing repeat procedure.

Results: In our study total of 11000 patients were included with mean age of all subjects was 50.6 ± 19.6 years. Of all the subjects 6664 (56%) were males with mean age of 51.9 ± 19.2 years. Hypertensive heart disease, valvular heart disease and cardiomyopathies accounted for 78% of heart diseases. Common indications for echocardiography in the subjects studied were hypertension (49.12%), valvular heart diseases [1715 (14.75%)], cardiomyopathies (8.67%) and ischemic heart disease (8.19%).

Conclusion: The results of present study revealed that hypertensive heart disease was the most common echocardiographic finding especially in males while valvular heart diseases and cardiomyopathies were seen more in females. So echocardiography can be considered as good diagnostic tool for gender and age related cardiac diseases.

Key Words: Heart disease; echocardiography; spectrum, hypertension

INTRODUCTION

Heart diseases are on the increase worldwide especially in developing economies.¹ Cardiovascular diseases have become ubiquitous cause of morbidity and a leading contributor to mortality in most countries.^{2,3} The developing countries contribute a greater share to the global burden of cardiovascular diseases than the developed countries.^{1,2} Although present high burden of cardiovascular diseases deaths is in itself an adequate reason for attention, a greater cause of concern is the earlier age of cardiovascular diseases deaths in developing countries compared with developed countries.

The rise and decline of an epidemic in developed countries have been well documented.^{1,4} The identification of major risk factors through population based studies and effective control strategies have contributed to fall in cardiovascular diseases mortality rates as observed in almost all industrialized countries.² The potential of echocardiography as a research tool in developing countries cannot be overemphasized. Studies emanating from several developing countries have focused on the common cardiovascular diseases prevalent such as hypertensive heart disease, cardiomyopathies, valvular heart diseases, ischemic heart disease and others.

The world of echocardiography has witnessed a phenomenal growth, from the first attempt in echocardiography by Elder and Hertz, in Lund in Sweden in 1954 to three-dimensional echocardiography in current practice. Echocardiography is now a particularly attractive and established technique for evaluation and accurate diagnosis of various forms of heart diseases. It gives validated, simple, reliable, serial and non-invasive assessment of the heart. Findings from M-mode, two dimensional (2D) and Doppler echocardiography correlate well with those of cardiac catheterization and radionuclide studies and offer prognostic options and may influence management and longitudinal follow up of patients.⁵⁻⁹ Echocardiographic examination can be performed as a safe procedure, with insignificant adverse effects, in a relatively short period of 15 to 30 minutes. Echocardiography allows a non-invasive estimate of almost all important hemodynamic parameters.^{10,11}

This study was conducted to provide spectrum of heart diseases based on echocardiography and their demographic distribution..

METHODOLOGY

This cross sectional retrospective study was conducted at echocardiographic section of Department of Medicine Government Medical College Srinagar, Jammu and Kashmir. This study included data of all the subjects who had undergone echocardiography for various heart diseases for a period of 10 years and 5 months, from 1st December 2005 to 31st January 2012 except paediatric patients and subjects undergoing repeat procedure whose diagnosis was already present in our data.

Patients undergone M-mode, two dimensional (2D), colour mode, transesophageal and Doppler measurements according to standard echocardiographic procedures. Echocardiographic diagnoses were divided in eight major groups including hypertensive heart disease, valvular heart diseases, cardiomyopathies, ischemic heart disease/coronary artery disease, cor-pulmonale, adult congenital heart diseases, pericardial diseases, cardiac tumors.

Total data collected was analyzed for age, gender, indication for echocardiography and echocardiographic diagnosis. Continuous variables were expressed as mean \pm standard deviation and categorical variables were expressed as percentages. Differences in categorical variables were assessed by chi-square analysis. P-value of less than 0.05 was taken as significant.

RESULTS

In our study total of 11900 echocardiograms were analysed. Out of them 900 were normal and were excluded from study. The mean age of all subjects was 50.6 ± 19.6 years with range of 15-90 years. Of all the subjects 6664 (56%) were males with mean age of 51.9 ± 19.2 years. Distributions of persons in different age groups were 7.9% in (15-20 years), 20.9% in (21-40 years), 43.0% in (41-60 years), 19.4% in (61-80, years) and 8.80% in (81-90 years) respectively. The sex ratio of studied subjects was 1.27 ($p < 0.05$) as shown

Table 1: Age and Gender Distribution of Study Population (n=11000)

Age (Years)	Male n(%)	Female n(%)	Total n(%)	P value
15-20	447 (3.8%)	493 (4.2%)	940 (8%)	0.000
21-40	1235 (10.3%)	1255 (10.5%)	2490 (21%)	
41-60	2993 (25.1%)	2125 (17.9%)	5118 (43%)	
61-80	1353 (11.4%)	955 (8.0%)	2308 (19%)	
81 onwards	636 (5.4%)	408 (3.4%)	1044 (9%)	
Total	6664 (56.0%)	5236 (44%)	11900 (100%)	
Mean \pm SD	51.9 \pm 19.2	48.9 \pm 19.9	50.6 \pm 19.6	

in table 1

The frequencies of various clinical indication of echocardiography are shown in table 2. The common indications for echocardiography in the subjects studied were; hypertension [4941 (49.12%)], valvular heart diseases [1715 (14.75%)], cardiomyopathies [1302 (8.67%)] and ischemic heart disease [975 (8.19%)],

chronic obstructive pulmonary diseases [568 (4.77%)], interstitial lung disease [293 (2.46%)], congenital heart disease [278 (2.33%)], congestive cardiac failure [256 (2.15%)], chest pain [243 (2.04%)], dyspnea [227 (1.90%)], angina on exertion [205 (1.72%)], palpitations [193 (1.62%)], cardiac murmurs [173 (1.45%)], abnormal electrocardiogram [161 (1.35%)], cardiomegaly on chest X-ray [147 (1.23%)], peripartum [142 (1.19%)] and

Table 2: Indications for Echocardiography in Study Population (n=11000)

S No	Indication	Frequency (n)	Percentage (%)
1	Hypertension	4941	41.52
2	Valvular heart disease	1757	14.76
3	Cardiomyopathy	1032	8.67
4	Ischemic heart disease	975	8.19
5	Chronic obstructive pulmonary disease	568	4.77
6	Interstitial lung disease	293	2.46
7	Congenital heart disease	278	2.33
8	Congestive cardiac failure	256	2.15
9	Chest pain	243	2.04
10	Dyspnea	227	1.9
11	Angina	205	1.72
12	Palpitation	193	1.62
13	Cardiac murmur	173	1.45
14	Abnormal electrocardiogram	161	1.35
15	Cardiomegaly on chest X ray	147	1.23
16	Peripartum	142	1.19
17	Routine check up	309	2.59

routine [309 (2.59%)].

Out of total abnormal echocardiograms hypertensive heart disease was found in 4796 (43.60%), valvular heart diseases in 2266 (20.60%), cardiomyopathies in 1518 (13.80%), ischemic heart disease in 1155 (10.50%), cor-pulmonale in 781 (7.10%), adult congenital heart diseases in 319 (2.90%), pericardial diseases in 154 (1.40%) and cardiac tumors in 11(0.10%) subjects. The frequency of

different diseases with regard to sex is shown in table 3 . P value was significant for sex distribution across spectrum of heart diseases in the study (p=0.009).

Mean age of patients in different groups were: hypertensive heart disease 60.5 ± 15.6 years, valvular heart diseases 32.5 ± 15.1 years, cardiomyopathies 51.2 ± 15.3 years, ischemic heart diseases 59.5 ± 15.0 years, cor-pulmonale 57.1 ± 16.3 years, congenital heart diseases 28.3 ± 11.4

Table 3: Spectrum of Heart Diseases in Study Population (n=11000)

Diagnosis	Total	Males n=6664	Females n=5236	P value
Hypertensive heart disease	4796	2973	1823	0.009
Valvular heart disease	2266	952	1314	
Cardiomyopathies	1518	714	804	
Ischaemic heart disease	1155	669	486	
Cor -pulmonale	781	538	243	
Congenital heart disease	319	105	214	
Pericardial disease	154	56	98	
Cardiac tumours	11	7	4	
Total	11000	6014	4986	

Table 4: Spectrum of Heart Disease Across Age in Study Population (n=11000)

Diagnosis	Age (years)	P value
	Mean \pm SD	
Hypertensive heart disease	60.6 \pm 15.6	0.000
Valvular heart disease	32.5 \pm 15.1	
Cardiomyopathies	51.2 \pm 15.3	
Ischaemic heart disease	59.5 \pm 15.0	
Cor -pulmonale	57.1 \pm 16.3	
Congenital heart disease	28.3 \pm 11.4	
Pericardial disease	44.2 \pm 13.4	
Cardiac tumours	33.6 \pm 11.7	

years, pericardial diseases 44.2 ± 13.4 years and cardiac tumors 33.6 ± 11.7 years, as shown in table 4.

DISCUSSION

The potential of echocardiography as a research tool in developing countries cannot be overemphasized. Worldwide there are studies that have provided spectrum of heart diseases based on echocardiography in their respective community. In our state of Jammu and Kashmir no such study had been conducted so far. It was deemed relevant and necessary to conduct the study to know the spectrum of heart diseases in our area.

The common indications for echocardiography in the subjects studied were; hypertension, valvular heart diseases, cardiomyopathies and ischemic heart disease. This is more or less consistent with observations of Okechukwa S Ozal et al in which more than 60% referrals were because of hypertension or hypertensive heart disease and Aje A et al in which commonest indication of echocardiography was hypertension (47.1%).^{13,14}

On comparing present study with previous studies there is heterogeneity in spectrum of heart diseases. However this is consistent with the fact that there is considerable heterogeneity among previous studies as well as shown in table 5 and 6. In present study hypertensive heart disease was present in 43.60% subjects and was commonest echocardiographic diagnosis in our centre. This is more or less consistent with reports from similar studies by Sani MV et al who found hypertensive heart disease as commonest echocardiographic diagnosis present in 46.6% of subjects,

Agomuoh D I et al who found hypertensive heart disease in 57.83% and Balogun et al who found hypertensive heart disease as commonest echocardiographic diagnosis present in 60.91% of subjects.^{9,16,17} On contrary in similar studies by Ukoh VA et al who found hypertensive heart diseases in 30.70% subjects and Okechukwa S Ozal et al who found hypertensive heart disease present in 81.95% subjects. This difference is attributed to difference in ethnicity and number of subjects under study.^{13,18}

In present study valvular heart diseases were found in 20.60% subjects. This is more or less consistent with studies of A B G Amoah in which valvular heart diseases were present in 17.40% subjects and Ukoh V A et al in similar study found valvular heart diseases in 18.74% subjects.^{18,20} On contrary Ike S O in a study found valvular heart disease in 38.54% subjects and P M Kolo et al in their study found valvular heart disease in 8.43% subjects.^{10,15} This difference is attributed to difference in ethnicity and number of subjects under study.

In present study cardiomyopathies were found in 13.80% subjects. This is more or less consistent with studies of Ike S O in which cardiomyopathies were found in 10.52% subjects and Okechukwa S Ozal et al who found cardiomyopathies in present in 9.79% subjects.^{10,13} Adesanyo CO et al in their study found cardiomyopathies in 6.79% subjects and Sani M V et al in their study found cardiomyopathies in 29.14% subjects.^{16,19} This difference is attributed to difference in ethnicity and number of subjects under study.

In present study ischemic heart disease was found in 10.50%. This is similar to study of A B G Amoah et al in

which ischemic heart disease was found in 11.30%.²⁰ However study of Ukoh VA et al found ischemic heart disease in 2.71% subjects and Balogun M O et al found ischemic heart diseases in 2.29% subjects.^{9,18} This difference may be due to difference in ethnicity and number of subjects under study. Also it is routine practice in our centre to perform echocardiography in patients having old or new myocardial infarction.

In present study cor-pulmonale was found in 7.10%. Similar results were found in study of Okechukwa S Ozal et al in which corpulmonale was found in 5.79% subjects.¹¹ Ukoh VA et al found cor-pulmonale in 12.1% subjects and Agomuoh DI et al found cor-pulmonale in 1.20% subjects.^{39,40}

Adult congenital heart diseases were found 2.90%. This is more or less consistent with study of Agomuoh D et al in which congenital heart disease was found in 2.40% subjects, Adesanya CO et al (2.42%) subjects and Okechukwa S Ozal et al (1.33%).^{13,34,40} While PM Kolo et al in their study found adult congenital heart diseases in 8.82% subjects.¹⁵ This difference is attributed to difference in

ethnicity and number of subjects under study.

Pericardial diseases were found in 1.40% same as Sani M V et al (1.41%) subjects and Ukoh V A et al (1.47%) subjects.^{16,18} Okechukwa S Ozal et al in their study found pericardial diseases in 5.79% subjects.¹³ In present study cardiac tumors were found in 0.01% subjects in our study. Okechukwa S Ozal et al found cardiac tumors in 0.01% subjects.¹³

In most of the studies valvular heart diseases were frequent in females mostly rheumatic in origin. The study done by Okechukwa S Ozal et al had shown more or less similar results.¹³ This also goes with the results of study done by Juan J. Gomez-Doblas.²¹ Moreover Okechukwa S Ozal et al in their study found hypertensive heart disease constituting 81% of diagnosis more frequent in males.¹³ They also found pericardial diseases, ischemic heart diseases more frequent in males than females while congenital heart diseases is more frequent in females than males. Comparison with different studies is shown in table 5 and 6. This differential distribution of heart diseases across sex with significant p-value (0.009) was found in our study. However further

Table 5: Comparison With Previous Studies

Year	2009	2009	2008	2007
Study	kolo et al ¹⁵	Aje et al ¹⁴	Okechukwu et al ¹³	Sani et al ¹⁶
Subjects	P.M. Kolo et al 759	880	449	494
HHD	70.75%	78.06%	81.95%	46.60%
VHD	8.43%	6.13%	11.80%	12.95%
CM	8.30%	4.54%	9.79%	29.14%
PD	2.50%	2.50%	5.79%	1.41%
CP	0	1.70%	5.79%	1.41%
IHD	1.18%	2.04%	2.0%	4.65%
ACHD	8.82%	1.13%	1.33%	1.21%
CT	0	0	0.10%	0

HHD = Hypertensive Heart Disease, VHD = Valvular Heart Disease, CM = Cardiomyopathy, PD = Pericardial Diseases, CP = Cor-pulmonale, IHD = Ischemic Heart

Disease, ACHD = Adult Congenital Heart Disease, CT = Cardiac tumors.

Table 6: Comparison with Previous Studies

Year	2006	2005	2005	1999	1979
Study	Agomuoh et al ¹⁷	Ike et al ¹⁰	Ukoh et al ¹⁸	Balogun et al ⁹	Adesanya et al ¹⁹
Subjects	83	2252	811	87	206
HHD	57.83%	19.36%	30.70%	60.91%	11.65%
VHD	15.66%	38.54%	18.74%	8.04%	6.79%
CM	33.73%	10.52%	20.34%	24.13%	6.79%
PD	7.22%	10.12%	1.47%	4.59%	9.70%
CP	1.20%	1.37%	1.47%	0	5.82%
IHD	0	0.88%	2.71%	2.29%	4.36%
CHD	2.40%	14.83%	6.41%	0	2.42%
CT	0	0	0	0	0

No. = number, HHD = Hypertensive Heart Disease, VIM = Valvular Heart Disease, CM = Cardiomyopathy, PD = Pericardial Diseases, CP = Cor-pulmonale, IHD = Ischemic

Heart Disease, CHD = Adult Congenital Heart Disease, CT = Cardiac tumors.

studies are needed to determine sex distribution of heart diseases as data published on this aspect is sparse.

CONCLUSION

The results of present study revealed that hypertensive heart disease was the most common echocardiographic finding followed by valvular heart diseases and cardiomyopathies. Hypertensive heart disease, ischemic heart disease, were seen more in males. Valvular heart diseases, cardiomyopathies and congenital heart diseases were seen more in females. So echo should be considered for proper diagnosis of different heart diseases with respect to gender and age.

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