

ECHOCARDIOGRAPHIC SPECTRUM OF HEART DISEASE IN A SECONDARY MISSIONARY HEALTHCARE FACILITY IN ONITSHA SOUTH EAST NIGERIA.

¹Nwaneli CU, ¹Ezejiolor OI, ²Omejua EG, ¹Onwubuya EI

¹Department Of Internal Medicine Nnamdi Azikiwe University Teaching Hospital Nnewi Nigeria

²Department Of Internal Medicine Federal Medical Centre Owerri, Nigeria

ABSTRACT

BACKGROUND: Cardiovascular disease (CVD) is the leading cause of death world wide with 80% of these deaths occurring in low and middle income countries. Echocardiography has become the most common and cost effective cardiac imaging modality available in the diagnosis of heart disease. The non-invasive nature of echocardiography has made it the preferred imaging modality in the evaluation of cardiac structure and function. In Nigeria echocardiography is widely available in tertiary hospitals which are predominantly government funded. Echocardiography is increasingly becoming available in secondary health facilities and private health facilities. There is dearth of data on echocardiographic pattern of heart disease in Anambra state.

AIM: The aim of this study was to identify the spectrum of heart disease on echocardiography in a large mission hospital in the commercial city of Onitsha in Anambra state.

MATERIALS AND METHODS: A 3- year retrospective audit of 725 echocardiogram reports at a specialist mission hospital in the commercial city of Onitsha, South East Nigeria from January 2014 to December 2016 was carried out. Data was analyzed for demographics, indication for echocardiography and diagnosis.

RESULT: There were 364 males (50.2%) and 361 (49.8%) females. The age range of the subjects was 6 months to 100 years. The mean age was 54.6 ± 17.4 . Hypertensive heart disease (HHD) (42.9%) was the most common indication for echocardiography followed by heart failure (21.6%). HHD (58%) was the most common heart disease followed by dilated cardiomyopathy (7.4%) and valvular heart disease (6.1%). 61 (8.1%) subjects had normal echocardiogram.

CONCLUSION: Hypertensive heart disease is the most common indication for echocardiography and also the predominant cause of heart disease in Onitsha, South East Nigeria followed by dilated cardiomyopathy and valvular heart disease.

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INTRODUCTION

Cardiovascular disease (CVD) is the leading cause of death worldwide with 80% of these deaths occurring in low and middle income countries^{1,2}. Echocardiography has become the most common and cost effective cardiac imaging modality available in the diagnosis of heart disease^{3,5}. The non-invasive nature of echocardiography has made it the preferred imaging modality in the evaluation of cardiac structure and function⁶. Echocardiography is recommended in diagnosis of valvular and congenital heart diseases, evaluation of systolic and diastolic function of the left ventricle in patients diagnosed with heart failure and diagnosis of pericardial effusion.⁷ It is also required in the evaluation of hypertensive heart disease, myocardial infarction, and diagnosis of

infective endocarditis as well as cardiomyopathies.⁷ In Nigeria echocardiography is widely available in tertiary hospitals which are predominantly government funded. Echocardiography is increasingly becoming available in secondary health facilities and private health facilities. There is dearth of data on echocardiographic pattern of heart disease in Anambra state. The aim of this study was to identify the spectrum of heart disease on echocardiography in a large missionary hospital in the commercial city of Onitsha in Anambra state.

METHODS

This was a 3 - year retrospective audit of 725 transthoracic echocardiographic reports done at St Charles Borromeo Multi Specialist Hospital Onitsha, Nigeria. The hospital is one of the largest secondary health care facilities in Anambra State, South East Nigeria. It is run by the Roman catholic mission and serves the metropolitan city of Onitsha and neighboring cities

Corresponding Author: Dr. Uchenna Nwanell,
Department of Internal Medicine,
Nnamdi Azikiwe University Teaching Hospital, Nnewi
Nigeria

including Nnewi and Asaba. Specialist services are available in the four major areas of Internal Medicine, Surgery, Paediatrics and Obstetrics and Gynaecology. Cardiology services is provided by a visiting cardiologist who routinely carries out echocardiography on patients referred from both within the hospital and from other healthcare facilities. Echocardiography report of each patient is routinely entered into a register.

Trans-thoracic echocardiogram reports done between Jan 1 2014 and Dec 31 2016 were reviewed. A total of 755 echocardiograms were done during this period. Thirty reports in which either the indication and/or diagnosis were missing were excluded. All echocardiographic studies were done and reported by a cardiologist. Echocardiography was done with a HP SONOS 5500 machine equipped with two dimensional(2D), M mode, Pulse wave, Continuous Wave, Colour and Tissue Doppler Imaging modalities. Standard parasternal, apical, subcostal and suprasternal views were used to image the heart. Measurements were taken according to the recommendations of the American Society of Echocardiography in conjunction with European Association of Echocardiography⁷. The age, sex, indication for study and echocardiographic diagnosis of the subjects were extracted from the reports in the register.

Data was entered into SPSS Version 20. Continuous variables were presented as mean \pm standard deviation. Univariate data analysis was performed for age, sex, indication and echocardiographic diagnosis

RESULTS.

There were 364 males (50.2%) and 361(49.8%) females. The age range of the subjects was 6months to 100 years. The mean age was 54.6 \pm 17.4. The Age and sex distribution of the subjects is displayed in Table 1.All the indications for echocardiography are shown in Table 2. Hypertensive heart disease(HHD) (42.9%) was the most common indication for echocardiography followed by heart failure (21.6%). Other indications in decreasing order of frequencies were unexplained shortness of breath on exertion (5.9%), cardiomegaly on chest X-ray (4.4%), Diabetes mellitus (3.9%), Chest Pain (2.7%), palpitations (2.4%), valvular heart disease (2.4%), arrhythmias (1.9%), dilated cardiomyopathy (1.8%), electrocardiographic evidence of ventricular hypertrophy(1.5%),syncope(1.2%), unexplained persistent bilateral leg swelling 0.9%, human immunodeficiency virus (HIV) associated heart disease(0.9%), ischaemic heart disease (0.9%).

664(91.6%) subjects had abnormal echocardiogram while 61(8.4%) had normal echocardiogram HHD (58%) was the most common heart disease diagnosed

followed by dilated cardiomyopathy(7.4%) and valvular heart disease. Other diagnosis made on echocardiography are shown in Table 3. Degenerative mitral valve disease was the most common cause of valvular heart disease followed by rheumatic heart disease. The most common abnormalities found on echocardiogram were left ventricular diastolic dysfunction, left ventricular hypertrophy and atrial enlargement predominantly due to hypertensive heart disease. 3 cases of hypertrophic cardiomyopathy were seen. All has interventricular septum diameter above 25mm with ratio of the septal wall to posterior wall thickness more than 2. Ischemic heart disease was not diagnosed in our study.

Table 1. Age/Sex distribution of the Subjects

Age range	Male	Female	Total
0-9	2	2	4
10-19	8	2	10
20-29	17	16	33
30-39	32	26	58
40-49	47	54	101
50-59	55	62	117
60-69	65	56	121
70-70	47	41	88
80-89	17	8	25
90-99	3	1	4
100-110	0	1	1
Missing	71	92	163
Total	364	361	725

Table 2

INDICATION	FREQUENCY(n)	PERCENT
Hypertensive Heart Disease	421	42.4
Heart failure	236	23.8
Shortness of Breath of unknown cause	57	5.7
Cardiomegaly found on Chest X ray	42	4.2
Diabetes Mellitus	38	3.9
Chest pain	26	2.6
Palpitations	24	2.4
Valvular Heart Disease	24	2.4
Arrhythmias	18	1.9
Dilated Cardiomyopathy	17	1.8
ECG suggestive of Cardiac hypertrophy	15	1.5
Syncope	12	1.2

Leg swelling	12	1.2
HIV Cardiomyopathy	9	0.9
Ischemic Heart Disease	9	0.9
Stroke	7	0.7
Congenital Heart Disease	5	0.5
Cardiorenal Syndrome	5	0.5
Chemotherapy Work up	4	0.4
Family History of Sudden Death	4	0.4
CorPulmonale	3	0.3
Pulmonary Embolism	3	0.3
Peripartal Dilated Cardiomyopathy	1	0.1
Total	992	100

Table 3
Echocardiographic Diagnosis

Diagnosis	Number	Percent
Hypertensive heart Disease	413	57
Normal echocardiogram	61	8.4
Dilated Cardiomyopathy	54	7.4
Valvular heart disease	52	7.2
Corpulmonale	38	5.2
Diabetic Heart Disease	37	5.1
Congenital Heart Disease	6	0.8
Hypertrophic Cardiomyopathy	3	0.4
Chronic Pericarditis	2	0.3
Other echocardiographic abnormalities	59	8.3
Total	725	100

DISCUSSION

Hypertensive heart disease (HHD) (42.9%) was the most common indication for echocardiography in our study. This is consistent with reports from other parts of Nigeria⁸⁻¹². Heart failure (23.8%) was next most common indication. Uwanurochi et al,¹⁰ Ejim et al¹¹ and Talle et al¹³ have also reported HHD and heart failure as two most common indications for echocardiography. This is however different from some reports from northern parts of Nigeria where peripartal cardiomyopathy was the second most common indication after hypertensive heart disease⁹. Peripartal cardiomyopathy is reported to be a common cause of heart failure in women in northern Nigeria^{14,15}. The disease has been linked to traditional practices by women in some parts of northern Nigeria after delivery. Other indications for echocardiography in our study including unexplained shortness of breath,

cardiomegaly on chest X ray, diabetes mellitus and valvular heart disease, palpitations, chest pain, arrhythmias were also reported by other authors however they individually constitute a small fraction of the indications for echocardiography.

Hypertensive heart disease (57%) was the most prevalent echocardiographic diagnosis in our study. Our finding is consistent with reports from different regions of Nigeria where hypertensive heart disease have been found to be the most common cause of heart disease on echocardiography.¹⁶⁻²⁴ The high prevalence of HHD found in our study compares with findings reported by other researchers. Ogah et al¹⁸ reported hypertensive heart disease in 56.7% of 2010 echocardiograms at a private center in Abeokuta while Adebayo et al¹⁸ reported hypertensive heart disease in 59.4% in a prospective echocardiographic study of 2501 subjects referred for echocardiography in Ile Ife over an eight year period. Hypertensive heart disease was reported in 58.8% of nine hundred and thirteen echocardiograms by Kolo et al²³ in Ilorin South west Nigeria. Our findings is in contrast with report by Ike SO²⁵ and Ejim et al¹⁰ in Enugu in South East who both found that valvular disease is the predominant cause of heart disease on echocardiography. This variation with studies from other parts of the country has been attributed to the fact that Enugu has been a major center for heart surgeries in Nigeria for more than three decades and receives referrals from all parts of the country for open heart surgeries for correction of valvular and congenital heart diseases. The high prevalence of hypertensive heart disease in our study and other studies in different parts of Nigeria parallels the high prevalence of hypertension in Nigeria. Hypertension has been reported to be the most prevalent cardiovascular risk factor in Nigeria and sub-saharan Africa.^{26,27} Hypertensive heart disease is also the most common aetiology of heart failure in Nigeria and Sub-Saharan Africa.^{28,29}

Dilated cardiomyopathy (8.4%) and valvular heart disease (8.2%), were the second and third most common cause heart disease respectively. This is similar to reports from many centers in Nigeria.^{20,23,24} Idiopathic cardiomyopathy was the predominant cardiomyopathy followed by hypertrophic cardiomyopathy. We did not find any case of peripartal cardiomyopathy. This was at variance with studies from the Northern part of Nigeria where peripartal cardiomyopathy has been reported to be very common and constitutes the major cause of heart disease after hypertension.^{9,13} We found that degenerative disease of the mitral and aortic valves were more common than rheumatic heart disease. This is consistent with reports by Ejim et al¹⁰ in Enugu who found that degenerative

valvular heart disease is the predominant cause of valve disease followed by rheumatic heart disease. This may indicate that the incidence of rheumatic heart disease is on the downward trend. This may be associated with widespread use of antibiotics by many Nigerians for common ailment. Antibiotics are procured as over the counter medications without prescription at patent medicine stores which are ubiquitous in the country. In contrast several reports from other parts of Nigeria show that rheumatic heart disease is second most common heart disease and also the major cause of valvular heart disease.^{12,30} There was no case of ischemic heart disease in our study. This finding is consistent with reports by Agomuohe et al²² and Ekpe et al³⁰ who also reported no case of ischemic heart disease among patients referred for echocardiographic in their centers. Most studies done in Nigeria report a low but rising incidence of coronary artery disease.^{31,32} All the cases referred for echocardiography with indication of ischemic heart disease did not show regional wall motion abnormality. These subjects predominantly had chest pain without electrocardiographic and biochemical markers of acute coronary syndromes. The fact that echocardiography is not the preferred diagnostic tool for diagnosis of ischemic heart disease will contribute to the low incidence of ischemic heart disease on echocardiographic studies. Coronary angiogram and stress tests which are the preferred diagnostic modalities for ischemic heart disease are not available in our center. Congenital heart disease was uncommon in our study. Atrial septal defect was the predominant congenital heart disease. There was a case of uncorrected tetralogy of Fallot in a forty seven year old man whose complaints were only palpitations and shortness of breath. Pericardial disease found in our study was chronic pericarditis with significant effusion. They were treated as cases of tuberculous pericarditis on account of consistent clinical findings with remarkable clinical response despite absence of mycobacteria in Ziel Nelson staining of spun pericardial fluid.

CONCLUSION

Hypertensive heart disease is the most common indication for echocardiography and also the predominant cause of heart disease in Onitsha, South East Nigeria. Dilated cardiomyopathy and valvular heart disease were also common causes of heart disease in our study. Systemic hypertension is the major risk factor for other cardiovascular diseases such as stroke and coronary artery disease in Nigeria and Sub-Saharan Africa. There is need for stakeholders in the health sector to devise new strategies to improve the detection and treatment of hypertension in order to reduce the morbidity and mortality associated with this disease.

LIMITATIONS.

This study was a retrospective study and missing data was a limitation to the number of subjects we analysed. Improper information were recorded in some cases especially with age where adult was recorded in many cases instead of the real age. The unavailability of coronary angiogram, stress electrocardiography and echocardiography made it difficult to make a reliable diagnosis of ischemic heart disease.

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