

Pattern of Heart Diseases in Gombe and Environs: A 5-Year Echocardiographic Review

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Abstract

Background: Heart disease in the developing world is mainly due to nonischemic causes-hypertensive heart disease, valvular and myocardial damage from rheumatic fever, and heart muscle diseases caused by certain infectious agents, for example, cardiomyopathy from HIV infection. Peripartum cardiomyopathy is also a well-recognized cause of heart disease in developing countries. However, there is evidence of epidemiological transition toward the increasing prevalence of atherosclerotic cardiovascular disease in Sub-Saharan Africa largely because of the increasing prevalence of traditional risk factors, such as hypertension, diabetes mellitus, dyslipidemia, obesity, and cigarette smoking. **Aim:** The aim of this study was to determine the pattern of heart diseases among patients undergoing transthoracic echocardiographic evaluation between February 2012 and February 2017 at the Cardiology Unit of the Department of Medicine, Federal Teaching Hospital, Gombe, Gombe State. **Materials and Methods:** Echocardiographic data of patients from February 2012 to February 2017 were retrieved. A total of 2265 patient records were analyzed. All patients had standard resting transthoracic echocardiography including Doppler modalities where appropriate. Descriptive statistics were used in assessing the distribution of different heart diseases. **Results:** The age range of the 2265 patients was 14–89 years, with a mean age of 47.3 ± 20.1 years and a female preponderance (58%). The most common heart disease among these patients was hypertensive heart disease (41.8%) followed by cardiomyopathies (15.4%). Ischemic heart disease remains rare (0.7%) probably due to the investigative modality used in this study (resting transthoracic echocardiography). **Conclusion:** Hypertensive heart disease remains the most common heart disease among men and women in Gombe and its environs. Cardiomyopathies, although rare in certain regions of Nigeria, are quite common in Northeast Nigeria.

Keywords: Echocardiography, heart diseases, hypertension, prevalence, Sub-Saharan Africa

INTRODUCTION

Heart disease in the developing world is believed to be mainly due to nonischemic causes-hypertensive heart disease, valvular and myocardial damage from rheumatic fever, and heart muscle diseases caused by certain infectious pathogens, such as HIV cardiomyopathy and Chagas disease. Endomyocardial fibrosis, alcohol, thiamine deficiency, and peripartum cardiomyopathy (PPCM) are also well-recognized causes of heart disease in developing countries.¹ However, there is evidence of epidemiological transition toward the increasing prevalence of atherosclerotic cardiovascular disease in Sub-Saharan Africa largely because of the increasing prevalence of traditional risk factors, such as hypertension, diabetes mellitus, dyslipidemia, obesity, and cigarette smoking. The Heart of Soweto Study in predominantly urban South Africans revealed that in a population with a mean

age of 46 years, 78% had greater than one major risk factor, primarily obesity, hypertension, and smoking, although serum cholesterol was elevated in only 14%.²

Several techniques can define impaired cardiac function in clinical practice. Noninvasive techniques, particularly echocardiography as well as radionuclide scintigraphy and cardiac magnetic resonance imaging, have great value in the clinical assessment of myocardial function.³

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Echocardiography remains a key noninvasive cardiac investigative tool in the management of patients in Nigeria. It has been described as the fifth dimension in cardiovascular examination after inspection, palpation, percussion, and auscultation.⁴ The transthoracic echocardiography, the most common approach used in Nigeria, can provide comprehensive information about cardiac structure and function, helping to establish a diagnosis and guide therapy.

MATERIALS AND METHODS

Echocardiographic data of patients referred with cardiac complaints to the Cardiology Unit of Federal Teaching Hospital (FTH), Gombe, from February 2012 to January 2017 were retrieved. Of the 2340 patients' records retrieved, 2265 were analyzed, while 75 incomplete records were removed. All patients had standard transthoracic echocardiography including Doppler modalities where appropriate using the American Society of Echocardiography guideline.⁵ An I-VIS60 Digital Color Doppler Ultrasound system equipped with a 3.5-MHz transducer (Chison Medical Imaging Co. Ltd., China) was used for the echocardiography procedure. Patients were examined in the left lateral decubitus position using standard parasternal, short-axis, and apical views. Left ventricular internal dimension, posterior wall thickness, and interventricular septal thickness were measured at end-diastole and end-systole. Measurements were obtained in up to three cardiac cycles and the average recorded. All the echocardiographic-based diagnoses were made using existing standard criteria.

Ethical approval was obtained from the Ethics and Research Committee of FTH Gombe, Gombe State, Nigeria.

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 22 software (SPSS Inc., Chicago, IL, USA). Continuous variables were expressed as mean \pm standard deviation and frequency expressed as a percentage. Descriptive statistics was used in assessing the distribution of different heart diseases.

RESULTS

Two thousand, two hundred and sixty-five echocardiograms were analyzed. The ages of the patients ranged from 14 to 89 years, with a mean age of 47.3 ± 20.1 years. There were 951 (42%) men and 1314 (58%) women aged 55.4 ± 14.1 and ± 14.3 years, respectively. The male-to-female ratio was 1:1.4. The various diagnoses made based on echocardiographic findings are illustrated in Table 1.

The most common heart disease among these patients was hypertensive heart disease (41.8%). The second most common heart disease among these patients was cardiomyopathies (15.4%), dilated cardiomyopathy being the most common cardiomyopathy (98.6%) in both sexes [Table 2].

One hundred and sixty-nine of the 267 female patients (63.3%) with echocardiographic evidence of dilated cardiomyopathy met the diagnostic criteria for peripartum cardiomyopathy.

Table 1: Frequency of heart diseases in Federal Teaching Hospital, Gombe

Cardiac disease	Frequency	Percentage	Mean age (in years)
Hypertensive heart disease	948	41.8	56.5
Cardiomyopathy	349	15.4	40.0
Dilated cardiomyopathy	344	15.2 (98.6)	52.0
Others	5	0.2 (1.4)	37.6
IHD	16	0.7	52.5
Myocarditis	7	0.3	43.5
Pericardial disease	51	2.3	47.5
Pulmonary heart disease	22	1.0	51
VHD	229	10.1	52.5
Rheumatic	197	8.7 (86.1)	37.8
Degenerative	28	1.2 (12.2)	68.3
Mitral valve prolapse	4	0.2 (1.7)	33.5
Congenital heart disease	6	0.3	36
Concentric LVH	8	0.4	45
Normal echo	630	27.7	52

VHD – Valvular heart disease, IHD – Ischemic heart disease, LVH – Left ventricular hypertrophy

Table 2: Distribution of cardiac diseases among the sexes

Cardiac disease	Female	Male
Hypertensive heart disease	449	499
Dilated cardiomyopathy	267	77
VHD	156	69
Pericardial disease	26	25
Pulmonary heart disease	12	10
IHD	5	11
Concentric LVH	3	5
Congenital heart disease	1	5
Mitral valve prolapse	1	3
Myocarditis	3	4
Restrictive cardiomyopathy	2	1
Normal echocardiogram	388	241

VHD – Valvular heart disease, IHD – Ischemic heart disease, LVH – Left ventricular hypertrophy

Hypertrophic obstructive cardiomyopathy was diagnosed in an adult male patient, while a case of left ventricular noncompaction was documented in a 15-year-old boy.

Normal findings were documented in 27.7% of the echocardiograms, with the majority being from the female clients (61.7% of the normal echocardiograms).

Valvular heart disease (VHD) of various etiologies was diagnosed in 229 (9.9%) of the patients. Rheumatic heart disease was the most common VHD, with the mitral valve being the most affected valve (127 cases). Four cases of mitral valve prolapse were documented (1.7%). Degenerative VHD was seen in older patients and predominantly affected the aortic valve.

Congenital heart disease was seen in 0.3% of the patients, with most of them being ventricular septal defects.

DISCUSSION

The mean age of 47.2 years in this study was higher than the mean age of 39.6 years in a similar study in Maiduguri, Nigeria.⁶ However, the mean age aligned with the findings in Ile-Ife (Southwestern Nigeria) and Enugu (Southeastern Nigeria).^{7,8}

The finding of hypertensive heart disease being the most common heart disease agreed with previous publications from Nigeria.⁶⁻⁸ Hypertensive heart disease is a complication of hypertension, which is the most prevalent cardiovascular disease in Sub-Saharan Africa.⁹

Peripartum cardiomyopathy, a common cardiomyopathy in our environment, is the second most common heart disease among women in Northeastern Nigeria.⁶ However, this heart disease seems to be rare (<2%) in Southwest and Southeast Nigeria.^{7,8} Explanations for these marked differences observed in different regions of the same country are complex. The existence of certain cultural practices in Northern Nigeria, for example, the ingestion of rock salt (rich in sodium and potassium) as well as hot water baths by parturients during puerperium, has been associated with PPCM.⁹ Micronutrient deficiencies (particularly Selenium) resulting from endemic malnutrition in Northeastern Nigeria have also been reported as a risk factor for the development of PPCM.⁹ Nigeria being a heterogeneous country consisting of different tribes with different ethnologies may have populations with varying degrees of genetic predisposition to the development of PPCM.^{10,11}

VHD of varying etiologies constituted the third most common heart disease with a prevalence of 10.1% in patients 14 years and older. The predominant etiology was rheumatic heart disease, diagnosed in 86.1% of all VHD, a finding similar to reports from other centers in Nigeria.⁶⁻⁸

Ischemic heart disease (IHD) in line with global estimates was relatively rare (0.71%). However, IHD has recognized risk factors, such as hypertension, diabetes mellitus, dyslipidemia, obesity, and cigarette smoking. These risk factors are increasing in prevalence in Sub-Saharan Africa.² The reported low prevalence of IHD in Nigeria despite increasing prevalence of its risk factors may be as a result of the technique of cardiac evaluation commonly used in Nigerian health institutions – the resting transthoracic echocardiography. Stress electrocardiography, stress echocardiography, and computed tomography angiography have been reported to provide better evaluation of IHD.¹² Increasing use of these investigative tools may enhance the diagnosis of IHD in our community.

A normal echocardiogram was the second most common finding on echocardiography (27.7%). This may have been as a result of the heterogeneous nature of the source of referrals for echocardiography for indications such as abnormal electrocardiogram, work-up for chemotherapy in oncology patients, and evaluation of chest pain.

CONCLUSION

Hypertensive heart disease remains the most common heart disease among men and women in Gombe and its environs. Cardiomyopathies, though rare in certain regions of Nigeria, are quite common in Northeast Nigeria.

Making standard transthoracic echocardiography protocol to include both resting and stress echocardiographic cardiac parameters may increase the likelihood of diagnosing IHD in patients in this region of the world.

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Conflicts of interest

There are no conflicts of interest.

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