



# THE CENTRAL AFRICAN JOURNAL OF MEDICINE

Vol. 61, Nos. 1/4

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January/April 2015

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# An echocardiography audit to determine and characterise rheumatic heart disease lesions seen in 2012

NT MUNYANDU

## Abstract

**Introduction:** Rheumatic heart disease is still a common problem in Zimbabwe. It has a significant mortality rate due to heart failure, stroke or endocarditis. Timely surgical interventions can reduce mortality. An echocardiography audit was performed to determine the proportion of patients referred for echocardiography who had a diagnosis of rheumatic heart disease, the pattern of valvular involvement and the presence of surgical indications on echocardiography.

**Objective:** To determine the number of echocardiograms done in 2012 and the proportion with a diagnosis of rheumatic heart disease. To determine which valve lesions were present and whether there were any echocardiographic indications for surgical intervention.

**Method:** A record review of all echocardiograms performed by the investigator during the period January to December 2012 was performed. A data collection form was used to extract the data and the findings were tabulated and analysed.

**Results:** Three hundred and eight (308) echocardiograms were performed by the investigator during the year of review. 236 of these were abnormal and rheumatic heart disease was diagnosed in 16% of them. The commonest valve lesion was mitral regurgitation and half of the patients had surgical indications. The common complications were pulmonary hypertension and left atrial enlargement.

**Conclusion:** This audit shows that rheumatic heart disease is still quite common in patients referred for echocardiography. Lesions are severe and the majority of patients are in need of surgical intervention.

*Cent Afr J Med 2015;61(1/4):17-20*

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## Introduction

It is estimated that 2 to 4 million children aged 5 to 14 years are affected by rheumatic heart disease globally. 15,6 to 19,6 million people are living with rheumatic heart disease globally and 79% of these are from developing countries. This translates to an all age prevalence rate of 2,5-3,2 cases / 1000.<sup>1</sup>

The mortality from complications of rheumatic heart disease is significant with 1,5% of those with rheumatic heart disease dying each year. The estimated number of deaths globally is 230 000- 294 000 yearly.<sup>2</sup> The causes of death include heart failure, stroke and infective endocarditis.

Interventions for rheumatic heart disease are three pronged. There is primary prevention which involves socio-economic and political approaches such as poverty alleviation, education of the public to be aware of the complications of streptococcal sore throat and provision of adequate health care facilities to detect and treat streptococcal infections and their complications appropriately. Secondary prevention is the other level of intervention. This involves the diagnosis of acute rheumatic fever and follow up of the patients and offering penicillin prophylaxis to prevent recrudescence and hence reduce valvular damage. The last intervention is for those who develop chronic valvular damage. They need medical as well as timely surgical interventions. This is costly and in most developing countries particularly in Sub-Saharan Africa the facilities for surgery are limited.

In Zimbabwe open heart surgery is currently not available. There is a suspicion from clinical practice that in Zimbabwe we are seeing advanced valvular lesions from rheumatic heart disease which need surgical intervention. There is no local data to demonstrate the burden of this disease. It is essential for policy makers to have such data to make decisions regarding provision of services. The best estimate of the burden of disease would be from a population based survey but this is quite costly and time consuming. It however needs to be done. A hospital based survey has some use to describe the symptomatic and more severe lesions. An audit of patients referred for echocardiography to Parirenyatwa hospital was performed to describe the patients with rheumatic heart disease and characterize the lesions seen and to determine what proportion of them have surgical indications.

### Objectives

- To determine the number examinations done in 2012 by one of the doctors regularly performing echocardiography.
- To determine the proportion that had a diagnosis of rheumatic heart disease.
- To determine the number of valves involved, the severity and presence of complications.
- To determine the proportion with surgical indications.

## Materials and Methods

### Setting

The audit was done on patients seen in one of four adult echocardiography clinics which run at Parirenyatwa hospital a tertiary institution. Patients who are referred there come from medical wards, medical clinics, provincial hospitals, district hospitals, primary care facilities as well as other specialties such as surgical disciplines and oncology. The majority of patients are from the medical wards and would have presented in cardiac failure.

### Sampling

All echocardiography studies done during that year in the Department of Medicine by the investigator were included.

### Data collection

Records of all echo studies done by the investigator that year were retrieved and a data collection form was used to collect the required information. This was entered onto an excel spreadsheet and later put into Stata 12 for analysis.

### Data analysis

The data was analysed using Stata 12. Means and standard deviations were calculated to describe the patient population for those characteristics with a normal distribution. Proportions were used for categorical data. Frequency of each valve involvement and grades of severity and proportions with complications were derived from the data.

### Ethical Considerations

This is a record review where patient identifiers were not used when data was collected so it was deemed not to cause any risk to the patients or breach of confidentiality of patient information.

## Results

Three hundred and eight (308) echocardiography studies were performed by the investigator from January 2012 to December 2012.

Table I: Patient characteristics.

Characteristic	Result
<b>Age (n=280)</b>	
Mean	52.1 years (SD 21.2)
Range	10 - 100 years
<b>Age for the sub group with RHD (n=34)</b>	
Mean	41.7 years
Range	10 - 82 years
<b>Gender (n=308)</b>	
Female	196 (64%)
Male	112 (36%)
<b>Gender for the RHD sub group (n=38)</b>	
Female	23 (61%)
Male	15 (39%)

Tabulated below is the distribution of patients in the diagnostic categories. 23.4% were normal echo studies.

Of the 236 abnormal echocardiograms 38 (16%) had a sole diagnosis of rheumatic heart disease and 2 patients had both rheumatic heart disease and hypertensive heart disease or cardiomyopathy. The diagnosis of rheumatic heart disease on echocardiography was based on morphological and Doppler criteria as set out in the World Heart Federation criteria.<sup>3</sup>

*Table II: Distribution of patients in the diagnostic categories.*

Diagnosis	Number	Proportion (%)
Hypertensive heart disease	90	38
Cardiomyopathy	50	21
Rheumatic heart disease	38	16
Cor pulmonale	11	5
Pericardial disease	15	6
Congenital heart disease	11	5
Others	16	7
Two diagnosis	5	2

*Table III: Frequency of valvular involvement.*

Mitral regurgitation	Frequency	Proportion (%)
Total with MR and RHD	31	82
Mild MR	8	21
Moderate MR	10	26
Severe MR	13	34

*Table IV: Frequency of valvular involvement.*

Mitral stenosis	Frequency	Proportion (%)
Total	16	42
Mild	2	11
Moderate	5	13
Severe	7	18

*Table V: Frequency of valvular involvement.*

Aortic valve and tricuspid valve	Frequency	Proportion (%)
Aortic regurgitation	19	50
Aortic stenosis	2	5
Tricuspid regurgitation	26	68

### **Frequency of complications of RHD**

The estimated pulmonary artery pressure was measured in 25 of the 38 rheumatic heart disease patients and the mean was 39 mmHg (SD 35). Vegetations were present in 2 of the 38 patients. The left atrial size was measured in 35 of the 38 RHD patients and the size ranged from 30 to 73mm with a mean of 50mm a SD 11. The ejection fraction ranged from 22 to 90 % in the 38 patients. The mean was 57%. The complications that have been described here are only those determined on echocardiography. The patients may however have had other complications

that are picked up on history and clinical examination such as signs and symptoms of cardiac failure and stroke.

Nineteen (19) out of the 38 patients (50%) with RHD had at least one echocardiographic surgical indication<sup>5,6</sup> and only one had a prosthetic valve that had been replaced previously.

## **Discussion**

Rheumatic heart disease is a fairly frequent diagnosis in patients who are referred for echocardiography at Parirenyatwa hospital accounting for 16 % of abnormal echocardiograms. The patients are quite young with a mean age of 41.7 years. There are more female patients seen than male patients. The most frequent lesion is mitral regurgitation and the majority of patients with mitral regurgitation have severe mitral regurgitation. Tricuspid regurgitation occurs quite frequently but in all of these patients it was thought to be secondary to pulmonary hypertension from left valve disease as opposed to direct rheumatic valvular damage. There is a high rate of left atrial enlargement which makes atrial fibrillation a very likely complication in these patients. Most of the patients have raised pulmonary pressure and echocardiographic surgical indications are present in half of the cases seen. It was a positive finding that the mean ejection fraction in these patients is normal so they can still have successful interventions.

This audit was done only on patients seen by one of four echocardiographers. The patients referred to all the clinics are similar and this is meant to be a sample representative of what is being seen in all the other echocardiography clinics.

## **Study Limitations**

This study is a hospital based audit which means that the patients seen are a reflection of the severe end of the spectrum of patients with rheumatic heart disease. It is in no way an indicator of the prevalence or severity in the general population. It however is an indicator of the severity and frequency of lesions in symptomatic patients. It would have been desirable to look at all the echocardiograms done in that year but this was not possible. However this represents what is seen in all those clinics as the referrals are similar. Clinical information on referred patients is not always complete so the clinical indications for surgery were not explored. The audit focused on echocardiographic indications so if anything the need for surgery is actually underestimated in this audit.

## **Conclusion**

Rheumatic heart disease is still common, patients are presenting with advanced lesions and frequently they have surgical indications. Although the lesions are severe the left ventricular function in most of the

patients is still good which means that they can still have successful interventions. The commonest valvular lesion is mitral regurgitation and is severe in most cases. There is need to consider availing open heart surgical services in Zimbabwe.

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### Data Collection Questionnaire

**Number:** \_\_\_\_\_

**Initials:** \_\_\_\_\_

**Age:** \_\_\_\_\_

**Gender:** 1 Female  
1 Male

**Diagnosis:**

0. Normal
1. Hypertensive heart disease
2. Cardiomyopathy (includes idiopathic peripartum alcohol induced)
3. Rheumatic heart disease
4. Cor pulmonale
5. Pericardial disease
6. Congenital heart disease
7. Others (ischaemic, degenerative valvular heart disease etc)

**LA Size:** \_\_\_\_\_

**LV Size:** \_\_\_\_\_

**EF:** \_\_\_\_\_

**MR**            0. None            1. Mild            2. Moderate            3. Severe

**MS**            0. None            1. Mild            2. Moderate            3. Severe

**MVA:** \_\_\_\_\_

MV calcification            0. No            1. Yes

AR            0. No            1. Yes

AS            0. No            1. Yes

TR            0. No            1. Yes

**PAP:** \_\_\_\_\_

Vegetation            0. No            1. Yes

Surgery indicated            0. No            1. Yes



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