

Pattern of Heart Valve Involvement in Rheumatic Heart Disease

Koju R,* Gurung R,* Pant P*, Pokharel B,* Bedi TRS*

*Dhulikhel Hospital, Kathmandu University Hospital

Corresponding Author: Dr. Rajendra Koju,
Dhulikhel Hospital, Kathmandu University Hospital, Dhulikhel Nepal
Email: koju@mos.com.np

Abstract

Rheumatic heart disease is the most important consequence of acute rheumatic fever. Both are common cardiovascular problems in Nepal. Echocardiographic detection of rheumatic heart disease is important to establish the diagnosis. The involvement of valves and their severity guides the therapeutic options. A total of 133 valvular heart disease cases attended in Dhulikhel Hospital between July 2008 to June 2009 were analyzed. Fifty-one patients, in whom the problems were rheumatic in origin were studied. Among them, 12% (6) had isolated aortic valve involvement, 35% (18) had isolated mitral valve and 53% (27) had mixed involvement. Severe mitral stenosis accounts for 24% of all mitral stenosis and severe aortic stenosis is 20% for all aortic stenosis. The rates for severe mitral regurgitation and severe aortic regurgitation are 30% and 28% respectively. Although the study population has a high number of female patients, the differences in the rates of involvement of aortic or mitral valve in both genders are statistically insignificant. The study, although small, confirms that in this population, females are more commonly affected, that the mitral valve is the most commonly damaged valve and that disease affecting multiple valves is marginally more common than isolated valve disease. The detection of valvular involvement at different stages can guide the therapeutic options.

Keywords : Rheumatic heart disease, rheumatic fever, echocardiography

INTRODUCTION

Rheumatic heart disease is the most important consequence of acute rheumatic fever. Rheumatic fever is non-suppurative complication of group A streptococcal pharyngitis due to a delayed immune response. Rheumatic fever usually occurs in childhood, affecting 5-15 year olds.

Rheumatic heart disease used to be a common cardiovascular problems of developed countries, which now continues to be a common health which now continues to be a common health problem in the developing world, causing morbidity and mortality among both children and adults. Rheumatic fever and rheumatic heart disease are common cardiovascular problems in Nepal.

Different school survey in Nepal reported the prevalence of rheumatic heart disease is high. Both rheumatic fever and rheumatic heart disease are more common in females.

However rheumatic heart disease can present in adults from aged 20 to 30 years. In 20% to 30% of such cases, there is no cardiac involvement, but patient often contract rheumatic fever more than once, and the damage is cumulative. Rheumatic heart valve lesion is progressive which lead to congestive cardiac failure.

Echocardiography is the important tool to detect rheumatic carditis and valvular morphology. 2D M-mode and doppler echocardiography can detect that valvular pathology, which is missed in clinical auscultation. It may over-diagnose trivial regurgitation because of its high sensitivity, and such trivial abnormalities, in the absence of any other abnormalities, can be disregarded.

The involvement of valves in rheumatic heart disease is very important from the therapeutic point of view. The treatment options depend upon the severity and type of valve involvement. This study aims to find out the pattern of involvement of heart valves and their severity.

METHODOLOGY

A total of 133 patients attending Dhulikhel Hospital with echocardiographically confirmed valvular heart disease between July 2008 to June 2009 were studied. Of this group 51 patients were having rheumatic heart disease. To be included in this group patients had either 1) a past history of rheumatic fever satisfying the revised Jones' criteria or 2) a pattern of morphological change on echocardiography consistent with a rheumatic heart disease causation once all other possible aetiologies had been excluded.

The transthoracic echocardiographic examination of the heart valves was performed with Toshiba Power Vision 6000 echocardiography machine. The grading of the stenosis was done with planimetry and pressure half time in mitral valve and peak pressure gradient in aortic valve. The grading of the valve regurgitation was done according to the regurgitant jet size and proximal jet width. Both stenosis and regurgitation was graded into Mild, Moderate or Severe.

The data was analyzed using SPSS 13.0.

Table 1: Age and Sex distribution of study population.

Age group	SEX		Total
	Male	Female	
Less than 15	3	3	6
16-30	5	15	20
31-45	2	15	17
More than 46	2	6	8
Total	12	39	51

Table 2. Mitral Stenosis

Mitral Stenosis	Sex		Total
	Male	Female	
Mild	3	7	10
Moderate	0	9	9
Severe	1	5	6
Total	4	21	25
Total	12	39	51

RESULT

This study looked at all patients presenting to the cardiology department of Dhulikhel Hospital Over a period of a year.

A total of 51 patients having echocardiographically confirmed rheumatic heart disease were studied. Of this group 39 (76.5%) were female and 12 (23.5%) male. The mean age of study population was 32.82±15.33 (standard deviation). The minimum age was 8 years and the maximum was 64 years. The majority of patients in this study were in the 16-30 age group.

Table 3. Mitral Regurgitaion

Mitral Regurgitaion	SEX		Total	Percentage
	Male	Female		
Mild	3	3	6	16.9
Moderate	6	14	20	
Severe	1	10	11	
Total	10	27	37	
Total	12	39	51	

The majority of patients had mitral valve involvement with regurgitation proving more common than stenosis. Mixed mitral valve disease and mixed mitral and aortic valve disease were found. Female patients accounted for 84% of mitral stenosis and 73% fo mitral regurgitation.

Aortic valve involvement was less common than mitral valve. Again females account for the greater number of cases with 66% for aortic stenosis and 71% for regurgitation. Isolated mitral valve involvement was 3 times more than aortic valve involvement. In 50% of cases mixed mitral and aortic valve involvement was demonstrated.

Table 4. Aortic Stenosis

Aortic Stenosis	SEX		Total
	Male	Female	
Mild	2	4	6
Moderate	2	4	6
Severe	1	2	3
Total	5	10	15
Total	12	39	51

Table 5. Aortic Regurgitaion

Aortic Regurgitaion	SEX		Total
	Male	Female	
Mild	2	3	5
Moderate	4	14	18
Severe	3	6	9
Total	9	23	32
Total	12	39	51

In the study population 21 patients had secondary tricuspid regurgitaion graded from mild to severe. A pulmonary artery systolic pressure greater than 30 mmHg (calculated from the tricuspid regurgitation velocity plus 10 mmHg) was shown in 19 patients. No patients had pulmonary valve involvement in this study.

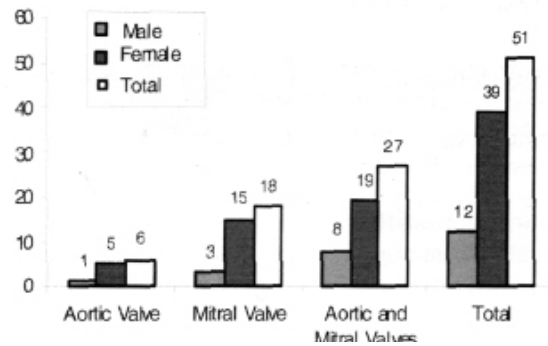


Figure 1: Involvement of valves

Isolated aortic or mitral valve involvement rates are not significantly different (p > 0.05) in male and female. However, when all valve involvements are considered, females are more commonly affected.

DISCUSSION

The valvular abnormalities of rheumatic heart disease are the most important consequences of acute rheumatic fever and one of the commonest presentations of cardiovascular disease in hospitals in developing countries. The valvular lesions are progressive in nature and lead to congestive cardiac failure. Often rheumatic heart disease is asymptomatic and with no evidence of earlier acute rheumatic fever. In some cases rheumatic heart disease is diagnosed incidentally.

Echocardiographic examination of rheumatic heart disease is important to detect and confirm the diagnosis, where clinical assessment is unreliable.

In the study patients with the valve abnormalities of rheumatic heart disease accounted for 38% of patients with valve disease. Female patients are more commonly affected. Rheumatic fever is more common in 5-15 years children. This study found more rheumatic heart disease among 16-45 years adults. The valvular involvement after rheumatic fever varies across geographical areas and depend upon socioeconomic status, rheumatic recurrence and severity of carditis.

Table 7. Pattern of mitral valve lesion

	SEX		Total
	Male	Female	
Mitral Stenosis	2	4	6
Mitral Regurgitation	1	5	6
Mitral Stenosis	1	10	11
Regurgitaion	6	6	6
Total	3	15	18

When rheumatic heart disease is present the mitral valve is most commonly affected. Isolated mitral valve involvement accounts for 35% of all rheumatic heart disease whereas the figure for isolated aortic valve is 12%. The remaining 53% have mixed aortic and mitral valve involvement. Tricuspid regurgitation found in these patients is secondary to left sided valvular disease. The combination of valve involvement is often asymptomatic, with one valve having dominant dysfunction and other valve being less severely affected. Although the study population has high number of female patients, the differences in the rates of involvement aortic or mitral valve in both genders are statistically insignificant.

Table 8. pattern of aortic valve lesion

	SEX		TOTAL
	Male	Female	
Aortic Stenosis	0	0	0
Aortic Regurgitation	0	4	4
Aortic Stenosis	1	10	11
Regurgitation	1	1	2
Total	1	5	6

Severe mitral stenosis accounts for 24% of all mitral stenosis. Severe aortic stenosis is 20% of all aortic stenosis. The rates for severe mitral regurgitaion and severe aortic regurgitation are 30% and 28% respectively. Meira et.al. studied 258 children and adolescents with acute rheumatic fever in Brazil and showed that 72.1% developed rheumatic valvular lesion. Among them 15.9% were severe. The severity depends upon the severity of carditis, mother's schooling, family income, rheumatic recurrences. The more severe patients found in out study could be due to the inclusion of already registered and treated cases.

In this study regurgitation was more common in patients

with combined lesions of mitral and aortic valve than stenosis.

The study, although small, confirms that in this population females are more commonly affected. That the mitral valve is the most commonly damaged

Table 9. Pattern of combined valvular lesion of mitral and aortic valve

	SEX		TOTAL
	Male	Female	
MSAS	0	1	1
MSAR	0	2	2
ASMR	000		
ARMR	3	3	0
MRASAR	2	3	5
MS MRAR	1	4	5
MS ASAR	0	3	3
MS MR ASAR	2	3	5
Total	8	19	27

Valve and that disease affecting multiple valves is marginally more common than isolated valve disease.

The detection of valvular involvement at different stages can guide the therapeutic options. Mild to moderate grades of valvular involvement without symptoms or minimal symptoms may be managed with secondary prophylaxis of rheumatic fever and other medical therapy. Severe grades of valvular involvement need surgical intervention-either repair or replacement.

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