

# PATTERN OF VALVULAR LESIONS IN RHEUMATIC HEART DISEASE

Mohammad Faheem, Mohammad Hafizullah, Adnan Gul,  
Hikmatullah Jan, Mohammad Asghar Khan

Department of Cardiology,  
Postgraduate Medical Institute, Lady Reading Hospital, Peshawar, Pakistan

## ABSTRACT

**Objective:** To evaluate relative frequency of cardiac lesions in Rheumatic heart disease (RHD) in patients presenting to cardiology department, Lady Reading Hospital, Peshawar.

**Material and Methods:** This retrospective study was conducted at Cardiology Department Lady Reading Hospital Peshawar. The data on patients undergoing transthoracic two-dimensional echo and Doppler studies were retrieved from the computerized database from July 2003 to July 2006. The data was analysed with SPSS 11 window.

**Results:** Out of 3060 patients of RHD (1278 male and 1782 female), 1723 (56.3%) had mixed valvular lesions. Mean age was 22 + 6 years. Mitral stenosis (MS) was the predominant valvular lesion affecting 2141 (70%) patients (1040 pure MS and 1101 in combination). Of those, 525 (24.5%) patients had severe MS, and 811 (37.9%) had moderate MS. Mitral regurgitation (MR) affected 1793 (58.59%) patients (245 pure MR, 1548 mixed) while 404 (22.5%) patients had severe MR and 497 (27.1%) had moderate MR. Aortic regurgitation (AR) was present in 1438 (47%) patients and almost always (98.85%) in combination. One hundred and eight (7.5%) patients had severe AR. Aortic stenosis (AS) was noted in 48 (1.56%) patients, of which 30 (62.5%) were in isolation and 18 (37.5%) in combination. Out of 1723 mixed lesions, MS+MR+AR were found in 826 (47.94%) cases and MR+AR in 428 (24.84%) cases.

**Conclusion:** Most of the patients had mixed Valvular lesions. The predominant lesion was mitral stenosis followed by mitral regurgitation, aortic regurgitation and aortic stenosis respectively.

**Key words:** Mitral Regurgitation, Mitral Stenosis, Aortic Regurgitation, Aortic Stenosis, Rheumatic Heart Disease.

## INTRODUCTION

Rheumatic heart disease (RHD) is the most common cardiovascular disease in children and young adults.<sup>1</sup> Although in developed countries it has declined, it is still a major public health problem in developing world.<sup>2</sup> In Pakistan RHD is one of the leading causes of premature death and disability.<sup>3</sup> The prevalence is quite high in both rural as well as urban population of Pakistan.<sup>4,5</sup> The contributing factors being poverty, illiteracy, over crowding, and poor access to health.<sup>1</sup> RHD results from recurrent attacks of rheumatic fever, which is an inflammatory disease that occurs as a delayed sequelae to group A streptococcal pharyngitis.<sup>6</sup> One of the hallmark of this multi system disease is rheumatic carditis.<sup>7</sup> As the disease is usually recurrent<sup>8</sup> and progressive, rheumatic carditis ultimately leads to different valvular lesions.

**Present** study was therefore designed as to determine the relative frequency of different types of valvular involvement in patients with RHD presented to cardiology department, Lady Reading Hospital, Peshawar.

## MATERIAL AND METHODS

This retrospective study was conducted at department of cardiology, Postgraduate Medical Institute, Lady Reading Hospital Peshawar. Being the major tertiary care hospital, patients are referred from all over the North West Frontier Province for opinion and conformation of diagnosis. This study was conducted in patients diagnosed as having rheumatic heart disease based on echocardiographic examination, from July 2003 to July 2006. The record of all patients referred for echocardiography was reviewed. Detailed transthoracic two- dimensional and doppler studies

## FREQUENCY OF BOTH PURE AND MIXED VALVULAR LESIONS IN RHEUMATIC HEART DISEASE

Valvular Lesion	Number of patients	% age of Total
Mixed	1723	56.30%
Pure Mitral stenosis	1040	33.98%
Pure Mitral regurgitation	245	8.0%
Pure Aortic stenosis	30	0.98%
Pure Aortic regurgitation	22	0.71%
Total	3060	100%

Table 1

were done on all cases by experienced echocardiographers and reviewed by consultants for conformation of diagnosis. Echocardiography was performed in accordance with the American College of Cardiology/American Heart Association guidelines using GE.RT 6800 and Siemens Acuson CV-70 ultrasound system.<sup>9,10</sup>

All echocardiographic data was saved in purpose built software running under multi user UNIX OS and FOXPRO database. Echo reports were analyzed from this database. All patients after under going echocardiography were divided in to different categories for example Ischaemic Heart Disease (IHD), Rheumatic Heart Disease (RHD), Congenital Heart Disease (CHD), cardiomyopathies etc. All those patients who had rheumatic heart disease were included in this study. Patient who had diagnosis other than RHD were excluded from the study. All the results were analyzed on SPSS version 11.

## RESULTS

A total of 25,303 patients under went echocardiography during these three years. Three thousands and sixty (12.1%) patients were labeled to have RHD. Out of 3060 patients 1278 (41.76%) were male and 1782 (58.23%) were female. Their ages ranged from 5 year to 80 years (mean age 22 ± 6years).

Table 1 shows the frequency of pure and mixed valvular lesions in rheumatic heart disease. Out of 3060 patients of RHD, 1723 (56.3%) had mixed valvular lesions. Table 2 shows detailed results of individual valvular lesion as divided into pure and mixed subgroups.

Mitral stenosis was the most frequent valvular lesion affecting 2141(70%) of the total number of patients. Of these 814 (38.07%) were male and 1327(61.98%) were female. Pure Mitral stenosis was found in 1040 (48.6%) patients and the 1101 (51.4%) were in combination. Of those, 525 (24.5%) patients had severe MS, while 811 (37.9%) and 805 (37.6%) patients were having

moderate and mild mitral stenosis respectively.

The next commonest valvular lesion was mitral regurgitation, affecting 1793 (58.59%) of the total patients. Of these only 245 (13.7%) were in isolation and 1548 (86.3%) had mixed valvular disease. Male were 735(40.99%) and female were 1058(59.01%). Four hundred and four (22.5%) of these patients were having severe MR, while moderate and mild MR was present in 497(27.7%) and 892 (49.7%) patients respectively.

Aortic regurgitation was present in 1438(47.79%) of the total patients. In 98.85% patients it was in combination with some other valvular lesion. Of these 676(47.01%) were male and 762(52.99%) were female. Out of 1438 patients, 108 (7.5%) patients were having severe AR.

Aortic stenosis (AS) was noted in 48 (1.56%) patients, of which 30 (62.5%) were in isolation and 18 (37.5%) in combination. Male were 37(77.08%) and female were 11(22.99%).

Out of 1723 mixed lesions, MS+MR+AR were found in 826 (47.94%) cases and MR+AR in 428 (24.84%) cases (table 3). Mitral Regurgitation was found to be present in almost every combination.

## DISCUSSION

Although in western countries RHD is now very rare, it remains a major public health problem in developing countries.<sup>11</sup> In Pakistan, the prevalence of RHD, as shown by recent studies<sup>4,5</sup> has been the same over the last few decades. In our study RHD was more common in younger age group. Our findings matches that of Sharma M.<sup>12</sup> The reason may be that group A streptococcal infection and consequently rheumatic fever commonly affects younger school going children. Another study shows that in western population showed both sexes to be equally affected by the disease.<sup>13</sup> But in our study females were affected more than male. This finding coincides with another study reported from our country.<sup>14</sup> The reason may be our social norms and cultural set up where most of the females remain house bound

## RESULTS OF INDIVIDUAL VALVULAR LESION AS SUB GROUPED IN TO PURE AND MIXED VARIETIES

Valvular Lesion	Pure (n=1337)	Mixed (n=1723)	Total (n=3060)
Mitral stenosis	1040	1101	2141
Mitral regurgitation	245	1548	1793
Aortic regurgitation	22	1416	1438
Aortic stenosis	30	18	48

Table 2

## FREQUENCY OF DIFFERENT COMBINATIONS OF VALVULAR LESIONSPRESENT IN 1723 PATIENTS WITH MIXED VALVULAR LESIONS

Combinations of Valvular Lesions	Frequency (n=1723)	%age
MS, MR, AR	826	47.94
MR AR	428	24.84
MS, MR	215	12.48
OTHERS	254	14.74

MS=Mitral stenosis  
MR=Mitral regurgitation  
AR=Aortic regurgitation

Table 3

and have no free access to health. We did not find any study which clearly mentioned any scientific reason for female predominance of the disease.

In our study many of the patients had mixed valvular lesions, showing an advanced stage of the disease. The reason may be that it was a hospital based retrospective study. Old echo records of those patients referred for echocardiography to a tertiary care hospital were analysed. We all know that in our setup where a large population lacks primary health facilities, most of patients reach a tertiary care hospital when they already have advanced disease. Another reason may be that early detection of rheumatic fever may be easily missed by many physicians. The patients then present in their first visit, with already established rheumatic heart disease. There is long chain of causes relating both to patient as well as doctors who contribute to this late diagnosis. Poverty, illiteracy, lack of awareness, and poor health facilities are all hindrance in early diagnosis. Primary health care givers contribute in a way that they easily miss the early symptoms of rheumatic fever. It has been observed that the clinical picture of rheumatic fever is different in different age groups<sup>15</sup> as well as in different regions and populations.<sup>16</sup> It is also different in patients with first episode and those with recurrent attacks.<sup>17</sup> This causes problem in early diagnosis. To facilitate early diagnosis the Duckit John criteria has been revised,<sup>18</sup> because over diagnosis of rheumatic fever is not as harmful as under diagnosis. Ours is a high prevalent area, so our local guidelines have also been made with the intention not to miss the initial episode of rheumatic fever.<sup>19</sup>

Another reason is that even if it is diagnosed early, our primary physicians have a tendency to with hold secondary prophylaxis. If the patient is started treatment for secondary prophylaxis, poor compliance with the long-term painful injections of Benzathin penicillin also encourages progression of the disease to severe

forms<sup>20</sup>. a study reported the efficacy of Benzathin penicilline brands used was doubtful.<sup>21</sup> At the end of the chain are those patients with rheumatic heart disease whose misery is added to by delay in timely surgery due to high expenses, lack of education and some times due to patient reluctance.<sup>21</sup> When considering individual valves, mitral valve was the most commonly affected valve in our study which coincides with the findings of other studies<sup>22,23</sup>. Mitral stenosis was the predominant valvular lesion. But in many studies mitral regurgitation was the dominant valvular lesion. But cause for predominance of mitral valve involvement by the disease is uncertain.<sup>24,25</sup>

Those patients with advanced RHD sooner or later require surgery in the form of valvuloplasty or valve replacement. In developing countries the large number of surgical procedures on patients with RHD has been described as "attempting to mop up the floor while leaving the faucet open".<sup>26</sup> Therefore stress should be given on preventive strategies which are quite reliable and cost effective. Primary prevention of acute rheumatic fever needs identification of group A streptococcal infection by means of throat swab culture and then treating them.<sup>27</sup> This job is very difficult in our setup. Secondary prophylaxis with long-term benzathine injection is a cost effective approach. Timely surgery may be under taken for those patients who already have advanced disease. Experience in this regard can be shared neighbor countries.<sup>28</sup> After inclusion of RHD in the national action plan for prevention and control of non-communicable diseases, we hope some improvement in the situation after a few years.<sup>29</sup> This was a retrospective analysis of the echocardiographic data and included only those patients referred to a tertiary care hospital. No clinical date, other investigation and follow-up information about the patients were available. These results are not applicable to the general population because of referral bias to a tertiary care hospital.

## CONCLUSION

Rheumatic heart disease is still a common problem. In our study most of the patients had mixed valvular lesions. The predominant lesion was mitral stenosis followed by mitral regurgitation, aortic regurgitation and aortic stenosis respectively.

## REFERENCES

1. Rheumatic fever and Rheumatic heart disease. World health organ Tech Rep Series 2004; 923: 1-22.

2. Rheumatic fever and rheumatic heart disease. Report of WHO study group. Technical report series No. 764, Geneva WHO, 1998.
3. Hyder AA, Morrow RH. Applying burden of disease methods in developing countries; a case study from Pakistan. *Am J Public Health* 2000; 90: 1234-40.
4. Sadiq M, Islam K, Abid R, Latif F, Azhar M, Khan JS. Proceedings of the symposium on rheumatic heart disease. Prevalence of RHD in school children of Inner Lahore, Islamabad, Pakistan. Sept. 26, 2003.
5. Rizvi SF, Khan MA, Kundi A, Marsh DR, Samad A, Pasha O, et al. Status of rheumatic heart disease in rural Pakistan. *Heart* 2004; 90: 394-9.
6. Guil herme L, Khalil J. Rheumatic fever: From sore throat to autoimmune heart lesions. *Int Arch Allergy Immune* 2004; 134: 56-64.
7. Binolto MA, Guilherme L, Tantare AC. Rheumatic fever. *Images Pediatr Cardiol* 2002; 11: 12-5.
8. Chagani HS, Aziz K. Clinical profile of acute rheumatic fever in Pakistan. *Cardiol Young* 2003; 13: 28-35.
9. Cheitlin MD, Alpert JS, Armstrong WF. ACC/AHA guideline for the clinical application of echocardiography: A report of the American College of Cardiology/American Heart Association Task force on Practice guideline (Committee on clinical Application of Echocardiography). *Circulation* 1997; 95: 1686-87
10. Douglas Ps, Foster E, Gorscan J. ACC/AHA clinical competence statement on echocardiography. A report of the American College of Cardiology/American Heart Association/American College of Physicians/American Society of internal medicine. Task force on clinical competence (Committee of Echocardiography) *J Am Coll Cardiol* 2003; 41: 687-89.
11. Regmi PR, Pandey MR. Rheumatic fever and RHD in school children of Kathmandu city. *Indian Heart J* 1997; 49: 518-20.
12. Sharma M, Saxena A, Kothari SS. Acute rheumatic fever in children: experience from a cardiac centre. *Indian Heart J* 1999; 51: 652-53.
13. Dajani AS. Rheumatic fever. In: Braunwald E, Ziper DP, Libby P, editors. *Heart disease, a textbook of cardiovascular medicine*. 6th ed, Philadelphia: WB Saunders 2001; 2192.
14. Khan RF, Imtiaz Y, Ali H, Khan MU, Ali M, Riaz N, et al. Natural history and relative distribution of different valvular heart diseases in Mayo hospital, Lahore. *Ann K E Med Coll* 2002; 8: 90-1.
15. Tani LY, Veasy LG, Minich CL, Shaddy RE. Rheumatic fever in children younger than 5 years; is the presentation different? *Pediatrics* 2003; 112: 1065-8.
16. Gandapur AJ, Rahim F, Asgahr AH, Sahfique M, Hameed A, Khawar N. Changing clinical pattern of Rheumatic fever at Peshawar (Pakistan). *J Postgrad Med Inst* 2004; 18: 250-4.
17. Chagani H, Aziz KU. Clinical profile of acute Rheumatic fever in Pakistan A prospective study. *Pak Paed Cardiol J* 2001; 3: 10-9.
18. Dajani AS, Ayoub E, Bierman FZ, Bisno AL, Denny FW, Dureck DT, et al. Special writing group of the committee on Rh fever, endocarditis and Kawasaki disease of the council of cardiovascular disease in the young of the American Heart Association. Guidelines for the diagnosis of rheumatic fever: Jones criteria: 1992 update. *J Am Med Assoc* 1992; 268: 2069-73.
19. Akhtar N, Sadiq M, Chagani H, Hafeez A, Rizvi FH, Mehboob M. Guidelines for prevention of rheumatic fever and rheumatic heart disease. *Pak J Cardiol* 2004; 15: 136-48.
20. Naim M. Rheumatic fever and RHD at the department of child health, school of medicine, University of North Sumatera/Dr Pirngadi hospital, Medan. *Paediatrica Indonesiana* 1989; 29: 64-71.
21. Bassili A, Zahers R, Fattah MA. Profile of secondary prophylaxis among children with RHD in Alexandria, Egypt. *Eastern Mediterranean Health J* 2000; 6: 437-46.
22. Sheikh MA. Cardiac Valvular lesions in patients with Rheumatic Heart Disease. *J Pak Inst Med Sci* 2004; 15: 862-5.
23. Khalilullah, Ahmed SA, Badsha S, Khan A, Kiani MA. Rheumatic Heart disease A study of surgically excised cardiac valves and biopsies. *J Coll Physician Surg Pak* 2002; 12: 542-5.
24. Jadoon S, Haider N, Hassan M. Retrospective analysis of 54 patients with acute rheumatic fever. *Pak Paed J* 2003; 27: 118-20.
25. Ravisha MS, Tullur MS, Kamat JR. Rheumatic fever and RHD; clinical profile of 550 cases in India. *Arch Med Res* 2003; 34: 382-7.
26. Cardiological society of India. Non coronary

- cardiac interventions; Second report by the non coronary cardiac interventions registry of India. Cardiological society of India 1997.
27. Robertson KA, Volmink JA, Mayosi BM. Antibiotics for the primary prevention of acute rheumatic fever. *BMC Cardiovasc Disord* 2005; 31-5: 11-12.
28. Talawar S, Rajesh MR, Subramanian A. Mitral valve repair in children with RHD. *J Cardio thoracic Cardiovasc Surg* 2005; 129: 875-9.
29. Nishtar S, Faruqi AMA, Mattu MA, Mohammad KB, Ahmad A. The national Action plan for the prevention and control of non-communicable diseases and health promotion in Pakistan-Cardiovascular disease. *J Pak Med Assoc*, 2004;54(Suppl 3): S 14-25.

**Address for Correspondence:**

**Dr. Mohammad Faheem**  
Cardiology Department,  
Lady Reading Hospital,  
Peshawar – Pakistan.