

# A Hospital Based Study on Clinical Profile in Patients of Rheumatic Heart Disease Attending a Tertiary Care Hospital in Kumaon Region of Uttarakhand.

Abhishek Rastogi<sup>1</sup>, Yatendra Singh<sup>2</sup>, Arun Joshi<sup>3</sup>

<sup>1</sup>PG 3 Department of Medicine, GMC, Haldwani, India.

<sup>2</sup>Assistant Professor, Department of Medicine, GMC, Haldwani, India.

<sup>3</sup>Professor, Department of Medicine, GMC, Haldwani, India.

## ABSTRACT

**Background:** A thorough understanding of the Rheumatic Heart disease is important to aid in the management of patients with RHD. We hereby thus study various presentations, distributions, clinical profile of various types of valvular involvement in patients with RHD, complications of RHD such as heart failure, arrhythmias, chamber dilation, thromboembolic manifestation, pulmonary hypertension etc. **Methods:** Total 100 patients of age more than 12 years with Rheumatic heart disease attending medicine and cardiology department were enrolled and studied for demographic details, clinical presentation and complications. **Results:** Most common age of presentation of valvular heart disease was 21-30 years (41%) with females (57%) preponderance. Mitral valve involvement was the most common (72%), while tricuspid & pulmonary valve involvements were rare. Mitral stenosis (33%) was the most common valvular lesion followed by mitral stenosis with mitral regurgitation. **Conclusion:** Each valvular lesion in Rheumatic heart disease presented with varied demographic characteristics with peculiar clinical presentation and complication rate.

**Keywords:** RHD, valvular, mitral stenosis.

## INTRODUCTION

Rheumatic heart disease (RHD) is a major cardiac problem worldwide. Though Rheumatic fever and Rheumatic heart disease have decreased in developed countries, it's still very common in India and many developing countries with its most devastating effects on children and young adults in their most productive years. Rheumatic heart disease is the most serious complication of rheumatic fever.<sup>[1]</sup> As many as 39% of patients with acute rheumatic fever may develop varying degrees of pancarditis with associated valve insufficiency, heart failure, pericarditis, and even death. With chronic rheumatic heart disease, patients develop valve stenosis with varying degrees of regurgitation, atrial dilation, arrhythmias, and ventricular dysfunction.<sup>[2]</sup> A better understanding of the natural history coupled with the major advances in diagnostic imaging, interventional cardiology, and surgical approaches have resulted in accurate diagnosis and appropriate selection of patients for therapeutic interventions.

### Name & Address of Corresponding Author

Dr Abhishek Rastogi  
Post Graduate,  
Dept of Medicine,  
GMC,  
Haldwani, India.  
E mail: abhi.rke21005@gmail.com

Till now there is paucity of study on RHD in Kumaon region of Uttarakhand, we hereby thus study various presentations, distributions, complications, prevalence and clinical profile of patients presenting with Rheumatic heart disease in this region. Prevention of Rheumatic fever morbidity depends on secondary prophylaxis, which cannot reduce the

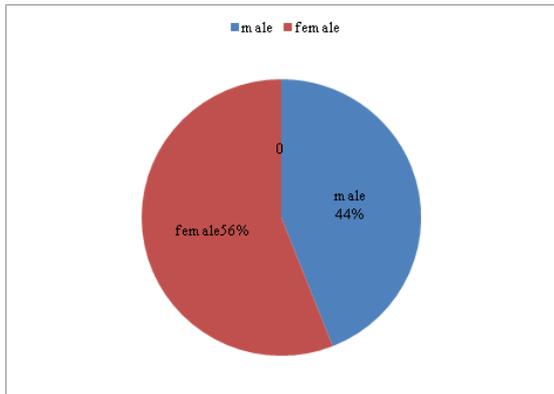
burden of diseases. Primary prophylaxis is not feasible in the absence of a suitable vaccine. An attempt to design an anti-streptococcal vaccine utilizing the M-protein has not succeeded in the last 40 years. Besides pathogenesis, many other questions remain unanswered

## MATERIALS AND METHODS

We enrolled 100 cases of Rheumatic heart disease patients in the present study. Patients of age > 12 years with valvular heart disease and previous documented history of rheumatic fever; Patients of valvular heart disease with investigatory documentation of rheumatic heart disease attending the medicine and Cardiology OPD & IPD from October 2013 to July 2015 were included. All the 100 patients were first clinically evaluated as per case proforma, then undergone serial relevant investigation. Echocardiography (2D, M-MODE) was done in our cardiology department by Hewlett Packard Sonos 1000 echocardiography and colour Doppler machine. All accumulated data was analysed by the help of IBM SPSS statistics developer software version 21. A chest x ray postero anterior view was done in all patients and Cardio thoracic ratio was noted in all patients. A 12-lead electrocardiogram was done in all the patients to look for rate, rhythm, chamber enlargement / hypertrophy. Each patient underwent echocardiographic evaluation and parameters like Left atrial (LA) dimensions, left ventricular ejection fraction (LVEF), left ventricular end diastolic dimension (LVIDD), left ventricular end systolic dimension (LVIDS), valve area for stenotic lesions, pulmonary artery pressure (PASP), for stenotic lesions mean gradient was calculated, and for regurgitate lesions Vena contracta and jet width was calculated.

**RESULTS**

Among the 100 patients studied 44 (44%) were males and 56(56%) were females, female: male ratio being 1.27: 1 [Figure 1].



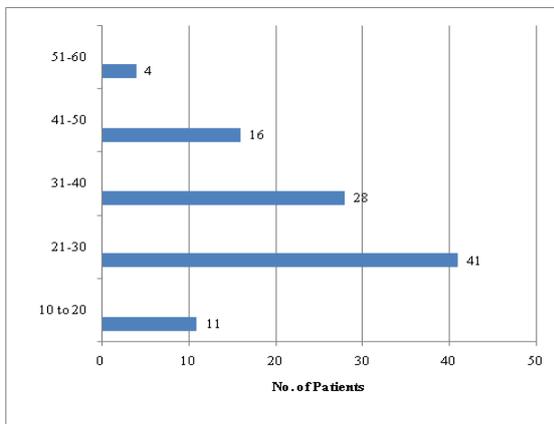
**Figure 1:** Pie chart showing sex distribution of patients (n=100).

As Uttarakhand has a diverse geographical profile. Hence we also analyzed the patients on basis of hilly and terai region. 40 patients (40%) came from hilly area while 60 patients (60%) were from terai region [Table 1].

**Table 1:** Showing Demographic Distribution of Patient

Population	Male	Female	Total
Plain / terai	25	35	60
Hilly	19	21	40
Total	44	56	100

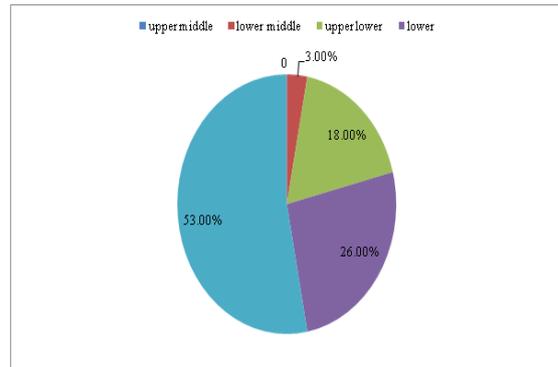
The mean age of the patients was 27.25 ± 7.75 years. Mean age of male patients was 29.07 ± 8.02 years and mean age of female patients was 25.87 ± 7.46 years. Females were slightly younger than males. Maximum number of patients belonged to 21-30 years age group [Figure 2].



**Figure 2:** Showing most common age group at presentation.

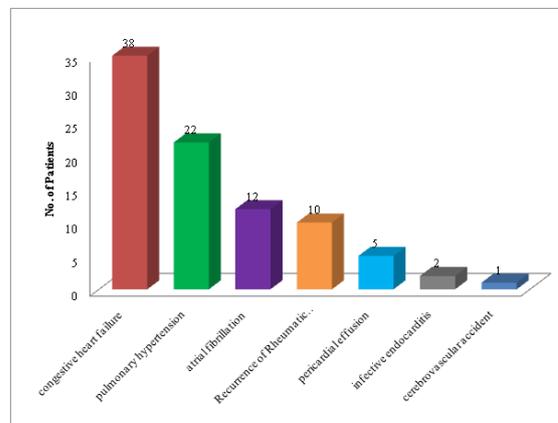
On analysing the patients on basis of socioeconomic status (Kuppuswami classification) mostly, the patients of RHD belonged to lower class 53 patients

(53%), upper lower class 26 patients (26%), lower middle class 18 patients (18%), upper middle class 3 patients (3%) and none to upper class. [Figure 3].



**Figure 3:** Pie diagram showing distribution of patients in socio-economic class(n=100).

There are many ways in which RHD patients can present clinically. Most common mode of presentation was heart failure which was present in 38 patients (38%), 2<sup>nd</sup> most common presentation was pulmonary hypertension (22 patients, 22%), atrial fibrillation in 12 patients (12%), recurrence of rheumatic fever present in 10 patients (10%), pericardial effusion was presents in 5 patients (5%), infective endocarditis in 2 patients (2%), cardio-embolic stroke in 1 patient (1%) [Figure 4].



**Figure 4:** Bar diagram-showing mode of presentation of RHD in study population.

When we analysed valvular involvement in study population, out of 100 patients studied Mitral valve involvement (isolated or in combination) was present in 96 patients (96%). 42 out of 44 (95.45%) males and 54 out of 56 (96.42%) females had mitral valve involvement isolated or in combination with aortic valve involvement. While the aortic valve was affected in 17 (17%) patients, among them there were 11 males and 6 females; isolated or in combination. Out of 100 cases isolated mitral valve involvement was seen in 83 (83%). Most common type of mitral valve involvement was isolated Mitral stenosis (MS), which was seen in 33 patients (33%

of total study population). Among them 15 (15%) were males and 18 (18%) were females (Male = 55.76 %, female= 59.57 %). Isolated Mitral regurgitation (MR) was seen in 22 patients (22% of total study population). Among them 6 were male (6%) and 16 (16%) were female. Combination of Mitral stenosis with Mitral regurgitation was found in 28 (28% of total study population) patients. Among them 12(12%) were males and 16 (16%) were females [Table 2].

**Table 2:** Showing distribution of valvular involvement in study population.

Valvular involvement	Male	Female	Total (%)
Isolated MS	15	18	33(33%)
MS with MR	12	16	28(28%)
Isolated MR	6	16	22(23%)
Isolated AR	2	2	4(4%)
AR with MR	3	3	6(9%)
AR with MS	2	0	2(2%)
MR with MS with AR	4	1	5(1%)
Total	44	56	100

When we analysed the presenting symptoms, most common presenting symptom was dyspnea i.e. 72 (72%) patients. According to the NYHA functional grading of dyspnea 12 (12%) had NYHA grade I, 35 (35%) had grade II, and 15 (15%) had grade III and 10 (10%) had grade IV symptoms. Second most common cardiac manifestation among the study population was palpitation 63 patients (63%). Fatigue was present in 48(48%) & chest pain in 30 patients (30%). Edema was present in 18 patients (18%) [Table 3].

**Table 3:** Showing prevalence of cardiac symptoms among the study population(n=100).

	Cardiac Symptoms	No. of Patients
1.	Dyspnea	72
2.	Palpitations	63
3.	Fatigue	48
4.	Chest pain	30
5.	Edema	18

Among the various complications of the Rheumatic Heart Disease, pulmonary hypertension was present in 22 of patients (22%), mostly in elder patients; while 38 patients (38%) developed congestive cardiac failure, 12 patients (12%) had atrial fibrillation, 2 patients (2%) had infective endocarditis and only 1 patient (1%) had cardio embolic stroke. When we enquired about penicillin prophylaxis regular Benzathine penicillin prophylaxis was received by 12 patients (12%), whereas another 32 patients (32%) took the injections in an irregular manner and the rest 56 patients (56%) didn't receive any penicillin prophylaxis.

## DISCUSSION

Rheumatic heart disease (RHD) has virtually disappeared from the Western world; however, it continues to be a public health problem in India and several other developing countries. It is a disease of poverty and is associated with overcrowding, poor living conditions, poor sanitation and inadequate access to healthcare. The disease affects children and young adolescents causing progressive damage to cardiac valves. According to the World Health Organization (WHO), rheumatic fever (RF)/RHD affects about 15.6 million people worldwide, with 282, 000 new cases and 233, 000 deaths each year.<sup>[1]</sup>

In our study, mean age of the patients was 27.41±3.58 years. The mean age of patients in a study done in Pakistan by Mohammad Faheem et al<sup>[4]</sup> was 22±6 years which was similar to our findings. In our study most of the patients (79 patients, 79%) belonged to lower & upper lower class, which was similar to studies by Arora R. et al in New Dehi<sup>[5]</sup> & Khatoun M. et al in Bangladesh.<sup>[6]</sup> This can be explained by presence of most of risk factors in poor families such as overcrowding, inter-current infection, protein energy malnutrition, & poor awareness about the disease. Our study also showed that most of patients (60 patients, 60%) were from plain/ terai areas, which was similar to the work of Joseph N. et al<sup>[7]</sup> which showed 76.3% urban patients & only 23.7% patients from rural areas, but was different from work of Radwan A. et al.<sup>[7]</sup>

In our study proportion of female patients was higher than males, female: male =1.27:1, Mohammad Faheem et al<sup>[4]</sup> and Radwan A. et al<sup>[8]</sup> showed female: male ratio 1.39:1 & 1.3:1 among RHD patients, but many studies like Joseph N. et al<sup>[7]</sup> showed higher male prevalence too. The lower coverage of female patients may be due to the fact that in most socioeconomically backward regions of the country, hospitals or health care facilities are less frequently availed by females; principally due to comparative ignorance in their part, reluctance among their family members to make any expenditure on their health.

Among the cardiac valvular lesions, mitral valve was found to be the most commonly affected (96 patients, 96%), this was consistent with most other studies.<sup>[8-10]</sup> Rayamajhi et al<sup>[10]</sup> showed 82% patient had mitral valve involvement, Akinwusi OP. et al<sup>[11]</sup> showed 90.9% of patients having mitral valve involvement, total aortic valve involvement (isolated & in combination with mitral & other valves) was present in 17 %(n=17), this was less than that shown by Akinwusi OP. et al<sup>[11]</sup> showing 36.4% aortic valve involvement.

The most common valvular pattern was isolated mitral stenosis, 33 patients (33%) the 2<sup>nd</sup> most common was mitral stenosis with mitral regurgitation 28 patients (28%) followed by isolated

mitral regurgitation 22 patients (22%). These results were similar to study done by Sheikh MA. et al<sup>[12]</sup> showing Forty-eight (48%) patients having predominant mitral stenosis. Khalilullah, Ahmed SA et al<sup>[13]</sup> also showed mitral stenosis either isolated (49.2%) or combined (31.0%) as most common presentation. Majumder AA et al<sup>[14]</sup> also found Mitral stenosis (33.80%) as the commonest lesion among Seven hundred and twenty two cardiac cases admitted at Dhaka Medical College Hospital. Similarly most common lesion was MS in studies done by Mohammad Faheem et al<sup>[4]</sup> (33.98%) and Abrar A et al<sup>[15]</sup> (89.9%). F. Ogah OS. et al<sup>[16]</sup> Rheumatic valve disease in Abeokuta which showed Mitral regurgitation was the most common lesion (63.6%) . Other common lesions mixed mitral valve disease (6.5%), and mixed mitral and aortic regurgitation (5.6%). While study done by Khatoun M. et al<sup>[6]</sup> in Bangladesh showed mitral regurgitation with mitral stenosis as most common lesion(35%).

Most common presenting symptom of the RHD patients in the present study was dyspnoea, which was present in 72 patients (72%), this was similar to that shown by other studies, 75% of patients had dyspnoea in study by Zhang W. et al<sup>[19]</sup> and 77.3% in study by Thakur JS. et al.<sup>[17]</sup> Grades of dyspnoea among total patients in this study as follows: class I = 12 patients (12%), class II = 35 patients (35%), class III =15 patients (15%), class IV=10 patients (10%) this was similar to findings of study by Thakur JS. et al<sup>[17]</sup> showing: class I=38.2%, class II=38.2%, class III=20.6%, class IV=2.9%. Next most common symptom was palpitation present in 63 patients (63%) in this study. Whereas studies by Thakur JS. et al<sup>[17]</sup> & Zhang W. et al<sup>[19]</sup> showed 34.1% & 95.4% patients having palpitation respectively. Other symptoms like edema in 18 patients (18%) similar to that shown by Zhang W. et al<sup>[19]</sup> showing 14.6%, fatigue in 48 patients (48%) similar to that shown in study by Ogah OS. et al<sup>[16]</sup> showing 50.4%, chest pain in 30 patients (30%) much lesser than that shown by Zhang W. et al showing 76.4%. The most common mode of presentation was heart failure. It was present in 38 patients (38%) which is similar to findings of Radwan A. et al<sup>[8]</sup> showing 31.1% & 36.54% in the study by Ravisha MS. et al.<sup>[9]</sup>

Atrial fibrillation was present in 12 patients (12%), which was similar to the other studies, 15.9%, 22.2%, 27.3% atrial fibrillation in studies by Ogah OS. et al<sup>[16]</sup>, Radwan A. et al<sup>[8]</sup> & Akinwusi OP. et al<sup>[11]</sup> respectively. In our study patients had recurrence of rheumatic fever was present in 10 patients (10%) in this study, which varied among studies, 4.3% in study by Radwan A. et al<sup>[8]</sup>, 9.6% in study by Melka et al<sup>[18]</sup> & 40.7% in study by Ravisha MS. et al<sup>[9]</sup>. In our study, this was seen that recurrence of rheumatic fever was significantly higher among who was receiving irregular or no

prophylaxis than in those receiving regular prophylaxis. Infective endocarditis was present in 2 patients (2%) in present study, lower than other studies, 4.6%, 5.54% respectively in studies by Radwan A. et al<sup>[8]</sup> & Akinwusi OP et al<sup>[11]</sup>.

Pericardial effusion was present 5 patients (5%) in this study lower than that in studies by Bitar FF. et al<sup>[19]</sup> and Rayamajhi et al<sup>[10]</sup> finding 11% and 22% pericardial effusion respectively. Stroke was present in 0.98% in the present study slightly lower than that found in study by Ogah OS. et al<sup>[16]</sup> where 2.8% patients had stroke & much lower than that present in study by Akinwusi OP. et al<sup>[11]</sup> where 18.2% patients had stroke. The higher occurrence of complications in our study may be due the fact that this study included only those patients who were above 12 yrs of age & not the younger patients, & overall complications were expected to be high in this particular age group due to temporal delay in development of complication in RHD patients. In our study, 12 patients (12%) received regular prophylaxis which was lower than the study by Thakur JS. et al<sup>[17]</sup> where 61.4% patients were receiving regular prophylaxis, in study by Ravisha MS. et al<sup>[9]</sup> 42.18% were found to be receiving regular prophylaxis.

## CONCLUSION

The prevalence of Rheumatic Heart Disease is still quite common in the Kumaon region of Uttarakhand. Most common age of presentation of valvular heart disease was 21-30 years. Females were more affected with rheumatic valvular heart disease than males. Majority of the patients in our study belonged to lower socioeconomic status. Most of the patients were from the plain / terai region. Mitral valve involvement was the most common (96 patients, 96%), while tricuspid & pulmonary valve involvement were not found in this study. The analysis of our study gives us an insight into the various types of presentation of acquired valvular heart disease and to increase awareness besides early detection of valvular diseases clinically. It also helps in the planning of early treatment of rheumatic heart disease thus decreasing mortality and morbidity of acquired valvular disease. Demographic profile reveals that it is still prevalent in plain / terai areas & low socio-economic class & non compliance to penicillin prophylaxis is a major precipitating factor besides poor hygiene, overcrowding & poor nutritional status. Hence, some relatively simple measures like adherence to regular penicillin prophylaxis, improvement of hygiene and nutritional status, early medical aid in all diagnosed cases of RHD and rheumatic fever will significantly reduce the morbidity and mortality in this condition.

**REFERENCES**

1. Carapetis J. Rheumatic heart disease in developing countries [comment]. *N Engl J Med.* 357: 439–441, 2007.
2. Prevalence of rheumatic fever and rheumatic heart disease in school children: Multicenter study. Annual Report. New Delhi: Indian Council of Medical Research;1977: 108.
3. Rheumatic fever and rheumatic heart disease. Report of WHO Expert consultation. October 1, 2001. World Health Organization Geneva: Geneva, 2004.
4. Mohammad Faheem, Mohammad Hafizullah, Adnan Gul, Hikmatullah Jan, Mohammad Asghar Khan Department of Cardiology, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar, Pakistan *jpmi* 2007; 21(02) 99-103.
5. Arora R, Subramanyam G, Khalilullah M, Gupta MP. Clinical profile of rheumatic fever and rheumatic heart disease: A study of 2, 500 cases. *Indian Heart J.* 1981;33: 264–9.
6. Khatoun M. Clinical profile of rheumatic fever in some hospitalized children of Bangladesh. *Bangladesh Med Res Counc Bull.* 1985;11: 33–8.
7. Nitin Joseph, Deepak Madi, Ganesh S Kumar, Maria Nelliyanil, Vittal Saralaya, and Sharada Rai. *N Am J Med Sci.* 2013; 5(11): 647–652.
8. Radwan A, Bajjey M. Spotlight on Current Clinical Profile of Rheumatic Heart Diseases (RHD) and Rheumatic Fever (RF) in Sohag University Hospital (Upper Egypt), 2011. Jan 18.
9. Ravisha MS, Tullu MS, Kamat JR. Rheumatic fever and rheumatic heart disease: Clinical profile of 550 cases in India. *Arch Med Res.* 2003;34: 382–7.
10. Rayamajhi A, Sharma D, Shakya U. Clinical, laboratory and echocardiographic profile of acute rheumatic fever in Nepali children. *Ann Trop Paediatr.* 2007;27: 169–77.
11. Ozer S, Hallioglu O, Ozkutlu S, Celiker A, Alehan D, Karagoz T. Childhood acute rheumatic fever in Ankara, Turkey. *Turk J Pediatr.* 2005;47: 120–4.
12. Sheikh MA. Cardiac Valvular lesions in patients with Rheumatic Heart Disease. *J Pak Inst Med Sci.* 2004; 15: 862-5.
13. 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.
14. Majumder AA. Echocardiographic pattern of rheumatic valvular disease. An experience at Dhaka Medical College. *Pak Heart J.* 2002;29: 3-4.
15. Abrar A, Khan S, Rehman MU, Jan T, Faisal M, Khan N. Frequency of rheumatic heart disease in patients undergoing echocardiography in district Dera Ismail Khan. *J Med Sci.* 2014; 12: 147-50.
16. Okechukwu S, Ogah, Gail D, Adegbite1, Sunday B, Udoh1, Elisha I, Ogbodo, FisayoOgah, Adesemowo, Oluwatoyin Ogunkunle, Ayodele O. Falase Chronic rheumatic heart disease in Abeokuta, Nigeria: Data from the Abeokuta heart disease registry.
17. Thakur JS, Negi PC, Ahluwalia SK, Vaidya NK. Epidemiological survey of rheumatic heart disease among school children in the Shimla Hills of northern India: Prevalence and risk factors. *J Epidemiol Community Health.* 1996; 50: 62–7.
18. Melka A. Rheumatic heart disease in Gondar college of medical sciences teaching hospital: socio-demographic and clinical profile. *Ethiop Med J.* 1996;34: 207–16.
19. Zhang W1, Mondo C, Okello E, Musoke C, Kakande B, Nyakoojo W, Kayima J, Freers J. Presenting features of newly diagnosed rheumatic heart disease patients in Mulago Hospital: a pilot study. *Cardiovasc J Afr.* 2013; 24(2): 28-33.

**How to cite this article:** Rastogi A, Singh Y, Joshi A. A Hospital Based Study on Clinical Profile in Patients of Rheumatic Heart Disease Attending a Tertiary Care Hospital in Kumaon Region of Uttarakhand. *Ann. Int. Med. Den. Res.* 2016;2(3):154-58.

**Source of Support:** Nil, **Conflict of Interest:** None declared