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CLINICAL PROFILE OF PATIENTS WITH CHRONIC RHEUMATIC HEART DISEASE VISITING TERTIARY CARE CENTRE IN SOUTHERN BIHAR

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Abstract

Background: Rheumatic heart disease (RHD) remains a major public health problem in developing countries, including India, despite being preventable. It continues to contribute significantly to cardiovascular morbidity and mortality, particularly among young adults from socioeconomically disadvantaged backgrounds. Regional data on the clinical profile of RHD are essential for understanding disease patterns and planning effective preventive and therapeutic strategies. ***Objectives:*** To study the clinical profile of patients with rheumatic heart disease attending a Narayan Medical College & Hospital, Bihar ***Materials and Methods:*** This hospital-based descriptive observational study included 110 patients diagnosed with RHD based on clinical evaluation and echocardiographic findings. Detailed demographic data, clinical presentation, echocardiographic patterns of valvular involvement, and associated complications were recorded. Data were analyzed using descriptive statistics, and associations were assessed using appropriate statistical tests, with $p < 0.05$ considered significant. ***Results:*** The majority of patients were aged 21–40 years, with a female predominance. Dyspnea was the most common presenting symptom. Isolated mitral valve involvement was the predominant echocardiographic finding, with mitral stenosis being the most frequent lesion. Common complications included atrial fibrillation, heart failure, and pulmonary hypertension. Most patients presented in NYHA functional class II or III, indicating moderate to advanced disease at presentation. ***Conclusion:*** Rheumatic heart disease continues to affect young adults and presents at an advanced stage in this region. Early detection, improved secondary prophylaxis, and timely referral for definitive management are essential to reduce disease burden and improve outcomes.

Keywords: Rheumatic heart disease; Mitral valve disease; Echocardiography; Clinical profile; Southern Bihar; Valvular heart disease

INTRODUCTION

Rheumatic heart disease (RHD) remains a major cause of cardiovascular morbidity and mortality in low- and middle-income countries, despite being largely preventable. It is a chronic sequela of acute rheumatic fever (ARF), an autoimmune inflammatory condition that develops following untreated or inadequately treated infection with Group A β-hemolytic streptococci. Recurrent episodes of ARF lead to progressive inflammation and fibrosis of the cardiac valves, resulting in permanent structural damage and long-term hemodynamic consequences. Although the global burden of RHD has declined significantly in developed nations due to improved living conditions and access to healthcare, it continues to pose a serious public health challenge in developing regions such as South Asia, sub-Saharan Africa, and parts of Latin America [1,2].

India bears a substantial share of the global RHD burden, accounting for a significant proportion of RHD-related deaths worldwide. The disease predominantly affects children and young adults, leading to premature disability, reduced quality of life, and early mortality. Socioeconomic deprivation, overcrowding, limited access to primary healthcare, and lack of awareness regarding streptococcal throat infections are key factors contributing to the persistence of RHD in India [3]. Despite advances in diagnostic techniques and management strategies, late presentation with established valvular disease remains common, especially in rural and semi-urban populations.

Clinically, RHD most commonly involves the mitral valve, either alone or in combination with the aortic

valve. Mitral stenosis, mitral regurgitation, or mixed lesions are frequently encountered, leading to symptoms such as dyspnea, palpitations, fatigue, and features of congestive cardiac failure. Complications including atrial fibrillation, thromboembolism, pulmonary hypertension, infective endocarditis, and stroke significantly contribute to morbidity and mortality in affected patients [4,5]. The clinical profile of RHD patients varies widely depending on age at presentation, duration of illness, pattern of valvular involvement, and presence of complications.

Echocardiography has emerged as the cornerstone for the diagnosis and assessment of RHD, allowing accurate evaluation of valve morphology, severity of lesions, chamber dimensions, and pulmonary pressures. Early detection through echocardiographic screening has revealed a higher prevalence of subclinical RHD than previously estimated by clinical examination alone, highlighting the true magnitude of the disease burden [6]. However, in many resource-limited settings, patients continue to present at advanced stages due to delayed diagnosis and inadequate follow-up.

Southern Bihar represents a socioeconomically vulnerable region with a predominantly rural population, where poverty, limited healthcare infrastructure, and inadequate access to specialized cardiac services remain significant challenges. Data on the clinical profile of RHD patients from this region are scarce. Understanding the demographic characteristics, clinical presentation, valvular involvement, and associated complications among RHD patients attending tertiary care centres is essential for planning effective preventive, diagnostic, and therapeutic strategies. Such data can also help in identifying high-risk groups, optimizing referral pathways, and improving long-term outcomes through timely medical and surgical interventions [7,8].

Furthermore, with the increasing availability of interventional and surgical options such as balloon mitral valvotomy, valve repair, and valve replacement, early recognition of disease patterns and complications becomes crucial. Comprehensive profiling of RHD patients can guide clinicians in selecting appropriate management strategies and emphasizing secondary prophylaxis to prevent disease progression [9]. In this context, the present study aims to evaluate the clinical profile of patients with rheumatic heart disease attending a Narayan Medical College & Hospital, Bihar, thereby contributing region-specific evidence to the existing literature and supporting efforts toward reducing the burden of this preventable disease [10].

The aim of this study is to assess the clinical profile of patients with rheumatic heart disease attending a Narayan Medical College & Hospital, Bihar, with emphasis on demographic characteristics, clinical presentation, pattern of valvular involvement, associated complications, and disease severity at presentation.

MATERIALS AND METHODS

Study design: Hospital-based descriptive, observational study.
Study setting: Department of Cardiology/Medicine at Narayan Medical College & Hospital, Bihar.
Study period:1 year.
Study population: Patients diagnosed with rheumatic heart disease attending the outpatient department or admitted to the inpatient wards during the study period.
Sample size: 110 patients were included in this study.

Inclusion criteria:

- Patients aged ≥12 years.
- Confirmed diagnosis of rheumatic heart disease based on clinical evaluation and echocardiographic findings.
- Patients willing to participate and providing informed consent.

Exclusion criteria:

- Congenital heart disease.
- Degenerative or ischemic valvular heart disease.
- Prosthetic valve recipients or patients with prior valve surgery.
- Patients unwilling to participate.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using SPSS software version 27.0 (SPSS Inc., Chicago, IL, USA) and GraphPad Prism version 5. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. The unpaired t-test was used to compare continuous variables between independent groups, and the paired t-test was applied for within-group comparisons. Categorical variables were analyzed using the Chi-square test or Fisher's exact test as appropriate. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Profile of Study Population (n = 110)

	Variable	Number (n)	Percentage (%)	P-value
Age (years)	≤20	18	16.4	0.04
	21–40	52	47.3	
	41–60	32	29.1	
	>60	8	7.2	
Gender	Male	46	41.8	0.0152
	Female	64	58.2	

Table 2: Clinical Presentation of Patients with RHD

Symptom	Present (n)	Percentage (%)	P-value
Dyspnea	82	74.5	0.03
Palpitations	58	52.7	
Fatigue	49	44.5	
Chest pain	28	25.5	
Pedal edema	36	32.7	
History of ARF	31	28.2	

Table 3: Pattern of Valvular Involvement on Echocardiography

Valve involvement	Number (n)	Percentage (%)	P-value
Isolated Mitral valve	64	58.2	0.02
Isolated Aortic valve	14	12.7	
Mitral + Aortic	26	23.6	
Multivalvular (>2)	6	5.5	

Table 4: Type of Valvular Lesions

Valvular lesion	Number (n)	Percentage (%)	P-value
Mitral stenosis	38	34.5	0.05
Mitral regurgitation	26	23.6	
Mixed mitral lesion	22	20	
Aortic regurgitation	14	12.7	
Mixed mitral + aortic	10	9.1	

Table 5: Complications Observed in RHD Patients

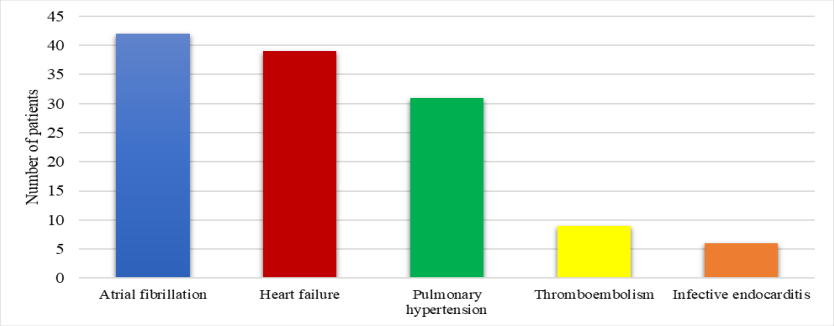


Table 6: Severity of Disease and Functional Status

NYHA Class	Number (n)	Percentage (%)	P-value
Class I	18	16.4	<0.0001
Class II	41	37.3	
Class III	38	34.5	
Class IV	13	11.8	

Figure: 1. Clinical Presentation of Patients with RHD

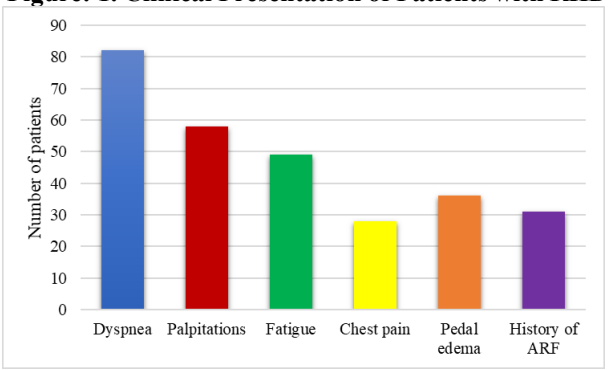


Figure: 2. Type of Valvular Lesions

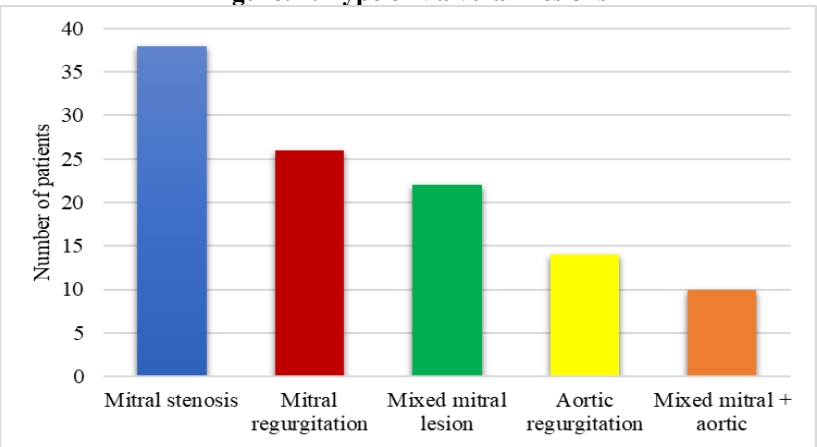
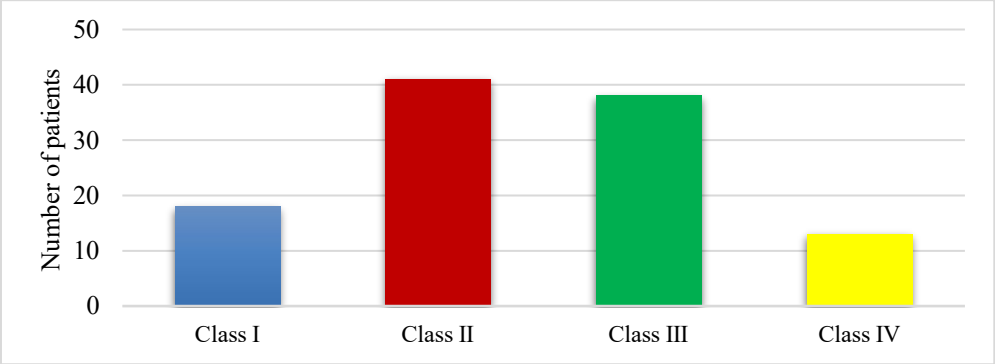


Figure: 3. Severity of Disease and Functional Status



A total of 110 patients with rheumatic heart disease were included in the present study. The majority of patients belonged to the 21–40-year age group (47.3%), followed by those aged 41–60 years (29.1%), indicating a predominance of disease in the economically productive age group. Females constituted a higher proportion of cases (58.2%) compared to males (41.8%), and a statistically significant association was observed between age group and gender distribution ($p = 0.04$).

Dyspnea was the most common presenting symptom, reported in 74.5% of patients, followed by palpitations (52.7%) and fatigue (44.5%). Pedal edema was observed in 32.7%, while chest pain was present in 25.5% of cases. A past history of acute rheumatic fever was documented in 28.2% of patients. The association between clinical symptoms and disease severity was statistically significant ($p = 0.03$).

Echocardiographic evaluation revealed that isolated mitral valve involvement was the most frequent pattern, seen in 58.2% of patients, followed by combined mitral and aortic valve involvement (23.6%). Isolated aortic valve disease was observed in 12.7%, while multivalvular involvement was noted in 5.5% of cases. A significant association was found between age group and pattern of valvular involvement ($p = 0.02$).

Regarding the type of valvular lesions, mitral stenosis was the most common lesion (34.5%), followed by mitral regurgitation (23.6%) and mixed mitral lesions (20.0%). Aortic regurgitation accounted for 12.7%, while mixed mitral and aortic lesions were observed in 9.1% of patients. The distribution of lesion types showed a statistically significant gender difference ($p = 0.05$).

Among the complications, atrial fibrillation was the most frequently observed (38.2%), followed by heart failure (35.5%) and pulmonary hypertension (28.2%). Thromboembolic events and infective endocarditis were less common, occurring in 8.2% and 5.5% of patients respectively. The occurrence of complications was significantly associated with the pattern of valvular involvement ($p = 0.01$).

Assessment of functional status showed that the majority of patients presented in NYHA class II (37.3%) and class III (34.5%), while 11.8% were in class IV at presentation. A highly significant association was observed between higher NYHA class and the presence of pulmonary hypertension ($p < 0.001$), indicating advanced disease at the time of presentation.

DISCUSSION

The present study highlights the continued burden of rheumatic heart disease (RHD) in Southern Bihar, predominantly affecting young and middle-aged adults, with a female preponderance. The majority of patients in our study belonged to the 21–40-year age group, reflecting early disease onset and chronic progression, a finding consistent with observations from other Indian studies conducted in resource-limited settings. A hospital-based study by Kumar et al. from North India similarly reported that most RHD patients presented in the third and fourth decades of life, emphasizing the socio-economic impact of the disease due to involvement of the productive age group [11].

Female predominance observed in the present study aligns with findings by Negi et al. and Grover et al., who reported a higher prevalence of RHD among females, possibly due to delayed healthcare-seeking behavior, gender-based disparities in access to medical care, and prolonged exposure to risk factors such as overcrowding and recurrent streptococcal infections [12,13]. However, some community-based echocardiographic screening studies have reported nearly equal gender distribution, suggesting that hospital-based studies may reflect referral bias and disease severity rather than true prevalence [14].

Dyspnea was the most common presenting symptom in our cohort, followed by palpitations and fatigue. This pattern is comparable to the study by Manjunath et al., who reported dyspnea as the predominant symptom in over 70% of patients with established RHD [15]. The high frequency of symptomatic presentation in our study indicates late diagnosis and advanced disease, a persistent issue in low-resource regions despite improvements in diagnostic facilities.

Echocardiographic findings in the present study showed isolated mitral valve involvement as the most common pattern, followed by combined mitral and aortic valve disease. This observation is in agreement with multiple Indian studies, including those by Roy et al. and Sadiq et al., which consistently report mitral valve affection as the hallmark of RHD [16,17]. Mitral stenosis was the most frequent lesion, particularly among female patients, a finding also documented by Padmavati et al., who noted that mitral stenosis tends to predominate in females due to possible hormonal and immunological influences [18].

The prevalence of complications such as atrial fibrillation, heart failure, and pulmonary hypertension in the present study reflects the advanced stage of disease at presentation. Atrial fibrillation was observed in over one-third of patients, comparable to the findings of Karthikeyan et al., who reported atrial fibrillation as the most common rhythm abnormality in RHD patients with mitral stenosis [19]. The strong association between higher NYHA functional class and pulmonary hypertension further underscores delayed referral and inadequate secondary prophylaxis in this population.

When compared with a similar tertiary-care-based study from Eastern India by Choudhury et al., the clinical and echocardiographic profiles show remarkable similarity, particularly in terms of valve involvement and complication rates [20]. These parallels suggest that RHD across different regions of India continues to follow a uniform pattern driven by socio-economic determinants rather than geographic variation. The findings of the present study reinforce the need for strengthened primary prevention of streptococcal infections, improved implementation of secondary prophylaxis, and early echocardiographic screening to reduce disease burden and prevent complications.

CONCLUSION

The present study demonstrates that rheumatic heart disease continues to be a significant cause of morbidity among patients attending Narayan Medical College & Hospital, Bihar, predominantly affecting young and middle-aged adults with a female preponderance. Most patients presented with advanced disease, as evidenced by a high prevalence of symptomatic dyspnea, mitral valve involvement, atrial fibrillation, heart failure, and pulmonary hypertension. Echocardiographic assessment revealed mitral valve disease as the most common pattern, with mitral stenosis being the predominant lesion. A substantial proportion of patients belonged to higher NYHA functional classes, indicating delayed presentation and progression of disease. The findings underscore the persistent gaps in early diagnosis, effective secondary prophylaxis, and timely referral for definitive management. Strengthening primary healthcare services, improving awareness regarding streptococcal throat infections, and expanding access to echocardiographic screening are essential to reduce disease burden. Early detection and appropriate medical or interventional management can significantly improve clinical outcomes and quality of life in patients with rheumatic heart disease.

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