

## Original Research Article

# Clinical profile of acute rheumatic fever patients attending a tertiary care hospital in eastern Bihar, India

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## ABSTRACT

**Background:** Acute rheumatic fever (ARF) is a multisystem disease resulting from an autoimmune reaction to infection with group A beta haemolytic streptococcus. Acute rheumatic fever commonly occurs between 5-14 years of age.<sup>1</sup> The major concern relating to acute rheumatic fever is often not the episode itself but the long-term consequences of damage to heart valves (Rheumatic heart disease (RHD) that often results from recurrent episodes of acute rheumatic fever. Rheumatic heart disease (RHD) continues to be a major public health problem and a common cause of morbidity and mortality in many parts of India.<sup>2</sup>

**Methods:** 50 consecutive patients admitted with the diagnosis of acute rheumatic fever in Medicine Department, Katihar Medical College and Hospital, Bihar, India were studied. A detailed clinical history of these patients including presenting symptoms were noted. Physical examination of all systems was done and a diagnosis of acute rheumatic fever was made according to WHO Criteria (2002-2003) for the diagnosis of rheumatic fever and rheumatic heart disease (Based on the Revised Jones Criteria). Echocardiography of all 50 patients were done.

**Results:** Mean age of patients diagnosed with ARF was  $14.20 \pm 7.02$  years. Out of 50 patients, 32 (64%) were female and 18 (36%) were male. Joint pain was the commonest presenting complain, 35 (70%) patients, followed by fever in 21 (42%) patients. Among Jones major manifestations 36 (72%) cases had carditis, 32 (64%) had arthritis, 6 (12%) had subcutaneous nodules, 5 (10%) had erythema marginatum and 5 (10%) had Sydenham's chorea. In patients with carditis, 25 (69.44%) had mitral regurgitation (MR) only while 10 (27.77%) had MR with aortic regurgitation (AR) and 1 (2.77%) patient had organic tricuspid regurgitation (TR) with mitral regurgitation and aortic regurgitation. Out of 36 patients with carditis, 10 (27.77%) patients did not have any clinical evidence of carditis and were detected by echocardiography only.

**Conclusions:** Commonest complain in patients with rheumatic fever was joint pain followed by fever. In patients with carditis, all had mitral regurgitation (MR), with 1/3<sup>rd</sup> of these patients having associated aortic regurgitation (AR). 1/3<sup>rd</sup> of patients with carditis were detected by echo only and therefore, echo should be included in diagnostic criteria for acute rheumatic fever. None of the patients who developed rheumatic fever was on penicillin prophylaxis.

**Keywords:** Acute rheumatic fever, Aortic regurgitation, Echocardiography, Mitral regurgitation

## INTRODUCTION

Acute rheumatic fever (ARF) is a multisystem disease resulting from an autoimmune reaction to infection of the upper respiratory tract with group A beta hemolytic

streptococcus. The most widely accepted theory of rheumatic fever pathogenesis is based on the concept of molecular mimicry whereby an immune response targeted at streptococcal antigens (mainly thought to be on the M protein and the N-acetylglucosamine of group

A streptococcal carbohydrate) also recognizes human tissues. Although many parts of the body may be affected, almost all of the manifestations resolve completely. The major exception is cardiac valvular damage (rheumatic heart disease (RHD)), which may persist after the other features have disappeared. Acute rheumatic fever commonly occurs between 5-14 yrs of age.

By contrast, recurrent episodes of ARF remain relatively common in adolescents and young adults. This pattern contrasts with the prevalence of rheumatic heart disease (RHD), which peaks between 25 and 40 yrs. There is no clear gender association for acute rheumatic fever, but RHD more commonly affects females, sometimes upto twice as frequently as males<sup>3</sup>. This prospective observational study was carried out in Department of Medicine, Katihar Medical College and Hospital, Bihar, India to see the clinical profile of rheumatic fever case in this area in modern days.

## METHODS

Fifty consecutive patients admitted with the diagnosis of acute rheumatic fever (ARF) in the Department of Medicine, Katihar Medical College and Hospital, Katihar, Bihar, India from January 2015 to December 2016 were studied. A detailed clinical history of these patients including presenting symptoms, past history of rheumatic fever, penicillin prophylaxis and missing of penicillin injections was taken. Diagnosis of acute rheumatic fever (ARF) was made according to WHO criteria (2002-2003) for the diagnosis of rheumatic fever and rheumatic heart disease (based on the revised Jones criteria) The patients were examined in detail for evidence of subcutaneous nodules, erythema marginatum and abnormal movements i.e. chorea. Detailed cardiovascular examination was done. All patients were subjected for echocardiography.

## RESULTS

Fifty patients were admitted with the diagnosis of ARF for two years: 32 (64%) were female and 18 (36%) were male. 40 (80%) patients presented between September and march and only 10 (20%) patients between April and August. Mean age of the patients presenting with ARF was  $14.20 \pm 7.02$  years. The most common presenting complain of patients of ARF in this study was joint pain, found in 35 (70%) patients followed by fever in 21 (42%) patients. Out of Jones major manifestations, carditis was most common, seen in 36 (72%) patients. 10 (27.77%) of these patients of carditis did not have clinical evidence of carditis and were detected to have cardiac lesion on echocardiography. Out of 35 patients presenting with joint pain, 32 (64%) had evidence of arthritis and 3 (6%) had arthralgia without arthritis. Subcutaneous nodules were found in 6 (12%), while erythema marginatum in 5 (10%) patients. Sydenham's chorea was found in 5 (10%) patients.

All patients of chorea were female and less than 20 years of age. Out of 36 patients with carditis all had evidence of mitral regurgitation. 25 (69.44%) patients had isolated mitral regurgitation (MR), while 10 (27.77%) had mitral regurgitation with aortic regurgitation (AR). Organic tricuspid regurgitation (TR) with mitral regurgitation and aortic regurgitation was found in 1 (2.77%) patient. Pericardial effusion was found in 4 (8%) patients while left ventricular dysfunction was detected in 2 (4%) patients.

**Table 1: Clinical features of the patients (n=50).**

Clinical features	
Mean age	14.20±7.02 years
Male	18 (36%)
Female	32 (64%)
Joint pain	35 (70%)
Fever	21 (42%)
Breathlessness	7 (14%)
Abnormal movements	4 (8%)
Palpitation	6 (12%)
Chest pain	3 (6%)
Abdominal pain	4 (8%)
Epistaxis	3 (6%)

**Table 2: Major manifestations and echocardiographic findings of the patients (n=50).**

Major manifestations and echocardiographic findings	
Carditis	36 (72%)
Arthritis	32 (64%)
Subcutaneous nodules	6 (12%)
Chorea	5 (10%)
Erythema marginatum	5 (10%)
<b>Echocardiographic lesions in carditis (32 patients)</b>	
Isolated MR	25 (69.44%)
MR with AR	10 (27.77%)
MR with AR with organic TR	1 (2.77%)
Pericardial effusion	4 (8%)
LV dysfunction	2 (4%)

## DISCUSSION

The incidence of rheumatic fever has been on the decline in developed countries (less than 5/100000/yr). This decline is largely attributable to improved living conditions-particularly less crowded housing and better hygiene, which resulted in reduced transmission of group A *streptococci*.

The introduction of antibiotics and improved systems of medical care has a supplemental effect. The virtual disappearance of ARF and reduction in the incidence of RHD in industrialized countries unfortunately could not be replicated in developing countries, where these diseases continue unabated. It still remains a major health problem in developing countries (the incidence being 27-100/100000/yr).<sup>3</sup> RHD is the most common cause of

heart disease in children in developing countries and is a major cause of mortality and morbidity in adults as well. The pathogenetic pathway from exposure to group A *streptococcus* followed by pharyngeal infection and subsequent development of ARF, ARF recurrences and development of RHD and its complications is associated with a range of risk factors and therefore, potential interventions at each point. Unfortunately, the greatest burden of disease is found in developing countries, most of which do not have the resources, capacity, and/or interest to tackle this multifactorial disease. The epidemiology of acute rheumatic fever (ARF) is linked with that of group A beta hemolytic *streptococcal* pharyngitis; both have a maximum incidence in the age group of 5-15 years. In India, the average age at presentation has been reported by Padmavati to be between 10 and 14 years.<sup>4</sup>

Study also found average age of acute rheumatic fever in this area of Bihar during this study as 14.2 years. Rheumatic fever is an excellent example of a condition where all three components of the classic epidemiologic triad: agent, host and environment interact to result in the development of the disease. Parts of India that have good human development indices (HDI), such as Kerala, have a much lower incidence of acute rheumatic fever when compared to parts of India with low HDI, such as Chhattisgarh, Orissa, Bihar or West Bengal. This decline in developed states has been attributed to improved nutrition of children and diminished exposure to the infecting organism. Seasonal variation in the incidence of acute rheumatic fever (i.e. High incidence in early autumn, late winter and early spring) closely mimic variations in streptococcal infections in temperate climates. Acute rheumatic fever is considered as a social disease i.e. alteration in socio-economic state of a community will adversely or favorably affect the incidence of this disease. The incidence of ARF fell steeply in USA from 1970 onwards with extensive use of penicillin for prevention. In India, however, primary prevention has hardly been used. Alteration in the virulence of streptococci seems to be a major factor in the decline or resurgence of the disease in last century.<sup>5</sup>

Fourth (80%) out of 50 of the total patients studied in this study presented between September and March, the period when streptococcal sore throat is common. We found caritis in around 36 (72%) patients and arthritis in around 32 (64%) patients. This is similar to Utah outbreak, where caritis was seen in 80% and arthritis in 70%. 10 (27.77%) of our 36 patients with caritis were picked up by echocardiography. The reported incidence of silent carditis varies between 7% and 47%, depending on the phase the disease has reached when the echocardiography is performed.<sup>6</sup> Echocardiography with color Doppler flow is the most sensitive technique for detecting cardiac involvement in acute rheumatic fever.<sup>7</sup> Progressive mitral valve thickening and progressive chordal shortening or a combination of aortic and mitral incompetence with cusp thickening are changes specific

for acute rheumatic fever. Subcutaneous nodules and erythema marginatum are usually present in fewer than 10% of cases in acute rheumatic fever.<sup>8</sup>

In this study subcutaneous nodules were found in 6 (12%) patients of acute rheumatic fever. Similarly, erythema marginatum was detected in 5 (10%) patients of ARF in this study. Sydenham's chorea occurs in less than 10% patients with acute rheumatic fever. Chorea occurs mainly in females and is rare after the age of 20 years. It almost never occurs in post-pubertal males. In this study chorea was present in 5 (10%) patients. All patients with chorea were female and less than 20 years of age. Six patients were earlier diagnosed to have rheumatic fever and were advised prophylaxis. But all six had left prophylaxis for variable period of time; one had missed just the last injection and developed rheumatic fever after missing the injection for 2 weeks. None of the patients who developed rheumatic fever were on regular penicillin prophylaxis.

## CONCLUSION

Acute rheumatic fever (ARF) is more common in females and has got a seasonal variation, which closely mimic variations in streptococcal infections. Joint pain is the commonest presentation of acute rheumatic fever followed by fever. Carditis is the commonest Jones major manifestation followed by arthritis. Subcutaneous nodules and erythema marginatum are not very uncommon, if carefully sought. Sydenham's chorea mainly affects females.

All patients who develop recurrence are off penicillin prophylaxis. Silent valvular involvement occurs in around 1/4th patients with carditis and so echocardiography should be used to diagnose carditis in acute rheumatic fever.

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## REFERENCES

1. Harrison's Principles Of Internal Medicine, 19th edition, Volume 2. Mc Graw Hill Education; 2015.
2. Munjal YP, Sharma SK, Agarwal AK, Singal RK, Gupta P, Sundar S, et al. In: API Textbook Of Medicine; 10<sup>th</sup> ed. Jaypee Brothers Medical Publishers, Volume 1; 2015.
3. Rheumatic fever and rheumatic heart disease, Report of a WHO study group, technical report series, WHO, Geneva. 1988;764:7-11.
4. Padmavati S. Rheumatic fever and rheumatic disease in developing countries. Bull WHO. 1978;56:543.
5. Agarwal BL. Rheumatic fever-Diection and Resurgence. JAPI. 1994;42:820-1.

6. Manson T, Fisher M, Kajula G. Acute rheumatic fever in West Virginia. Not just a disease of children. Arch Intern Med. 1991;151:133-6.
7. Wilson NJ, Neutze JM. Echocardiographic diagnosis of subclinical carditis in acute rheumatic fever. Int J Cardiol. 1995;50:1-6.
8. Kasper DL, Fauci AS, Hauser SL, Longo DL, Jameson JL, Loscalzo J. In: Harrison's Principles of

Internal Medicine, Mc Graw Hill Education, 19th ed; Volume 2; 2015.

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