

# A Comprehensive Study of Rheumatic Fever and Rheumatic Heart Disease Cases in School Children of Tripura, Northeast India

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**Abstract:** ***Introduction:** Rheumatic heart disease is still the commonest valvular heart disease in India, occurring following Rheumatic fever. There is no population based study regarding the prevalence of rheumatic fever/ rheumatic heart disease (RF/RHD) from Tripura. **Methods and results:** A school based survey for prevalence of RF/RHD was done in three districts of Tripura, as well as the OPD/IPD cases attending tertiary hospitals of the state. The subjects suspected to have RF/RHD on clinical ground were subjected to investigations and echocardiography to confirm the diagnosis. Total 2876 subjects were screened in active surveillance and 215 cases from OPD/IPD. 28 cases were found to have RF/RHD. Mitral valve was the commonest to be involved and was given penicillin prophylaxis. Male preponderance was found. **Conclusion:** RF/RHD is declining in Tripura, however many areas of the state need to have active surveillance. Mitral valve is commonest to be involved and prevalence is much more in male than in female.*

**Keywords:** Rheumatic Fever, Rheumatic Heart Disease, Mitral Valve, Active surveillance

## 1. Introduction

Worldwide, in children, adolescents and young adults, rheumatic fever (RF) and rheumatic heart disease (RHD) have cast a menace, more so in developing countries<sup>1</sup>. Not just the acute form of disease is the culprit but also its consequences leading to higher mortality and morbidity in India, in spite of the advancement and progression in medical science<sup>2</sup>. Treatment of valvular pathologies arising from rheumatic heart disease with expensive modalities is another blow to the economy of the country<sup>3</sup>. Jones criteria published in 1944 has given the specific guidelines to the medical fraternity to diagnose such case<sup>4</sup>. Following the Jones criteria and four revisions and modifications<sup>5,6</sup>, however many of the cases are still an ice-berg phenomenon and yet to come into the limelight and remains one of the major causes of cardiovascular disease, accounting for nearly 25-45% of the acquired heart disease. No previous study on acute rheumatic fever and rheumatic heart disease was conducted in the state of Tripura previously and hence this study was the first of its kind in the state, which would throw a light on the disease burden.

## 2. Aim and Objectives

- 1) To find out the prevalence of Rheumatic fever and Rheumatic Heart disease in Tripura through active as well as passive surveillance.
- 2) To study the clinical manifestation of each case.
- 3) To administer prophylactic penicillin

## 3. Materials and Methods

**Type of study:** Cross-sectional Study

**Study Duration:** One year six months from May 2012 to October 2013

**Study Population:** Children of school-going age between age 5 to 15 years.

### Exclusion Criteria

- Children outside the age-group 5 to 15 years
- Those who do not give consent to participate
- Those who were absent and could not be traced on two repeat visits and who were absent due to other illness.

### Sampling

- Three districts of the state were randomly selected. They were Sadar, Bishalgarh and Gomati. 66 schools in these districts were visited and the students were approached to participate in the study. This method was adopted to actively find case in the community (*active surveillance*).
- Those who reported to the OPD/IPD in the stipulated duration were also considered for the study (*passive surveillance*).

### Study Tools

Revised Jones criteria was used to confirm cases of Rheumatic fever. Investigations that were done included the following:

- Total leukocyte count (TLC)
- Erythrocyte Sedimentation Rate (ESR)
- C-Reactive Protein (CRP)
- Anti-Streptolysin O (ASO) Titres
- Chest X-ray
- ECG (Electrocardiography)
- For confirmation of Rheumatic Heart Disease, Doppler Echocardiography was done.
- Twenty Eight (28) Cases were registered and were given patient registration and follow-up card for monitoring of secondary prophylaxis using injectable Benzathine Penicillin according to their weight.

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#### 4. Result

A total of 2876 children were examined in the course of this study comprising of both active surveillance i.e. from school visits and passive surveillance i.e. those who reported at the Paediatrics OPD & IPD of AGMC during the stipulated period of this study. In cases of Active Surveillance total number of children examined were 2661 constituting 1394 Pharyngitis children & 1267 Non-Pharyngitis children. Amongst them there were no cases of RF/RHD.

In cases of Passive Surveillance out of 215 suspected cases i.e. 193 from OPD & 22 from IPD, 28 cases were diagnosed

having RF/RHD & were registered. They were given injectable Benzathine Penicillin as Secondary Prophylaxis every monthly depending upon their weight.

Among these 28 patients-19 were suffering from Rheumatic Fever. 9 were having Rheumatic Heart Disease (3 of them being old cases). The total prevalence of both RF and RHD was found to be 0.0/1000 among the school-children of the age-group 5-15 years. Diagnosis of RF was confirmed in 8.84% and RHD confirmed in 2.8% of the patients suspected to have the disease (215) among those attending the OPD/IPD. Majority of the cases belonged to 11(17.85%) years and 12(25%) years.

**Table 1:** Distributions of cases according to age

Age	5	6	7	8	9	10	11	12	13	14	15
Number of patients	0	1	2	3	4	2	5	7	1	2	1
Percentage	0	3.57%	7.14	1.071	14.28%	7.14%	17.85%	25%	3.75%	7.14%	3.57%

The prevalence was found to have Male Preponderance. Male/Female ratio was 1.5:1. Clinical Manifestations of Rheumatic Fever: Arthritis is the predominant clinical manifestation constitutes 75% of the cases i.e. 21 cases and followed by carditis 21.43% of the cases i.e. 6 cases and followed by chorea 3.57% of the cases i.e. 1 case. 14.29% of the cases (4 cases) presented with both arthritis and carditis, as shown in table no 2.

**Table 2:** Clinical Manifestations

Serial No.	Manifestations	No of Cases	Percentage
1	Arthritis	21	75%
2	Carditis	6	21.43%
3	Chorea	1	3.57%

Rheumatic Heart Disease was found in 9 patients, 3 of them being old cases. Findings on Echocardiography shows Mitral Stenosis in 5 cases (55.55%) being the highest finding in these cases, 3 cases showed Mitral Regurgitation and only 1 case showed Tricuspid Regurgitation and 2 cases presented with both Mitral Stenosis & Mitral Regurgitation, as shown in table no 3.

**Table 3:** Valvular Lesions

S. no.	Clinical Sign	No of Cases	Percentage
1	Mitral Stenosis	5	55.55%
2	Mitral Regurgitation	3	33.33%
3	Tricuspid Regurgitation	1	11.11%
4	Mitral Stenosis & Mitral Regurgitation	2	22.22%

Following these findings, the cases were classified under the following diagnosis as shown in table no 4.

**Table 4:** Disease Classification

S No	Classification	No of Case	Percentage
1	ARF With Carditis(1A)	4	14.29%
2	ARF Without Carditis(1B)	15	53.57%
3	RHD with Rheumatic Activity(2A)	5	17.86%
4	RHD without Rheumatic Activity(2B)	1	3.57%
5	Documented Past RF(3A)	3	10.71%
6	Not Documented (3B)	0	0.00%

Majority of the cases have Acute Rheumatic Fever without Carditis constituting 15 cases and 5 cases followed by RHD with Rheumatic activity and 4 cases constitute ARF with Carditis and 3 cases followed by RF & only 1 cases followed by RHD without Rheumatic Activity.

#### 5. Discussion

This present study was compared with previous studies and male preponderance was in contrary to conventional rule of equal distribution amongst male and females<sup>7</sup>, however some studies show female preponderance<sup>8,9,10</sup>. Rheumatic Heart Disease in school surveys conducted in different states Such as Punjab, Gujarat, Uttar Pradesh, Tamil Nadu, Rajasthan by ICMR have found cases, ranging from 0.2 to 1.1/1000 for RHD and 0.0007 to 0.2/1000 for RF<sup>11</sup> in active surveillance but not in this study where 0 cases were found during school surveys. Arthritis was the major manifestation as was in earlier studies. This study is also in correspondence to earlier studies which showed mitral Stenosis as the major finding in echocardiography<sup>12,13</sup>.

#### 6. Conclusion

Twenty eight cases of RF/RHD have been registered. Out of these 3 cases had RF with Carditis, 16 had RF without Carditis, 2 had RHD with Rheumatic activity, 3 had RHD without Rheumatic activity and 4 had past history of documented RF without RHD. Secondary Prophylaxis was provided to all of them regularly. However, the limitation of the study is only three districts were covered and each school were visited for a couple of days, and absentees from school were not examined. A more detailed and tenuous examination from all districts and all schools of the state may dig out the hidden cases from the state. Limitation of the field study is that Echocardiography could not be performed in school survey of RF/RHO. Systematic screening with echocardiography, as compared with clinical screening, reveals a much higher prevalence of rheumatic heart disease (approximately 10 times as great)<sup>14</sup>. ECHO criteria are very essential to prevent the morbidity and mortality in young. Hence when the Jones criterion undergoes next revision, then echocardiographic criteria should be included as necessary for the diagnosis of carditis

in ARF. ECHO can change the epidemiological face of ARF in India<sup>15</sup>.

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