

Original article**PREVALENCE OF RHEUMATIC FEVER AND RHEUMATIC HEART DISEASE IN SCHOOL CHILDREN IN MALWA REGION OF MP**P. Yadav¹, P. Joshi¹, J. Gupta³, D. Joseph¹, P. Sakhi²¹Department of Medicine, ²Department of Radiology, Sri Aurobindo Institute of Medical Science, Indore, ³Department of Anatomy, R.D Gardi Medical College, Ujjain**Correspondence:** drjitendra_gupta@yahoo.co.in**ABSTRACT**

Rheumatic fever and rheumatic heart disease continue to affect millions of people around the world. Children and adolescents of the developing countries are especially susceptible to this disease. To assess the prevalence of Rheumatic Fever /Rheumatic heart disease in an urban area, we do survey of children aged between 5 to 16 years studying in various government schools in Indore district which were selected randomly. Out of 9879 students enrolled in the study 9526 were examined, the percentage of absentees being ten. Revised Jones criterion (1992) was used for the diagnosis of rheumatic fever. Doppler echocardiography is used to confirm the diagnosis of rheumatic heart disease. A total of seven cases of definite rheumatic heart disease (out of 13 suspected cases) were identified giving overall prevalence rate of 0.73 per 1000. Fifty percent rheumatic heart disease cases gave a history suggestive of rheumatic fever. No case of active rheumatic fever could be identified. The study gave lower result than that reported in earlier studies from developing countries but it is similar to that reported from Indore district in 2009. It is concluded that there is some downward trend in rheumatic fever / rheumatic heart disease prevalence but the low prevalence is also due to the use of Doppler echocardiography which has prevented over diagnosis in the present study.

Key words: Acute Rheumatic Fever, Jones Criteria, Doppler Echocardiography**INTRODUCTION**

Rheumatic fever results from an autoimmune response to infection with group A streptococcus. Although the acute illness causes considerable morbidity, and some mortality, the major clinical and public health effects derive from long-term damage to the heart valves, i.e. rheumatic heart disease (RHD). Over the past century, as living conditions have become more hygienic and less crowded, and nutrition and access to medical care have improved, acute rheumatic fever (ARF) and RHD have become rare in developed countries. But, rheumatic fever/rheumatic heart disease is the commonest cardiac disease in children and young adults and remains a major public health problem in developing countries. Children and young adults are still dying from acute RF and RHD in these countries. The mortality rate for RHD varies from 0.9 to 8.0 per 100,000 every year. Accurate data on the incidence of RF are not available for developing countries, but among socially and economically disadvantaged populations it is likely to approach 100 / 100,000 in children. In the industrialized countries incidence of RF is below 5 per 100,000 per year.

However, the recent resurgence of RF in middle class families in some economically developed countries has emphasized the fact that even in these countries, the disease still has the potential to strike^{1,2}

In countries for which data are available, the prevalence of RF/ RHD in school children in different studies done two decades ago ranged from 0.3 to 21.0 per 1000. In several developing countries the only available data are from hospital morbidity figures, which give a poor picture of the problem, and RHD accounts for 12 to 65 percent of all cardiac patients admitted to hospital. Relatively high rates of RF/ RHD in developing countries are difficult to evaluate because of irregularities in reporting and investigative procedures. In most developing countries, more than 50 percent of RF/ RHD patients are unaware of their monthly benzathine penicillin for secondary prophylaxis³.

In India one published study on RF/ RHD prevalence has been done⁴ till today in a Malwa region which revealed 0.73% per 1000. Our study has been done in government school children of Indore district. A recent study shows prevalence of RF/RHD in India is 0.46%/1000⁶.

MATERIAL AND METHODS

A detailed Proforma was prepared based on revised Jones criteria (1992)⁵ with suitable modifications.

Survey was carried out in district of Malwa region Indore. The sample size consisted of 9526 school children of 5 to 16 years age group. Children were examined in their classrooms during school time. Physical examination with emphasis on the

auscultation of the heart was done by physicians with special training in cardiology. Cases with murmurs of grade 2 or above, pan systolic murmur, diastolic murmur and cases with past history of RF but without murmur were noted as suspected cases and were requested to attend cardiology department of Sri Aurobindo Institute Medical College Indore for further investigation. Revised Jones criteria (1992) was used for the diagnosis of acute RF. The diagnosis of RHD was confirmed by echocardiography and Doppler findings.

Schools were visited repeatedly to cover maximum number of enrolled students. A list of absent students was maintained. Inquiry was made with the fellow students and concerned class teachers to know if they were absent due to illness. Such absent students were examined on subsequent visits.

RESULTS

Out of 9879 school children enrolled in the study 9526 were examined giving a Convergence ate of 90 percent. Ten percent absentees could not be covered even on repeated visits due to various

causes. Age and sex distribution of the children is shown in table 1.

Table1: Age & Sexwise distribution of study cases

Age group (years)	Sex		Total
	Male	Female	
5-8	1019	783	1802 (18.9)
9-12	1435	979	2414 (25.3)
13-16	3462	1848	5310 (55.7)
5-16	5916	3610	9526 (100%)

Male/female ratio – 1.63

Thirteen cases were suspected to have RHD, but only in seven cases the diagnosis of RHD was confirmed. No cases of active RF could be identified. All RHD cases were from the age group 13 to 16 years. Four (57.1%) were female and three (42.8%) were male. Three (42.8%) of these were known cases of RHD receiving penicillin prophylaxis. Three (42.8%) cases gave past history suggestive of rheumatic fever, two (28.5%) cases gave history of polyarthralgia and one case had neither major nr minor manifestations but had frequent pharyngitis. The overall RHD prevalence rate was found to be (0.73%) per 1000.

Table 2: Sex wise distribution of ARF and RHD

No.	Disease	Male	Female	Total	Age group (yrs)
1.	Acute Rheumatic Fever	0	0	0	-
2.	Rheumatic heart disease				
	a) Mitral regurgitation (MR)	1	2	3 (42.8%)	13-16
	b) Mitral stenosis – (MS)	0	1	1 (14.2%)	13-16
	c) Mitral Stenosis + Aortic regurgitation (MS+AR)	0	1	1 (14.2%)	13-16
	d) Aortic Stenosis + Aortic Regurgitation (AS+AR)	1	0	1 (14.2%)	13-16
	e) Aortic regurgitation (AR)	1	0	1 (14.2%)	13-16

Out of seven positive cases, echocardiography and Doppler findings confirmed pure mitral regurgitation (MR) in three cases, pure mitral stenosis (MS) in one, pure aortic regurgitation (AR) in one, combined aortic stenosis (AS) and AR in one, combined AR and MR in one (table 2). Thickening of the involved valves was present in all the six cases.

DISCUSSION

This study shows the RHD prevalence in school children aged 5 to 16 years to be 0.73 per 1000.

Doppler echocardiography has played an important role in reducing the RHD prevalence by reducing over diagnosis. In our study if Doppler echocardiography confirmation of the diagnosis would not have been undertaken, the prevalence

rate would have been found to be higher i.e. 2.6 per 1000.

Diffuse thickening of the involved valves was present in all cases of RHD. Similar findings along with focal nodular thickening of the tips and bodies of the mitral leaflets have been reported in one fourth of patients with acute rheumatic carditis in a recent echocardiographic study⁵. Echocardiography is the most sensitive and confirmative diagnostic method in cases of chronic RHD.

In our study no case of acute RF could be identified, ours being a point survey type of study it was rather difficult to identify such cases. Children with fever and tender swollen joints were not expected to be attending school. Because of lack of medical units in these schools, the school administration could not inform us on follow up

visits about any child having signs and symptoms of acute RF.

CONCLUSION

The prevalence of RHD in school children in Indore district is found to be 0.73 per 1000. In recent year prevalence of RF/RHD has been decreased mainly due to better medical facilities, urbanization & peoples awareness towards health. Therefore, the problem of RF/RHD in our context is quite great due to seriousness of this disease leading to disability in young adults, high mortality and morbidity and high costs of surgical treatment. We feel that there is an urgent need to launch a national program for the control of RF/RHD in India with emphasis on primary and secondary prophylaxis of the disease.

Table 3: Prevalence of RF/RHD in various region

No.	Country/region	Year	Prevalence per 1000
1.	Nepal	1990	1.35 ^{4*}
2.	Ethiopia	1992	4.6 ⁷
3.	Saudi Arabia	1990	2.4 ⁸
4.	Sudan	1992	3.0 ⁹
5.	Northern India	1993	2.1 ¹⁰
6.	Egypt	1990	5.0 ¹¹
7.	Jambiya	1997	12.5

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