

# PREVALENCE OF RHEUMATIC HEART DISEASE IN SCHOOL CHILDREN

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## ABSTRACT

A total number of 8449 school children, in the 5-15 years old, group were examined clinically for evidence of valvular lesions and confirmed by roentgenographic, electrocardiographic and echocardiographic findings. Twelve children (0.14%) were suffering from rheumatic heart disease (RHD). The disease was significantly more ( $p < 0.05$ ) prevalent in the higher age group of 11-15 years as compared to younger children. Boys (0.18%) were affected more than girls (0.09%). The disease was more frequent among children belonging to economically backward group (0.34%) and those living in large families (0.28%). Children living in the slums had significantly ( $p < 0.05$ ) higher prevalence (0.41%) than those residing in urban areas (0.06%). Only 3 out of 12 (25%) were previously diagnosed cases and remaining were diagnosed for the first time. Past history of rheumatic activity was seen in 41.67% cases. Mitral valve involvement was most frequent, being detected in 10 (83.33%) cases. Majority of cases (58.33%) had the development of symptomatic RHD within 2 years of having suffered from RF. Our study helped to detect the hitherto undiagnosed cases of RHD and showed that its prevalence was higher in older children and those from urban slums.

**Key words:** School children, Rheumatic heart Disease, Rheumatic fever.

Rheumatic fever (RF) and rheumatic heart disease (RHD) continue unabated in developing countries whereas the disease almost disappeared in the developed countries during the last two decades(1). However, the recent resurgence of RF in the United States has again re-emphasized the need for better understanding of its pathogenesis and epidemiology so that appropriate preventive measures can be more effective(2). The present study was undertaken to find out the magnitude of the problem of RHD in children and to make an early diagnoses to prevent further complications.

## Material and Methods

This study was conducted at S.N. Medical College, Agra from July 1989 to December 1990. Eight thousand eight hundred and forty nine school going children of Agra city, between the ages of 5 and 15 years, were studied. Random selection of schools was done in such a way that the sample drawn represented children from various ages, both sexes, socio-economic and religious groups. All children included were subjected to thorough clinical examination with particular emphasis on the cardiovascular system. Children suspected of having any valvular lesion were re-examined by a cardiologist in order to confirm the diagnosis of cardiac involvement. The final diagnosis was made on the basis of clinical, roentgenographic, electrocardiographic and M-mode echocardiographic findings. The laboratory investigations included total and differential white cell counts, erythrocyte sedimentation rate, C-

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reactive proteins, throat swab for streptococcal culture and blood for anti-streptolysin O (ASO) titre estimation.

Revised Jones criteria(3) were used for the diagnosis of rheumatic fever. The presence of mitral and/or aortic murmurs due to established valvular lesion with or without evidence of rheumatic fever, were accepted as evidence of RHD.

The homes of the affected children were also visited in order to elicit the socio-medical history in detail. Socio-economic status was assessed on the basis of classification given by Agra Development Authority (ADA), Agra in 1989(4). Those having monthly family income less than Rs. 700/- were labelled as economically backward group, between Rs. 700 and 1500 per month as low income group, between 1500 to 2500 as middle income group and those having more than Rs. 2500 per month as high income group. The data were analysed by Chi square and 'Z' tests.

## Results

Only 12 out of 8449 students were found to be suffering from RHD (Table I). This gives an overall prevalence of 0.14% or 1.4 per 1000 children. The prevalence rate of RHD was significantly higher ( $p < 0.05$ ) in the 11-15 years age group that at other ages. The percentage of boys with

RHD (0.18%) was more than girls (0.09%) ( $p > 0.05$ ). The prevalence among Hindus was 0.18% in comparison to 0.08% in Muslim; the difference was not statistically significant ( $p > 0.05$ ) (Table I).

The prevalence of RHD was observed to be highest among economically backward group (0.34%). The prevalence in other social groups was 0.21% in low income group and 0.10% in both middle and high income groups. Moreover, these data were not found to be statistically significant ( $p > 0.05$ ) among children living in the slums (0.41%) than those residing in the urban areas (0.06%). A higher prevalence of RHD was noticed in larger families; the prevalence was 0.28% in the families having more than 10 members, while 0.11% in those having less than 5 members. Majority of cases (75%) were diagnosed for the first time during the survey.

Past history of rheumatic fever was obtained in 10 patients while rheumatic activity was present in 5. Mitral valve involvement was most frequent, being detected in 10 (83.3%) cases whereas aortic regurgitation was seen in 2 (16.7%) cases only.

On the basis of past history of rheumatic fever, majority of cases, 7 out of 12 (58.3%) had developed symptomatic RHD within 2 years of first attack of RF. No history of RF could be obtained in 2 cases.

TABLE I—Distribution of Cases of Rheumatic Heart Disease

Age group (yr)	No	Male		Female		Total	Age specific prevalence (%)
		Hindu	Muslim	Hindu	Muslim		
5--8	3067	1	—	1	—	2	0.065
8--11	3096	1	1	—	1	3	0.097
11--15	2286	6	—	1	—	7	0.306*

\*  $p < 0.05$ , when compared to other age groups.

## Discussion

The observed prevalence of 0.14% or 1.4 per 1000 for RHD is comparatively lower than that reported in studies from India(5,7). However, these figures are comparable to those of Padmavati(8) and Shah, *et al.*(9).

RHD was significantly more prevalent among older children. This observation is in agreement with the findings of others(5,9). This is expected, since the incidence of first attack of rheumatic fever is highest between 6 and 10 years and low below the age of 5 years(1, 10).

In this study, the prevalence of RHD was more in boys compared to girls. This observation is in accordance with the observations of other researchers(8,11,12). Western studies have shown a higher incidence of RHD in children belonging to low income group(1,2,8,12). In this study too, the disease was seen to be more frequent among lower income groups. The high incidence in low socioeconomic group is attributed to overall low standard of living associated with poorly ventilated, overcrowded houses and poor-nutritional status. All these factors contribute to higher prevalence of disease in children living in the slums.

The percentage of cases giving past history of rheumatic fever (83.3%) is slightly higher in this study than in other reports from India(11,12). However, Zaher, *et al.*(5) found past history of rheumatic fever in 91.7% cases. The short interval (2 years in 58.3%) cases between first attack of rheumatic fever and development of symptomatic RHD can be ascribed to the predominance of "accelerated" form of RHD in the developing countries including India(1,12).

The precise pathogenetic mechanisms

involved in the production of rheumatic fever as a sequel to streptococcal pharyngitis are unclear. Immunogenetic susceptibility has been incriminated but the genetic markers susceptibility are still under investigation(13,14). Recently the patients of RHD were noted to have an increased frequency of HLA-DR3 locus and decreased cell mediated immunity to streptolysin O(15). The above study highlights the need of frequent, time bound screening programme to assess the point prevalence of the disease and to provide the primary prophylaxis with prompt antibiotic treatment of upper respiratory tract streptococcal infections.

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## NOTES AND NEWS

### AN UPDATE IN PEDIATRIC GASTROENTEROLOGY

An Update in Pediatric Gastroenterology sponsored by the Medical Council of India and American Association of Physicians of India is scheduled to be held at the Maulana Azad Medical College, New Delhi from 5th to 7th February, 1993.

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The Scientific Programme includes sessions on acute diarrhea, chronic diarrhea, hepatobiliary diseases, GI hemorrhage, esophageal disorders, abdominal pain, portal hypertension, pseudo obstruction, constipation and imaging in gastroenterology. (The programme also features Question Answer session and special Quiz for participants.)

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