Rheumatic fever and rheumatic heart disease: how often we suspect infective endocarditis

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Abstract

Introduction: Rheumatic fever and rheumatic heart disease is a common problem in developing countries. Rheumatic valvular heart disease is one of the important risk factor for infective endocarditis.

Methods: Retrospective study was conducted among 56 children admitted in cardiology ward of Kanti children hospital with the diagnosis of rheumatic fever or rheumatic heart disease during May 2008 to May 2010.

Results: We found male to female ratio 2: 1, median age 12 (5- 14yrs) with the most affected age group of 11- 12 years. Common symptoms were fever (66%), dyspnea (68%), joint pain (50%), palpitation (30%), cough (16%) and chest pain (12%). Only 9% of patients had positive history of sore throat. Sixty percent patients were presented with features of congestive cardiac failure (CCF). ASO positive was found in 25 (44.6%) cases. The most common valvular lesion was mitral regurgitation (MR). Moderate to severe mitral regurgitation was found in 89% of cases. Tricuspid regurgitation (TR) was found in 57% of patients and aortic regurgitation (AR) in 55% of cases. Thirty-two patients (57%} had PAH in which 8 patients has severe PAH and 24 patients had mild to moderate PAH. Infective endocarditis was diagnosed in twenty patients (35.7%). Out of 20 patients 14 (70%)had vegetation in echocardiography. The mortality was 11% in this study.

Conclusion: Infective endocarditis is the major complication of rheumatic heart disease among children of Nepal and so clinical suspecian is important whenever patients with rheumatic heart disease present with fever.

Key words: dyspnea, endocarditis, rheumatic fever, rheumtic heart disease.

Introduction

Rheumatic fever is an immunological disorder caused by Group B beta hemolytic streptococcal infection leading to connective tissue damage of the heart, joints, brain and subcutaneous tissue. It usually occurs in children between the ages of 5 to 15 years and rarely in children less than four. Rheumatic fever (RF) is an illness characterized by the presence of one or more of the following findings: arthritis, carditis, rash, chorea, and subcutaneous nodules. Clinical findings of RF are usually preceded by symptoms of Strep sore throat. [1]

The incidence of rheumatic fever following streptococcal throat infection in the western countries is 0.3 percent in the general population[2]. The global incidence of rheumatic fever is 282/10000 populations.[3] In Kanti Children Hospital, rheumatic heart disease and rheumatic fever were diagnosed in 60 cases (18%) out of 330 patients admitted in cardiac ward during 2006-2007.

Infective endocarditis is an infection of the heart's inner lining (endocardium) or the heart valves and may be caused by bacteria, fungi, or other infectious substances. Streptococcus viridans is responsible for about 50% of all

bacterial endocarditis cases. Other common organisms are Staphylococcus aureus and enterococcus. The risk factors of infective endocarditis are congenital heart disease, rheumatic heart disease, prosthetic heart valve etc.[2]

Methods

This is a retrospective study. Ethical approval from hospital research committee had been taken before data collection. The patients who were admitted in the cardiac ward of Kanti Children Hospital during May 2008 to May 2010 with the diagnosis of Rheumatic fever or Rheumatic heart disease with or without infective endocarditis were included in this study. The congenital heart disease and patient with post cardiac surgery cases were excluded from the study. The data was collected in a standardized proferma with detailed history and clinical findings, x-ray chest, ECG, Echo reports, laboratory findings and received treatment. All the information was entered in SPSS software and the statistical analysis was done.

Case definitions:

Arthritis: Swelling and pain of joints usually migratory polyarthritis.

Carditis: Abnormal heart rhythms, increased heart rate, abnormal electrocardiogram (prolong PR interval), chest pain, pericardial rub, features of heart failure, appearance of new murmer.

Sydenham's Chorea (St. Vitus's dance): Involuntary movement, most commonly involving the hands and face, including the tongue and making speech incoherent. Subcutaneous nodules: Painless, small (less than 1 cm) bumps, found mostly over bony areas.

Erythema Marginatum: Red rash usually on the trunk and spreading outward with resolution of the central area.

Minor Manifestations of the Jones criteria were included as fever, joint pain, and arthralgia, prolonged PR interval in ECG and increased ESR or CRP.

Supportive evidence: Raised ASO titer and positive throat swab culture.

The rheumatic fever (RF) was diagnosed according to John's criteria.

The rheumatic heart disease (RHD) was diagnosed on the basis of history, clinical findings and echocardiography.

Infective endocarditis was made on the basis of history, physical findings, positive blood culture and vegetation seen in echocardiography.

Results

During the two-year of the study period, total 336 patients were admitted in cardiac ward and among them, 58(17%) patients were rheumatic fever or rheumatic heart disease cases. Out of 58 patients, 2 patients were excluded from the study group because of unavailability of patients' detail. Among the study population, male to female ratio was 2: 1 and median was age 12 with age range of 5- 14yrs. The highest affected age group was 11- 12 year (Table 1).

The most common symptoms were fever (66%), dyspnea (68%), joint pain (50%), joint swelling (11%), palpitation (30%), cough (16%) and chest pain (12%). Only 9% of patients had positive history of sore throat. Sixty percent patients were presented with features of congestive cardiac failure (CCF) (Table 2). ASO positive was found in 25 (44.6%) cases. Out of 56 cases, 22 (39%) cases were found to have rheumatic activity on the basis of Jones criteria. None of the patients had subcutaneous nodule or erythema marginatum or rheumatic chorea.

Table 1: Age and sex distribution of study population

Age (in yrs)	Male (n=37)	Female (n=19)
5-6		1
7-8	2	3
9-10	9	4
11-12	17	8
13-14	9	3
Total	37	19

Table 2: Showing clinical features of study group

Clinical features	No. (n=56)	Percentage (%)
Fever	37	66
Dyspnea	38	67.8
Joint pain	28	50
Joint swelling	7	12
Palpitation	17	30.3
Chest pain	7	12.5
Cough	9	16
Edema	34	60.7
Sore throat	5	8.9
Rheumatic activity	22	39
CCF	39	69.6

The most common valvular lesion was mitral regurgitation (MR). Moderate to severe mitral regurgitation were 89% of cases. Tricuspid regurgitation (TR) was found in 57%

of patients and Aortic regurgitation (AR) in 55% of cases. About half of patients had already developed mild to severe pulmonary arterial hypertension (PAH) on admission. Thirty-two patients (57%} had PAH in which 8 patients had severe PAH and 24 patients had mild to moderate PAH. Two patients had blood culture positive (Table 3).

Table 3: Echocardiography and laboratory finding of study population

Echocardiography	No. (n=56)	Percentage (%)
Mitral regurgitation	50	89.2
Tricuspid regurgitation	32	57
Aortic regurgitation	31	55.3
Mitral stenosis	4	7
Aortic stenosis	5	8.9
Pul. Arterial Htn (PAH)	32	57
Vegetation	14	25
Pericardial effusion	7	12.5
Laboratory		
ASO positive	25	44.6
CRP positive	16	28.5
Blood culture positive	2	3.5
Prolong PR interval	2	3.5

Table 4: Showing final diagnosis of RF/ RHD.

Diagnosis	No (n =56)	Percentage (%)
ARF / valvular lesion / CCF	13	23.2
ARF / valvular lesion/ no CCF	7	12.5
ARF/ valvular lesion/ IE/ CCF	2	3.5
RHD / valvular lesion / IE / CCF	8	14.2
RHD /valvular lesion / IE / no CCF	10	17.8
RHD / valvular lesion / CCF	16	28.5

ARF- acute rheumatic fever. RHD- rheumatic heard disease. CCF- congestive cardiac failure. IE- infective endocarditis.

Almost one-third of patients (20) were diagnosed as infective endocarditis. Out of 20 patients, 14 patients (70%)had vegetation on echocardiography along with positive blood culture in 2 cases (10%), both of streptococcus pneumonae. Six patients were treated as infective endocarditis on the basis of clinical judgment. Acute rheumatic fever (ARF) was found in 27 (48%). Established rheumatic heart disease (RHD) was found in 34 (60%)cases. The mortality was 11%(6) in this study. Out of 20 cases of infective indocarditis, four patients (20%) died and two patients died because of RHD and CCF.

Discussion

During the two-year of the study period, total 336 patients were admitted in cardiac ward and among them 58(17%) patients were rheumatic fever or rheumatic heart disease. Some studies done by different authors in community level, found that the prevalence of RF and RHD was 1.2 – 1.35 per 1000 in children.[4, 5]

In this study, male to female ratio was 2: 1 and median age was 12 with age range of 5- 14yrs. The highest affected age group was 11- 12 year (Table 1). Similar study done by M. Mastafa et al found mean that age of RF was 12.6 year.[6]

In our study, common symptoms were fever (66%), dyspnea (68%), joint pain (50%), palpitation (30%), cough (16%) and chest pain (12%). Only 9% of patients had positive history of sore throat. Sixty-nine percent patients were presented with features of congestive cardiac failure (CCF) (Table 2). We could not find any cases of rheumatic chorea, subcutaneous nodule and erythema marginatum. ASO positive was found in 25 (44.6%) cases. The most common valvular lesion was mitral regurgitation (MR). Moderate to severe mitral regurgitation were 89% of cases. Tricuspid regurgitation (TR) was found in 57% of patients and Aortic regurgitation (AR) in 55% of cases. Thirty-two patients (57%} had PAH in which 8 patients has severe PAH and 24 patients had mild to moderate PAH. The mortality was 11% in this study. Similar study done by Rayamajhi A et al found that median age of the rheumatic fever or rheumatic heart disease was 11 (5-14) years, the male to female ratio was 1.6:1, sore throat 39%, fever 51%, arthralgia 37%, elevated antistreptolysin O (ASO) titer in 94%, elevated CRP 78%, prolonged PR interval 45%, pericardial effusion 22%, cardiac failure 28%and joint pains 71%. The mitral valve was the most commonly involved valve (82%) and mitral regurgitation the commonest lesion (24%) and 10% mortality.[7]

A study done by Ma Sylva et al showed 1.4 percent prevalence rate of infective endocarditis among patients with RHD.[8] In contrast, we found infective endocarditis in

20 patients (35.7%) and out of 20 cases 14 cases (70%) had vegetation in echocardiography. This is probably due to majority of patients of rheumatic heart disease in our country presented in hospital only after severe complications like infective indocarditis. Coward, Keith MD et al reported out of 76 cases of infective endocarditis, vegetations found in 67%cases[9]. S. Bhandari, U. Kaul et al reported that out of 38 episodes of infective endocarditis (IE), twenty-three patients (68%) had rheumatic heart disease (RHD), while 11(29%) patients had congenital heart disease (CHD). Echocardiography was diagnostic of IE in 10 of 12 patients (83%) in whom it was performed and blood culture was positive only in 15 cases (40%). [10] In conclusion infective endocarditis and pulmonary arterial hypertension were major complications of rheumatic heart disease. Regular echocardiography might be helpful for early detection.

References

1. Lennon D. Acute rheumatic fever in children: recognition and treatment. Paediatric Drugs 2004; 6(6): 363-373.
2. Daniel Berstein. Infetive Endocarditis. In:Behrman RE, Kliegman RM, Jenson HB Nelson Text book of Paediatrics, 17th ed. Philadelphia 2004:1565-1568.
3. Mishra TK. Acute rheumatic fever and rheumatic heart disease: current scenario. Journal of Indian Association of Clinical Med 2007; 8(4): 324-330.
4. Regmi PR, Pandey MR. Prevalence of rheumatic fever and rheumatic heart disease in school children of Kathmandu city. Indian Heart J 1997; Sep- Oct 49(5): 518-20.
5. Shrestha UK et al. Prevalence of rheumatic fever and rheumatic heart disease in school children in rural community of hill region of Nepal. Indian Heart J 1991; Jan-Feb 43(1): 39-41.
6. Mastafa M Zaman et al. Assocition of Rheumatic fever with serum albumin concentration and body iron in Bangaladeshi children: Case control study. BMJ 1998; Nov 7; 317 (7168): 1287-1288.
7. Rayamajhi A, et al. Clinical, laboratory and echocardiographic profile of acute rheumatic fever in Nepali children. Ann Tropical Paed 2007; Sep;27(3): 169-77.
8. Ma. Sylvia Theresa D Pido and Adrian C Pena. Outcome of Infective Endocarditis Complicating Rheumatic Heart Disease: The Philippine Heart Center Experience. Phil J Microbiol Infect Dis 1999; 28(4): 139-146.
9. Coward, Keith, et al. Infective endocarditis in Arkansan children from 1990 through 2002. Pediatric Infectious Disease Journal December 2003; 22 (12): 1048-1052.
10. Bhandari S, Kaul U, et al. Infective endocarditis in children, Ind J of Paed 1984; 51 (5): 529-532.