Rheumatic Fever Recurrences in Children: A Study of 38 Cases

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Abstract

Background- Rheumatic heart disease (RHD), which is one of the most common causes of cardiovascular mortality and morbidity in the world, occurs following repeated episodes of rheumatic fever (RF) recurrences. This study evaluated the RF recurrences to verify the clinical features of the disease and to determine the related risk factors in recurrences.

Methods- The medical charts of 38 cases of confirmed RF with recurrence who were admitted to our Pediatric Cardiology Unit from March 1995 to March 2001 were reviewed and evaluated. All demographic data and injection schedules were completely recorded.

Results- Of the 38 patients with recurrent RF, 25 (65.8%) were girls and 13 (34.2%) were boys. Their age at the time of their first attack ranged from 4 to 13 years with a mean (±SD) of 8.14 (±2.8) years. Carditis was the most common major manifestation (86.8%). Pure chorea was seen in 4 (10.5%) of the patients (2 boys and 2 girls) and isolated arthritis occurred only in one (2.6%) case. Major clinical manifestations were not statistically different in both sexes (p=0.38). Of the 38 patients, 37 (97.4%) cases were not on penicillin prophylaxis at the time of recurrence. In 15 (39.5%) of the patients, medical staff were responsible for the discontinuation of prevention and in 22 (57.9%) patients, secondary prophylaxis was stopped because of their own or their families' refusal.

Conclusions- The present study supports the need to concentrate on optimizing adherence to secondary prophylactic regimens in the years immediately following an episode of ARF and to assure medical staff and patients of the long-term benefits of benzathine penicillin administration to prevent recurrent RF. **(*Iranian Heart Journal*. 2002; 2(4)&3(1): 54-58)**

Key word: rheumatic fever < rheumatic recurrence < rheumatic heart disease

Rheumatic fever (RF) is the major cardiovascular health problem in many nations of the world.[1] Severe morbidity in RF is associated with cardiac involvement.[2] Permanent cardiac damage is worse with recurrences, and the cumulative effects of recurrences are responsible for the poor prognosis in rheumatic heart disease (RHD). [3]

Recurrences of RF are harmful and constitute the most potent prognostic factor. Preventing streptococcal pharyngitis can prevent recurrent RF. Because a group A β-hemolytic streptococcal (GABHS) infection need not be symptomatic to trigger a recurrence, continuous prophylactic antibiotic therapy is the only way to prevent recurrent attacks of rheumatic fever and should be instituted promptly in any patient who has documented RF or RHD.[4] A reduction in the number of RF recurrences with

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chemoprophylaxis has translated into a reduction in mortality due to RHD, [5] a reduction in prevalence of residual heart disease, and greater healing of cardiac damage sustained during the first attack.[6] We have reviewed the clinical records of 38 patients with recurrent RF seen during a 5- year period. We aimed to describe the clinical and demographic features of this disease and to assess the reasons of interrupted penicillin injection in our patients.

Methods

Patients with a past history of RF, who were referred with ARF to the pediatric heart department from March 1995 to March 2001, were enrolled in this study. The diagnosis of initial episodes of ARF was made according to the 1992 update of the Jones criteria, and recurrences were diagnosed according to the criteria specified in the same report.[7] Carditis was considered to be present if there was an organic cardiac murmur not previously documented or if there was clear evidence of pericarditis. In patients with known RHD, the diagnosis of a new carditis was based on evidence of new cardiac injury, such as acute pericarditis, sudden cardiac enlargement, congestive heart failure, or a newly detected murmur resulting from the involvement of a valve not previously affected.

Clinical information was collected by chart review, clinical examination and echocardiography as appropriate. Other data such as age at first attack, sex, injection schedule, duration of previous prophylaxis, causes of interrupting the prevention, and interval time between the initial and second attack were completely recorded.

The data were collected in a computerized data base and statistical analyses were performed using SPSS (version 10.05). Continuous data are expressed as mean (±SD). Categorical data were compared using χ^2 or Fisher's exact test as appropriate. A critical *p*-value of < 0.05 was used.

Results

There were 38 patients with recurrent RF who fulfilled the Jones criteria, of whom 25 (65.8%) were female and 13 (34.2%) were male (a female/male ratio of 1.9/1). The age of the patients at first attack ranged from 4 to 13 years: mean (±SD) and median were 8.14 (±2.8) and 8.5, respectively. The major manifestations of the patients are given in Table I.

Table I. Major manifestations in 38 patients with recurrent rheumatic fever

	Sex		
Major manifestations	**Females**	**Males**	**Total**
Isolated arthritis	1 (100%)	-	1 (2.6%)
Carditis	19 (73.1%)	7 (26.9%)	26 (68.4%)
Chorea	2 (50%)	2 (100%)	4 (10.5%)
Carditis and Arthritis	3 (50%)	3 (50%)	6 (15.8%)
Carditis and Chorea	-	1 (100%)	1 (2.6%)

The total number of patients who had carditis was 33 (86.8%). Thus, carditis was the first common major manifestation in recurrence. However, carditis was diagnosed nearly 2.7 times as frequently in females as in males. Furthermore, although isolated arthritis occurred only in the females while carditis with chorea was seen exclusively in the males, there were no statistically significant differences regarding sex (p=0.384).

Of the 38 subjects, 37 (97.4%) did not have complete penicillin prophylaxis and only one (2.6%) patient had recurrent RF while on regular benzathine prophylaxis. The recurrences occurred at a mean (±SD) of 21.1 (±18.9) months after the initial episode. The mean (±SD) duration of prevention was 10.8 (±12.5) months and the mean (±SD) duration without prevention before recurrence was 9.9

(±11.4) months. The distribution of the patients according to the interval between initial and second attacks, duration of prevention, and duration without prevention before recurrence is given in Figs. 1-3.

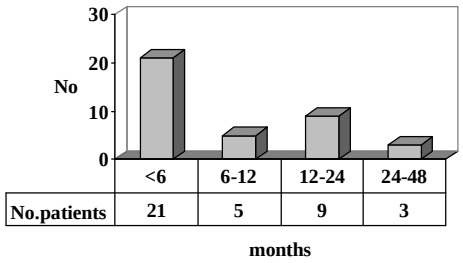

Fig. 1. Distribution of patients based on duration of prevention

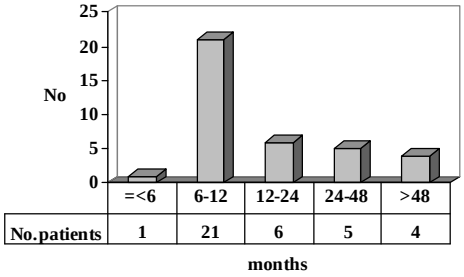

Fig. 2. Distribution of patients according to the interval between the initial attack and recurrence

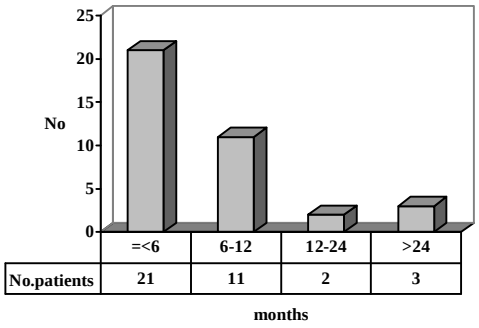

Fig. 3. Distribution of patients according to duration without prevention before recurrence

The discontinuous injection of penicillin in 37 of the 38 patients had two major reasons. In 15 (39.5%) patients medical staff were responsible such that in 4 (10.5%) cases physicians did not explain the need for secondary prevention, in 5 (13.2%) subjects due to a drop in the acute phase reactants titers in laboratory tests, other physicians stopped the prevention protocol; in 5 (13.2%) cases physicians did not emphasize the need for monthly injections on a long-term course, and in one case (2.6%) the nurse responsible for injection suggested that the prophylactic regimen should be stopped. In 22 (57.9%) of the 37 patients, the family or the patients themselves were responsible for prophylaxis discontinuation. Among these, 6 (15.8%) patients did not comply with chemoprophylaxis; in 2 (5.3%) subjects this was due to suggestions of their friends or family, and in 14 (36.8%) cases their parents did not comply with long-term benzathine penicillin injection.

Discussion

The age distribution in our patients was similar to that in many previous reports.[8,9] RF occurs usually between the ages of 5 and 15 years, but in developed countries the age distribution of RF patients may be different from that in developing countries. For example, the age range of RF patients in the recent resurgence in the United States was 3 to 17 years (mean, 9.7).[10] It seems that in developed countries RF occurs in younger children. In Bangladesh, the age range of their patients was reported to be from 3 to 30 years (mean, 12.7 years, SD ±4.4).[11] In the present series, however, none of the patients was older than 13 years old in the first attack.

It has already been noted in the past that the ARF recurrence incidence is highest in the first two years following the last attack of ARF, although the increased susceptibility appears to continue during adulthood as well.[12] It is postulated that the age distribution of ARF could be explained by the concept of

immunological priming by recurrent streptococcal infection.[13] This is supported by our data, which show that 32 (84.2%) of the 38 patients had recurrences within 2 years from the first attack.

In the present study, carditis was the first common major manifestation of recurrences. Carditis has been detected in 43% of patients in a study with a first episode of ARF and in 91% of patients with recurrences.[14] In a study from the tropical "Top End" of Australia's northern territory, 56% of patients without carditis at the initial episode had carditis with at least one recurrence, and arthritis occurred subsequently in 38% of those who did not have it initially.[15] Among our patients, nearly two thirds of all recurrences presented only with carditis. The high frequency of carditis in developing countries may be due to recurrences. Apart from immediate adverse effects of carditis during the acute phase of ARF, carditis is an unfavorable long-term prognostic factor and because of its high incidence in recurrence, secondary prophylaxis plays a significant role in reducing morbidity and mortality of RF.

During recent outbreaks of ARF in the USA, up to 71% of patients with chorea had associated carditis.[16] In studies from developing countries, the incidence of carditis with chorea has often been between 10% and 15%.[17,18] Our data do not support this fact as carditis only occurred in one (2.6%) case and 4 (10.5%) of all the patients had pure chorea. Although the sex association of ARF in different populations is not always uniform, the female predilection for chorea is an almost constant finding, [19] Our study did not support it, however: this fact indicates that in our society chorea is not more frequent in females, unless this is due to the small number of our sample size.

This study showed that except for just one case, all the patients with recurrence were not regularly on monthly benzathine penicillin and that the medical personnel were to blame in about one third of the cases. To resolve this problem, medical staff should be well educated on the significant benefits of secondary prophylaxis. Besides, about two thirds of the patients did not receive monthly injections either because of their own or their families' refusal. Thus, public education on the long-term benefits of benzathine penicillin prophylaxis to prevent recurrent RF is seriously warranted in our community.

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