Prognosis and Chemoprophylaxis of Rheumatic Heart Disease*

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THE word of "prophylaxis of rheumatic heart disease" has some implications. The first is how to prevent the rheumatic fever itself, the second is how to cure the rheumatic carditis and the third is how to cure or prevent the progression of valvular heart disease already exists. These necessarily involve some secondary problems, for instance, early diagnosis of carditis or usefulness of chemoprophylaxis on rheumatic fever or chronic valvular rheumatic heart disease (RHD). The last one is one of the most important but there are few direct data about it so far, though we can see some suggestive ones.¹ The main factor relating the prognosis of RHD should be clarified. Our clinical study was aimed to elucidate this point, with some direct and supportive evidences.

MATERIALS AND METHODS

(1) Overall rheumatic fever patients

There were 358 consecutive cases of rheumatic fever during 1953–1969, of which 178 were RHD. Age distribution: 5–15 years.

(2) Selective followed-up cases of RHD

There were 55 patients: 33 of them received continuous prophylaxis, 6 received only intermittent prophylaxis and 14 received no prophylaxis at all.

They were followed up with checks by a scoring system (Table I) which was designed for the evaluation of the change of organic state of individual RHD, not for the comparison of different cases each other. This system is equally used for mitral valvular disease and for aortic.

RESULTS

All cases of RHD were analyzed regarding the mode of occurrence:

(1) Directly from rheumatic fever with carditis

..... 80 (45%)

(2) unconsciously after rheumatic fever followed

by RHD-free interval of at least 6 months

..... 27 (15%)

TABLE I A SCORE FOR EVALUATION OF SEVERITY OF RHD

Term No.	Signs	
1	Functional capacity (N.Y.H.A.)	II
2	Functional capacity	III
3	Functional capacity	IV
4	Congestive heart failure	
5	Diastolic blood pressure	≤30
6	Diastolic blood pressure	= 0
7	Visible peripheral arterial pulsation	
8	Dizziness or anginal pain	
9	Apical regurgitant systolic murmur	
10	Apical mid-diastolic murmur	
11	Regurgitant diastolic murmur of aortic area	
12	Accentuation of IIP	
13	Left atrial hypertrophy on ECG	
14	Left ventricular hypertrophy on ECG	
15	Right ventricular hypertrophy on ECG	
16	Strain pattern on ECG	
17	Left atrial enlargement on X-ray film	I*
18	Left atrial enlargement on X-ray film	II*
19	Left atrial enlargement on X-ray film	III*
20	Left atrial enlargement on X-ray film	IV*
21	C.T.R.	≥0.53
22	C.T.R.	≥0.60
23	C.T.R.	≥0.65
24	C.T.R.	≥0.70

One mark for each term.

Nos. 1 to 3, 5 to 6, 17 to 20 should be accumulated (e.g.: No.3 = 3 marks, No.20 = 4 marks).

* Grades of left atrial enlargement:

I: visualization of left atrial appendage on the frontal view.

II: there is a displacement of barium filled esophagus but the body of the left atrium is not border forming on the frontal projection

III: left atrial body is border forming in the frontal projection

IV: giant left atrium

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Fig. 1. Extracardiac manifestations of rheumatic carditis (150 cases).

(3) unconsciously occurred without history of rheumatic fever 71 (40%)

Corresponding to the above data, the half of our cases of rheumatic carditis are solitary, namely, without any other major extracardiac manifestations (Fig. 1). On the other hand, it is well known that the carditis quite possibly switches over chronic valvular heart disease without corticosteroid therapy (56 out of 58 in our cases).

Table II shows the effect of chemoprophylaxis on the overall rheumatic patients and on the RHD patients only. Exclusively in the no prophylaxis group there were many recurrences, later occurrence of RHD, turning worse of RHD, changes of types of RHD and deaths from RHD. Atrial fibrillations were seen in both groups uniformly.

Fig. 2, 3 and 4 show the results of follow up with special scoring system.

Among 33 patients who received continuous prophylaxis there were no progressing cases except one subacute bacterial endocarditis and two atrial fibrillations which had no relation with

Fig. 2. [A] RHD patients who received continuous chemoprophylaxis.

Fig. 3. [B] RHD patients who received only intermittent chemoprophylaxis.

rheumatic activity. Moreover, 5 of mild mitral insufficiency lost their murmurs and turned into no heart disease (Fig. 2).

Six patients who received only intermittent prophylaxis all showed marked progression. Six overt recurrences, one death, 3 atrial fibrillations and one change of type (from MI to MSI) were seen (Fig. 3).

Twelve patients out of 14 who received no prophylaxis showed also marked progression. Five deaths and 10 overt recurrences were seen (Fig. 4).

In summary, the mean increase of marks are -0.42 in A group, $+5.0$ in B group and $+3.0$ in C group respectively. There are highly significant differences in A vs B and in A vs C by chi square

TABLE II EFFECT OF CHEMOPROPHYLAXIS*

Subjects	Received prophylaxis	Received no prophylaxis
RF and RHD overall	Recurrence 0/70	57/134 (42.5%)
	Unconsciously occurred RHD. 0/70	27/134 (20.1%)
RHD only	overt progression 0/37	8/61 (13.0%)
	change of type of RHD 0/37	4/61 (6.6%)
	death 0/37	8/61 (13.0%)
	atrial fibrillation. 3/37 (8.1%)	3/61 (4.9%)

* Oral penicillin-V 200,000 units daily

RF: rheumatic fever

RHD: rheumatic heart disease, chronic valvular

Fig.4. [C] RHD patients who received no prophylaxis.

test ($p < 0.005$).

DISCUSSION

Looking at the patterns of occurrences of RHD, one may notice how many cases occur unconsciously without overt attacks of rheumatic fever. This means the subjective symptoms of rheumatic fever is sometimes very mild in case of solitary carditis either in the first attacks or in the recurrences, as I have claimed for years.² This fact explains why the RHD patients sometimes have no history of rheumatic fever, why RHD could occur with long interval after rheumatic fever without noticeable recurrences or why they often turn worse without overt reasons. It should be reasonable to suppose the group A-streptococcal infection as the primary factor here. If the chemoprophylaxis could suppress the above mentioned events, we can say it should be true. Our data shown on Table II and Figs. 2-4 would well prove this point.

Table II shows that there are neither recurrences nor the related events under the condition of continuous prophylaxis, namely, without

streptococcal infections. On the other hand, it was suggested that the events as the later occurrence of RHD, turning worse of RHD, change of type of RHD or death from RHD are all related to the recurrence. They are, we had better to say, the equivalents of rheumatic fever recurrence. Atrial fibrillation was proven to occur sometimes with the recurrence of rheumatic activity but not necessarily so.³

Figs. 2-4 shows how the recurrence concerns in the prognosis of RHD. It was more directly proven that the recurrence itself is the main factor of ruling prognosis of RHD. There are no progression of RHD as a rule under the continuous chemoprophylaxis. Atrial fibrillation and subacute bacterial endocarditis are rare exceptions. Disappearance of heart murmur of mild MI was already reported,⁴ but our data suggest that this will happen more likely under the condition of continuous chemoprophylaxis.

It was well proven that the RHD will turn worse as a rule without chemoprophylaxis and the main cause of it is the streptococcal infection and subsequent recurrences. We can say here it is

the grave obligation for the doctors to give all RHD patients oral penicillin continuously.

CONCLUSION

In rheumatic fever patients, recurrences and equivalent events as the later occurrence of RHD, progression of RHD, change of types of RHD or death from RHD are often seen without chemoprophylaxis and be well prevented with it. The symptoms of rheumatic fever are often unconscious in the recurrences as well as in the first attacks. Therefore, various manifestations actually caused by recurrences often look as if occurred without any relation to the recurrences.

The personal follow up study by a special scoring system shows that the RHD will turn

worse without chemoprophylaxis and will not turn worse with chemoprophylaxis as a rule. The use of oral penicillin essentially concerns in the prognosis of RHD.

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