Outside Europe

Rheumatic Fever Prophylaxis: A Three-year Study

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Summary

An effective programme of secondary prophylaxis against rheumatic fever has been established in Barbados over the last three years. Relatively unsophisticated patients collaborated well over prolonged periods. Adequate secondary prophylaxis was achieved with monthly injections of benzathine penicillin, with a resultant decrease in the complication rate.

A total of 84 admissions over 32 months from a population of some 60,000 children under the age of 12 emphasizes the need for registration and prophylactic treatment of children with rheumatic fever. The low yield in the survey of schoolchildren between the ages of 5 and 11 and the large number of personnel required for the survey suggest that it might be extended to include older age groups. Automatic screening devices should be used when possible so that more may be screened.

Introduction

There have been two major trends in the field of rheumatic heart disease in recent years. Perhaps the more dramatic has been the increasing range and effectiveness of cardiac surgery in patients with chronic rheumatic heart disease. Nevertheless, very few countries can afford the considerable cost involved and surgery has not greatly reduced the morbidity and mortality of this essentially-preventable disease.

The second major trend has been an increasing emphasis on prevention. Primary prevention would be the ideal method of coping with rheumatic fever in the community. Nevertheless, this would concern the early detection and adequate treatment of several thousand cases of group A streptococcal infections to prevent a single case of rheumatic heart disease.¹ Secondary prevention of rheumatic fever is more practicable and is essential for controlling the disease and its complications. Wilson has shown that 85% of patients with rheumatic fever suffer a recurrence within eight years of the first attack,² and Biorck reported that the incidence of valvular heart disease increases with each attack.³ Regular prophylaxis with penicillin greatly improves the prognosis, though this is achieved only infrequently or not at all in many communities.

A rheumatic fever programme was started in Barbados in 1970. We suspected that this disease was a major health problem and that several patients who had had one or more acute attacks

were not under continuing medical care and were not receiving regular prophylaxis. The first objective of the programme was to establish effective surveillance of known cases of rheumatic fever and rheumatic heart disease to improve the current methods of secondary prophylaxis. The second was to acquire information about the prevalence of this disease and to assess its effect on the health services. The third was to measure the yield, feasibility, and effectiveness of mass programmes for the detection and prophylactic management of rheumatic heart disease in schoolchildren.

A preliminary report of the first year of this study has already been made.⁴ We present here details of our experience after three years.

Methods

A clinic for rheumatic fever and rheumatic heart disease was established at this hospital. Patients were referred by general practitioners, by other hospital physicians, and from a school screening programme which was conducted during the first 12 months of the study. Patients were carefully assessed at their first visit to confirm the present or past diagnosis of rheumatic fever. They were classified as definite or equivocal according to the revised Jones criteria.⁵

The follow-up methods adopted in this study were reported previously.⁴ Patients with definite or equivocal rheumatic fever were put on a monthly regimen of benzathine penicillin injections and given identification cards which recorded scheduled injection dates and information to practitioners on the course to be followed should the patient develop an infection or need a surgical procedure. Completed cards were reviewed during and at the end of the study period and adherence to the prophylactic penicillin regimen was noted.

Prophylaxis was considered adequate in patients who missed less than 30% of scheduled injections and inadequate in those who missed more than 30%. An analysis was made of all patients admitted to the children's ward of this hospital with a diagnosis of rheumatic fever or rheumatic heart disease during the study period. The survey of schoolchildren between the ages of 5 and 11 years was discontinued after the first year because of the low yield (about 1/1,000 of the 3,882 children studied) and the relatively high costs of the survey.

Results

At the end of three years the rheumatic fever clinic consisted of 129 patients who had evidence of a previous attack of rheumatic fever. A total of 92 patients had valvulitis. Out of the 49 who had residual effects 24 were 12 years of age or less (table I).

Clinical assessment of the 49 patients gave results which are comparable with those reported from other parts of the world. Isolated mitral valve incompetence, the commonest cardiac lesion, was present in 26 patients. Combined mitral and aortic

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TABLE 1—Age and Cardiac Status of 92 Patients with Definite Rheumatic Fever attending Rheumatic Fever Clinic

Age (Years)	<5	6-12	>12	Total
No residual valvulitis	4	28	11	43
Residual valvulitis	4	20	25	49
Total	8	48	36	92

TABLE II—Relationship between Adherence to Prophylactic Programme and Occurrence of Direct Complications of Rheumatic Process

Prophylactic Category	No. of Patients	% Adherence to Prophylactic Programme	No. (%) of Patients with Complications
Adequate	115	97	2 (1.7)
Inadequate	14	69	3 (21.4)

valve disease was present in six, isolated mitral valve stenosis in eight, and the remainder had mixed mitral valve disease (three), isolated aortic incompetence (three), combined mitral valve incompetence, and pulmonary stenosis (three).

Of the 129 patients started on monthly injections of penicillin 115 were considered to have received adequate prophylaxis and 14 were considered to have received inadequate prophylaxis. The 115 patients received 2,295 monthly injections out of a possible total of 2,363; this represents a 97% adherence to therapy. The average level of adherence to therapy of the remaining 14 patients was 69% (table II).

Of the 115 patients receiving adequate prophylaxis 2 had relapses of rheumatic fever. Of the 14 whose prophylaxis was inadequate 3 had at least one complication (table II). These were exacerbations of rheumatic fever (one), subacute bacterial endocarditis leading to death (one), and progressive multi-valvular heart disease with death from pulmonary embolism (one). Finally, an attempt was made to determine reasons for the failure of 14 patients to receive adequate prophylaxis. Reasons for not having regular injections included fear of injections (three), religious beliefs (one), inadequacies of injection department (one), transportation problems (one), and failure to adequately motivate relatives (six). Two patients could not give a reason.

Between 8 October 1970 and 31 May 1973 84 patients were admitted to hospital with definite or equivocal attacks of acute rheumatic fever out of 3,609 admissions to the paediatric ward. The number of nights a bed was occupied by a patient with rheumatic fever was 2,694 (6.4%) out of 41,581. This represents continuous occupancy of three beds throughout the period at a monthly cost of at least U.S. \$1,260. Of the 84 admissions with a diagnosis of rheumatic fever, 67 (43 definite and 24 equivocal) were for a first attack and 17 (7 definite and 10 equivocal) were for a second or subsequent attack. Thus the rate of admission of new cases of rheumatic fever is 24 a year.

The level of collaboration in the school survey programme was high. Out of a total of 3,942 primary-schoolchildren between the ages of 5 and 11 attending four government primary schools in the Bridgetown area 3,882 (98%) were screened by the end of the first year. Only four cases of rheumatic heart disease were detected; a prevalence rate of about 1/1,000. Three other children had had previous attacks of acute rheumatic fever but no residual valvulitis. This relatively low yield did not seem to warrant the continuation of surveys of schoolchildren in the age groups selected. Subsequent emphasis was placed on registration and follow-up of clinically diagnosed cases.

Discussion

Reasonably firm conclusions may be drawn about how well the patients collaborated and the value of prophylaxis. An important finding was that relatively unsophisticated patients and their relatives in social classes III and IV can collaborate for a long period in a prophylactic programme against recurrence of rheumatic fever. This high level of collaboration was probably due to improved methods of patient surveillance with the introduction of rheumatic fever identification cards and with continued and vigorous efforts to persuade patients and their relatives of the importance of keeping the instructions on the card up to date.⁴ There are several advantages in using these cards: ready assessment of the level of adherence to the prophylactic regimen and elimination of the need for special tests to detect the presence of penicillin; active involvement of patients and relatives in recording the injections; improvement of the practicability and efficiency of the programme; removal of any uncertainty about the receipt of medication and enabling injections to be given in outlying clinics, in the offices of general practitioners, in hospital outpatient departments, or wherever may be most convenient for the patient.

The relatively low yield from the survey of schoolchildren between 5 and 11 gives added importance to early recognition and registration of clinical cases as they occur and for effective programmes for prophylaxis. Extension of screening programmes to older age groups and the possible use of automatic screening devices need to be considered.

In all countries in whatever stage of development the cost of such programmes must be an important consideration. The programme of secondary prophylaxis outlined in this paper has been achieved to date at a cost of about U.S. \$325 per month, considerably less than the current monthly cost of maintaining paediatric beds for rheumatic fever, which is estimated at U.S. \$1,260. Also the clinical deterioration that accompanies each recurrence of rheumatic fever must be considered.

This study is biased towards the younger age groups and the problem of rheumatic fever in the adult population of Barbados has not been examined in detail. Nevertheless, since the hospital admission rate of patients with a given disease usually represents only a fraction of its true prevalence in the community, 84 admissions to a children's ward of 40 beds over a period of 32 months, must be a source of concern. The high percentage of admissions with first attacks (79%) is in keeping with the figures of Gordis *et al.*,⁶ who showed that first attacks may represent as much as 85% of all cases of rheumatic fever. The need for continued efforts to register all new cases and to keep them under effective prophylactic surveillance therefore assumes even greater importance.

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References

- Strasser, T.; *Clinica Therapeutica*, 1971, 59, 15.
- Wilson, M. G., Quoted in *British Medical Journal*, 1972, 1, 64.
- Biorck, G., *Journal of Chronic Diseases*, 1955, 1, 591.
- Hassell, T. A., Renwick, Sonia, and Stuart, K. L., *British Medical Journal*, 1972, 3, 387.
- Committee Report, *Circulation*, 1965, 32, 664.
- Gordis, L., Markowitz, M., and Lilienfeld, A. M., *Pediatrics*, 1969, 43, 173.