

THE NATURAL HISTORY OF RHEUMATIC FEVER AND JUVENILE RHEUMATIC HEART DISEASE IN TAIWAN

By Hung-Chi Lue, Chiung-Lin Chen and Huoyao Wei

Dramatic decline in the incidence and severity of rheumatic fever (RF) and rheumatic heart disease (RHD) was reported from some developed countries such as Denmark, Norway, Canada and the United States of America¹⁻³. It is likely, however, that RF and RHD are still rampant and life-threatening diseases, causing many an invalidity and fatality in certain developing countries, and remain as a challenge to physicians, cardiologists and also to the public health workers. The purpose of the present communication is to report the natural history of the RF and RHD in Taiwan. Recognizing that RF and RHD are preventable and controllable disease, we are hoping that our report will point out some problems so that more effective and due actions may be carried out for the control of this disease.

MATERIAL AND METHODS

10,321 school children, aged 6 to 15 years, living in a suburban area of Taipei County, were surveyed in 1970 to 1971 for the detection of heart disease among our school children. Each child was examined by one of our house staffs. Those who had a murmur or other evidences of heart disease were re-called and re-examined by one (HCL) of the authors. A chest X-ray film and ECG were taken in each child. 433 non-respondents were not examined.

The incidence of RF and RHD among sick children was determined from the case materials admitted to the Department of Pediatrics, National Taiwan University Hospital during 1946 to 1970. The yearly frequency of RF and RHD among the inpatients was obtained. As the National Taiwan University Hospital is the most active, and major cardiac center for children in Taiwan, patients from nearly every corner of the island came to the hospital seeking advice or treatment. Diagnosis of RF and RHD was made according to the modified Jones Criteria or in the later period by the revised Jones Criteria. A prospective study for the natural history of RF and RHD was started in July 1967. The results of our treatment, the recurrence rates of RF and their compliance in keeping with the long term chemo-prophylaxis for streptococcal infection were studied. The lengths of stay at the hospital in each patient with active rheumatic carditis varied from 2 weeks to 12 weeks with an average of one month. Antirheumatic treatments used were, short-term, intensive steroids and/or followed by long-term Aspirin. In those with congestive heart failure Digitalis and diuretics were given. Patients were followed at the Cardiac Special Clinic, where monthly injection of Benzathine penicillin or daily administration of sulfadruugs were given or supervised for the prevention of streptococcal infection.

RESULTS

I. Hospital incidence of RF and RHD

The number of patients with RF and RHD has increased along with the increase of sick infants and children admitted to the pediatric wards of the National Taiwan University Hospital. The frequency of RF by years among admissions has been on the increase since 1946, from 0.7% in 1946 to 2.1% in 1969.

II. Incidence of RHD among school children

The prevalence rate of RHD among a group of 10,321 school children, aged 6 to 15 years, was 0.13%. RHD was more prevalent among junior high school children (0.17% of 2,288), than was among primary school children (0.11% of 8,046). These figures are in approximation to the incidence encountered in USA and Canada during 1950-60^{6,7}.

III. Clinical manifestations of RF

In 78.2% of our 340 patients clinical evidences of active carditis or RHD were found: Among 54 cases encountered in 1946-1957, 36 (66.7%) developed evidences of carditis; of 193 cases observed in 1958-1967, 151 (78.2%) had carditis; of 93 cases in 1968-1970, 79 (84.9%) had cardiac involvement. The incidence of carditis among cases of RF did not only decrease but also was on the increase. Of the most recent series of 89 cases of carditis 81 (91.0%) had cardiomegaly, and 62 (70.0%) developed heart failure and/or pericarditis, suggesting that RHD in Taiwan was severe, leading to heart failure in the majority of cases. In 8% of our cases two valves were involved. As a contrast to the severity of carditis the number of cases with typical polyarthritides was rather few being observed only in 30.0% of our children with RF.

IV. The compliance to the long-term chemoprophylaxis

Of 130 children admitted to our prospective study 80 were followed at our cardiac clinic for more than 6 months after discharge from the hospital. 50 cases failed to show up because of poor financial reasons or the remoteness and inconvenience in reaching the clinic. Only 31 (39%) of 80 cases being followed at the clinic stayed in long-term prevention of streptococcal infection. 24 children stayed in the program but were not compliant. 19 children dropped out, of whom 3 re-entered following suffering from a recurrence of RF. Frequent breaks or failures to stay in chemoprophylaxis remain as a big problem. It is most unfortunate to point out that in only one out of 9 children with RHD found at our mass field survey was given chemoprophylaxis by a cardiologist for streptococcal infection.

V. Recurrences of RF

Recurrences of RF were frequently observed. It is worth pointing out that 42 (43%) of 97 cases who recently came to our attention were suffering from the recurrent attacks of RF. Among our latest series of 100 cases 17 cases developed 1 or 4 recurrences of RF during a follow-up period of 255 patient years. The recurrence rate per 100 patient-years was thus 9.0.

VI. Outcome of RF and RHD

Among the group of 49 children observed in 1946-1960, in whom no regular chemoprophylaxis was effected, 12 (24.5%) died, and only 9 (18.4%) remained active with no symptoms. In contrast to the aforementioned group the prognosis was significantly improved in our latest group of 76 cases who had stayed in the long-term prevention of streptococcal infection for 1 to 9 (average 3.4) years. Among them only one with severe RHD of recurrent attacks died. 44 cases (57.9%) remained as active as healthy children. In 1 case mitral valve was replaced. The prognosis of children with RF and RHD who stayed in long-term chemoprophylaxis was clearly related with the status of the heart at the time antirheumatic treatment was started. In all 4 cases with grade I/VI apical systolic murmur the murmur disappeared. Most variable prognosis was seen among 40 cases in whom apical systolic and diastolic murmurs were heard. In none of 8 cases with double valve lesions the heart murmur disappeared.

VII. Children with chronic valvular lesions who underwent surgery

Seven out of 130 cases underwent surgical operations. Mitral commissurotomy was carried out in 2 cases with tight mitral stenosis. In 5 cases the mitral valve was replaced with an artificial valve prosthesis. All seven survived, and are now living and well.

SUMMARY AND CONCLUSIONS

Our limited informations indicate that RF and RHD remain as a serious problem in Taiwan. The incidence of RF and RHD in Taiwan is not decreasing as is in the developed countries, but may actually be increasing as shown by the admissions to the hospital. The prevalence of RHD, nowadays in Taiwan, among school children is 0.13%, being similar to the figures seen in the temperate country during the 1950-60. RHD was observed in 78% of children with RF and was generally severe with the heart failure occurring in more than half of the cases.

Recurrences of RF were quite frequent and were almost not curbed due to the very limited number of patients being placed on continuous prophylaxis against streptococcus infection. For effective control of this life-threatening illness more concerted medical and community efforts are needed.

REFERENCES

1. Rammelkamp, C. H. Jr.: "The Lewis A. Conner Memorial Lecture, Rheumatic Heart Disease—A challenge." *Circulation*, 17, 842, 1958.
2. World Health Org.: "Streptococcal and staphylococcal infections." *Wld. Hlth. Org. Techn. Rep. Ser.*, 394, 1968.
3. Massell, B. F., Amezcua, F. and Pelargonio, S.: "Evolving picture of rheumatic fever." *J.A.M.A.*, 188, 287, 1964.
4. Lue, H. C. and Chen, C. L.: "Clinical observation of rheumatic fever in children." *Acta Paediatrica Sinica*, 2, 113, 1961.
5. Lue, H. C.: "Rheumatic fever and its prevention." *Acta Paediatrica Sinica*, 8, 206, 1967.
6. Miller, R. A. *et al*: "The detection of heart disease in children: Results of a mass field trial with use of tape-recorded heart sounds." *Circulation*, 25, 85, 1962.
7. Miller, R. A. *et al*: "The detection of heart disease in children: Results of mass field trials with use of tape recorded heart sounds." *Circulation*, 32, 956, 1965.