THE CARDIAC CLINIC AND HOSPITAL—THEIR VALUE IN THE CONTROL OF THE RHEUMATIC INFECTION.

BY

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Within recent years there has been much discussion of the care of the rheumatic child. This has resulted in great part from our altered attitude to the pathology of rheumatism. The modern conception of rheumatism is that it is a chronic infection akin to tuberculosis. After the contagium vivum—whatever its nature—gains entrance to the body it lingers for long periods, dormant perhaps at times but with a great tendency to light up every now and again. Hence it is no longer considered sufficient to treat the acute manifestations as they arise, or right to look upon the disease as cured after their subsidence, but that for a long time afterwards treatment should be continued and a close watch kept for the development of a recrudescence. So far as the hospital class is concerned, and it is this class which provides the vast majority of our examples, this supervision may be carried out while the child is still at home through periodic visits to an out-patient clinic or by having him resident in a special hospital set apart for the purpose.

These out-patient clinics are variously named ‘cardiac clinics,’ ‘rheumatic clinics’ or ‘rheumatism supervisory centres’ and in spite of the writings of some of our English colleagues, they are all, whatever their designation, endeavouring to do the same work, namely, the avoidance of recurrences of the rheumatic infection and especially the avoidance of the development of cardiac disease. It was to focus attention on the latter—the gravest and really incapacitating manifestation of the infection—that the name ‘cardiac clinic’ was employed, and in our opinion there is much merit in its selection.

The special hospital for cardiac or rheumatic cases has the great advantage of removing the child from the predisposing environment. It has been remarked upon by most writers on rheumatism, at least so far as children are concerned, that it exacts its toll from the poorer, though not the poorest, classes of society. This would indeed seem to be one of the most definite facts about the disease. While examples of the condition are never wanting among one’s hospital clientele they are of the rarest occurrence in private practice. This strongly suggests that environment is a most important factor in its causation, a conclusion which is supported by the varying incidence of the disease among the same class of child when resident at home and when resident under good conditions, *e.g.*, in orphan homes. This was brought out in a striking manner by Dr. Benjamin¹ in his contrast of the frequency of the disease in children while resident in Poor Law Schools of London and in their own homes.

It is advisable that these special cardiac hospitals, not only for purposes of health but also for purposes of economy, be situated in the country. It must be perfectly understood, however, that they must be, at least if they are intended for the child the subject of cardiac disease, different from the ordinary convalescent home. It is necessary that the child be kept under strict medical supervision and it is advisable, considering the age of the patients and the duration of residence, that facilities be provided for the children to proceed with their education. These hospitals must be of the same type and staffed as those provided for surgical tuberculosis and orthopædic cases.

Though there have been for some years now facilities for the after-care of the rheumatic child in this country the work was only carried out in a half-hearted fashion and it was left to our American colleagues to take it up in their usual thorough manner. In most centres in America clinics for the continued after-care of rheumatic children have been instituted and are now part and parcel of pædiatric departments. It is perhaps to St. Lawrence of New York, however, that we are indebted for most stimulation.

Reports emanating from New York and other centres in U.S.A., but especially from the pen of St. Lawrence², stressed the benefits to be obtained from the after-care of both children and adults suffering from rheumatism and stimulated us to inaugurate in 1923 a cardiac clinic at the Royal Hospital for Sick Children, Glasgow, so that all examples of rheumatism admitted to the wards could be continuously supervised after their dismissal. This we believe was the first of its kind in this country. We had, however, only very limited accommodation for the prolonged in-door treatment of the cases until one year ago, when, through the generosity of an anonymous donor, we were provided with facilities for accommodating 12 children.

Since 1923 the routine practice in the treatment of the rheumatic child at the Royal Hospital for Sick Children, Glasgow has been as follows. All children admitted with chorea or arthritis, or other active manifestation of the rheumatic infection, are kept in bed for at least three months, as much, if not more attention being paid to the cases with early manifestations and the heart still intact. During their residence they are given a full course of salicylate, and advantage is taken of the opportunity to have the tonsils enucleated, and to have the teeth attended to whenever there is the least suspicion of disease. If the mischief seems quiescent at the end of the three months in bed the child is gradually allowed up, the daily amount of exercise being regulated by the behaviour of the pulse, and in a matter of 10 days or so he is sent for a period to a convalescent home. After returning to his own home the child reports periodically at the Cardiac Clinic, the frequency of the visits being governed by the necessities of the case. Some patients attend every fortnight while others again may only require supervision every two or three months. During this attendance at the clinic the children are given periodically courses of salicylate—two months on and two months off—teeth and throat are attended to, re-admission to Hospital or transfer to a convalescent home provided for as required, clothing and home conditions not being neglected and remedied

where possible. Careful notes are kept of the progress of the disease and we have now in consequence details of the history of some patients extending over as long a period as eight years.

The present communication is a record of our experience with these various facilities. In the first place we will deal with the results obtained at the cardiac clinic as these extend over the longest period—now five years. We have selected as the material for analysis those cases which first came under observation during the years 1922-1924 inclusive. This means that those attending the clinic had been under continuous supervision for a matter of five years, which we consider quite ample to enable us to judge whether or not the method is of any real value in combating the progress of the disease.

A certain number of our rheumatic children, either through lack of interest on the part of the parents or for other reasons, never did attend the clinic, and as many of these as possible were traced in 1928, their intervening histories obtained and their present condition observed. These cases which we call non-clinic cases have been used for comparison with the clinic cases. Thus we have a group of cases supervised and another group not supervised. It must be admitted that the comparison is not absolute since a certain number of the non-clinic cases who could not be traced may have died and others may have been too ill to appear at the hospital for examination, and hence the results relative to these non-clinic cases may appear better than they really are, but such a group is the only possible one we have available for our purpose.

There were 52 non-clinic children and 80 clinic children, and so far as recurrences of the disease are concerned it was found that there were fewer per person during the post-hospital period among the non-clinic than among the clinic cases (Table 1).

TABLE 1.

SHOWING CASE-INCIDENCE OF RHEUMATIC ATTACKS IN CLINIC AND NON-CLINIC CHILDREN.

Group.	Total No.	Attacks before adm. to hospital.	Average attacks per person.	Attacks after dismissal.	Average attacks per person.	Total no. of attacks.	Average attacks per person.
Non-clinic children ...	52	74	1.42	22	.41	96	1.8
Clinic children ...	80	121	1.53	42	.60	163	2.03

It will be readily understood that the parents of all the children would not co-operate equally well in this after-care and for a further analysis we have subdivided the clinic group according to whether the attendance was good, fair or bad (Table 2). Of these clinic children the highest incidence of recurrences was obtained among those cases who attended most regularly. The numbers are admittedly small but they certainly do not, any more than the comparison of the clinic and non-clinic cases, offer proof that regular attendance at the clinic, and continuous after-care of the rheumatic child, are any real protection against further attacks of the rheumatic infection.

TABLE 2.

SHOWING CASE-INCIDENCE OF RHEUMATIC ATTACKS IN THE CLINIC CHILDREN ACCORDING TO REGULARITY OF ATTENDANCE.

Group.				No. of cases.	Attacks before admission to clinic.	Attacks after admission to clinic.
Good attendance	...	...	...	45	71=1.58 per case	30=.66 per case
Fair	„	...	...	12	17=1.4 per case	3=.25 per case
Bad	„	...	...	23	34=1.48 per case	8=.34 per case

We have already remarked that the dominating factor in the rheumatic infection is the presence of cardiac disease. It was indeed for the prevention of this complication, or for its amelioration, that these clinics were instituted and hence it is of prime interest to follow the course of events in those children who had been satisfactorily supervised, and see if our efforts in this direction had been in any way rewarded. For the purpose of our analysis again the clinic and non-clinic children have been contrasted as well as those attending well, fair or badly with one another.

In the following table (Table 3) is shown the development of cardiac disease in the clinic and non-clinic cases during the post-hospital period—*i.e.*, the 5

TABLE 3.

SHOWING DEVELOPMENT OF CARDIAC DISEASE IN CLINIC AND NON-CLINIC CASES.

Group.	No. of cases.	Condition of heart on dismissal from hospital.	Condition on admission to clinic.	Condition in 1928.	Remarks.
Clinic children ...	80	40 — 40 +	40 — 40 +	35 —; 5 + 27 +; 11 — (2 died).	12% developed cardiac disease during attendance at clinic. 27% lost murmurs.
Non-clinic children	48	23 — 25 +	— —	19 —; 4 + 17 +; 5 — (3 died)	21% developed cardiac disease. 20% lost murmurs.

+ = Evidence of heart disease.

— = No evidence of heart disease.

years that the clinic has been in existence. These results show a slight but definite advantage in favour of the clinic cases, as only 12 per cent. of the clinic cases developed murmurs as against 21 per cent. of the non-clinic cases. It is interesting to note too that during the period of observation 27 per cent. of the clinic cases lost the cardiac murmur, whereas this happened in only 20 per cent. of the non-clinic cases. These latter murmurs were probably in the majority of instances due to myocarditis.

This benefit from attendance at the clinic would seem, however, to be more apparent than real as it is completely counterbalanced by the behaviour of the cardiac condition when related to the regularity of attendance. In Table 4 it is seen that the proportion of cases which improved is highest in those who attended least regularly and that the proportion of those who deteriorated was highest among those who attended best.

TABLE 4.
SHOWING PROGRESS OF CARDIAC DISEASE IN CLINIC CASES ACCORDING TO REGULARITY OF ATTENDANCE (1924—1928).

Group	No. of cases.	Progress
Good attendance	45	improved 4=9% I.S.Q. 35=78% deteriorated 6=13%
Fair attendance	12	improved 3=25% I.S.Q. 8=66% deteriorated 1=9%
Bad attendance	23	improved 4=17% I.S.Q. 18=78% deteriorated 1=4%

Thus from a review of the progress of events during the period of the child's attendance at the clinic there is little evidence that any great benefit was obtained. Recurrences of infection, at least so far as the arthritic and choreic manifestations are concerned, were in no way prevented and the evidence of the slightly lower incidence of cardiac disease developing among the clinic than in the non-clinic cases was neutralised by the evidence of most satisfactory progress being observed among those children whose attendance at the clinic was least satisfactory. It may be of course that attendance at the clinic was in great part dependent on the necessity of the child for treatment, *i.e.*, so long as the child kept well the parents, not seeing any need for medical advice, did not attend and in fact only did so when a recurrence of the mischief ensued or when the child's cardiac condition was deteriorating and causing increasing embarrassment.

Let us now consider the progress of these cases transferred to the Cardiac Hospital in the country. The hospital is situated about 7 miles beyond the city boundaries and is built in pavilion style. The education authorities have put at our disposal a mistress who visits daily and gives instruction to those children who are considered well enough to benefit from it. Here, as we have remarked, there are facilities for accommodating only 12 children and as it is just a year since the beds were available the material for analysis is small. During the year, however, there have been under observation 14 children with an average residence of 40·5 weeks per child. Only one patient has presented during the year any active rheumatic manifestation, namely, a recurrence of chorea. Otherwise the children have been remarkably well and most of them

have proceeded with their education. It would of course be ridiculous to express arithmetically the facts relative to this small series, but it may be said that the incidence rate of rheumatic manifestations is only half of that which prevailed among the children attending the out-patient clinic at the Hospital, so that by this means some benefit would seem to have been obtained. Records from a similar institution in connection with St. Louis Children's Hospital³, U.S.A., which has been in operation for two years, also reveal a less incidence of attacks during residence, but unfortunately after their return home a greater incidence than occurred among children who had never been absent at all from their homes. It would seem as if in consequence of their removal to healthier surroundings the children had lost a certain amount of their immunity and become more susceptible to the disease.

Such then is the record of our attempt to control the ravages of the rheumatic infection and it must be admitted that it does not engender a feeling of optimism. We can only conclude that the cardiac clinic—at least as an out-patient department—is of very little if any avail, and even the cardiac hospital in the country, unless perhaps as a permanent residence, would seem to be little more effective. In any case most people will agree that the results are not commensurate with the energy expended, and certainly fall short of what would have been anticipated.

It may be suggested in criticism that we could not expect more when we select cases in which the disease is well advanced and it will be recommended that we concentrate on what is called the pre-rheumatic child. But we ask, how can we recognize him? To us there is nothing more nebulous in medicine than what is spoken of as the pre-state of a disease. We know that the descendants of a rheumatic stock are specially susceptible to the infection, just as we know that the descendants of a stock with examples of muscular dystrophy are specially liable to the development of this disease, but how can we recognize the individual who is going to contract rheumatism or whose muscles are to degenerate prematurely? The pre-state, just as the so-called diathesis, is an early or mild form of that disease. By all means let us try and discover the earliest manifestation of the malady so that we may as soon as possible be on the defensive, but let us not make the clinical picture of this early phase so all-embracing as to make the whole world suspect.

If, however, it would seem impossible either to cure or control the disease when it has appeared, is it possible to prevent it? The moral of our experience in Glasgow is we believe to concentrate on prophylaxis. Although we do not know the cause of the disease, we do know that it exacts its toll from the poorer classes of the community, and that the housing conditions of these rheumatic families is often most insanitary. They are damp and low lying and sunless. The almost complete immunity of the same class of child when resident under good conditions in the London County Council orphan homes, and the comparative immunity of the better classes, admit of no other conclusion than that at present change of environment is our chief weapon. The experience of Drs. McCulloch and Irvine-Jones that after a temporary improvement in environment the susceptibility of the individual becomes increased would

indicate that this change of environment, however, should be a permanent one. This spells nothing short of housing reform. The sequelæ of rheumatic fever are fast usurping the place held by tuberculosis in the past among the chief causes of death, and the lessons of our work in Glasgow in an attempt to fight rheumatism are a further incentive, if any were needed, to the provision of healthy homes for the poorer classes of the community.

CONCLUSIONS.

1. Regular supervision at a cardiac or rheumatism out-patient clinic does not seem to diminish the recurrences of the rheumatic infection.
2. Regular supervision at a cardiac or rheumatism out-patient clinic does not seem to affect markedly the progress of rheumatic heart disease.
3. Residence in the country under medical supervision does seem to control the rheumatic infection.
4. As the rheumatic infection cannot be controlled to any great extent chief attention should be directed to prophylaxis.
5. Modification of environment is at present our chief prophylactic weapon and means provision of healthy homes for the poorer classes of the community.

REFERENCES.

1. St. Lawrence, W., *J. Amer. Med. Assoc.*, Chic., 1922, LXXVIII, 947.
2. Medical Research Council, Special Report Series, Lond., 1927, No. 114.
3. McCulloch, H., and Irvine-Jones, E. I. M., *Amer. J. Dis. Child.*, Chic., 1928, XXXVI, 397.