RHEUMATIC FEVER IN THE R.A.F. RESULTS OF TREATMENT AT A CONVALESCENT CENTRE

BY

H. STUART BARBER, M.D., F.R.C.P.I.*Late Wing Commander; Officer in Charge of a Medical Division*

In a comparatively recent survey of the trends in the incidence of rheumatic fever Glover (1943) presented figures showing a remarkable decline in the disease since the beginning of the century, to the extent of inducing him to refer to it as an "obsolescent" disease. Nevertheless, in large communities of young adults such as are to be found under conditions of military service rheumatic fever still provides a problem of some magnitude. Before the late war the frequency of the disease among the boys and youths in the training establishments of the Royal Navy and in the apprentice schools of the Royal Air Force had been a matter of concern to the respective medical directorates. In the Air Force the boys enter the apprentice schools at the age of 15 to 16 years, to undergo an expensive course of training lasting three years. Applications to enter the schools have always exceeded the number of vacancies, and the boys are selected by a competitive examination. In consequence of rheumatic fever not only was there a steady and persistent loss of potential craftsmen upon whom a considerable amount of public money had been spent, but in many cases a promising career was ruined. While a certain wastage was to be expected, it was felt that if these cases could be given the necessarily protracted convalescence under Air Force auspices a high proportion might again become fit for service. Shortly after the outbreak of war it was therefore proposed to establish a convalescent centre for cases of rheumatic fever, and early in 1940 some twenty beds were set aside for this purpose in one of the Royal Air Force general hospitals. To ensure that only those cases which would benefit from such treatment were admitted, all patients had to be recommended for transfer by one of the Air Force consultants in medicine. A few acute cases were admitted direct from neighbouring units served by the hospital. It was soon found necessary to increase the number of beds at the centre, as, in addition to the apprentices, convalescent cases from among the regular Air Force personnel came to be included. Towards the close of 1940 it was decided to move the centre to another hospital, where it continued for a further nine months. Both because of a greater number of beds and because the demands upon the consultants in medicine did not permit of their making individual recommendations, patients suffering from various forms of chronic rheumatism were also treated.

The principal consideration in the treatment was an adequate period of rest followed by a graduated return to activity as the condition, gauged by the temperature, pulse rate, and erythrocyte sedimentation rate, showed improvement. The sedimentation rate was taken at weekly intervals, and when there was a doubt regarding the size and configuration of the heart this was checked radiologically. An electrocardiograph was not available for use in all R.A.F. hospitals in the early years of the war, and it was not possible to make serial tracings. As soon as the rate of progress permitted, occupational therapy was encouraged. No complications were encountered, and, despite occasional retrogression after infections of the upper respiratory tract, no true relapses occurred.

The system of medical records in the Air Force makes a follow-up of such patients a relatively easy matter. In 1945, four years after the centre had closed, in view of the interest concerning the ultimate progress of these cases and to make some assessment of the value of the centre, such a follow-up was initiated. Sixty-five airmen convalescent from acute rheumatic fever had been treated. The majority were in their teens, and the average period of detention in hospital was 149 days. Of the original number admitted it was considered advisable to invalid eight out of the Service, of whom four had developed mitral stenosis and four aortic incompetence. The remaining 57 were retained in the Service, but owing to errors in numbers or names it was found possible to trace only 48 of these. At the time of their return to duty 28 showed signs of minor cardiac involvement by soft apical or basal systolic murmurs.

The remainder appeared to be fully recovered. On returning to duty all were lowered in medical category, and were subject to three-monthly examination by a medical specialist until they were considered fit to return to a full category. When the medical documents were seen in 1945 it was found that out of 48 men 34 had been recategorized to Grade 1, and of these two had been accepted for air-crew duties, in which the physical standards are extremely high. Ten men had been retained in Grade 3, and four had been invalided out of the Service—two on account of mitral stenosis and two because of aortic incompetence. The after-history of these men disclosed little of interest, with one exception. Four patients developed symptoms of a psychoneurotic nature and were noted at later examinations to have a nervous tachycardia or effort syndrome. An incidence of from 6 to 8% showing such symptoms seems unduly high, and gives rise to some doubt regarding the wisdom of frequent examinations. A similar state of affairs was observed in some of another group of patients coming for three-monthly review of their chests because of the finding of opacities of doubtful significance on mass radiography. In suspected phthisis, and after diseases like rheumatic fever, it is a difficult matter to strike a nice balance between adequate observation and the liability of inducing a neurosis by too much attention to the chest or heart. In defence it may be argued that the seed flourishes only in fertile ground, that at a later date the psychoneurosis would have manifested itself in other ways for other reasons, and that the advantages of adequate after-care outweigh such possible complications. In this connexion it is of interest to refer to a study made on the cases of chronic "rheumatism" admitted to the centre in the later stages (Flind and Barber, 1945). It was found that a high percentage were suffering from one or another of the common neuroses and had shown a clear predisposition to neurosis from an early age. In an attempt to obtain a control group a psychiatric assessment was also made on some of the convalescent rheumatic fever patients. Unfortunately the decision to terminate the rheumatic centre, and a marked decrease in the number of these patients, made this group from a statistical point of view valueless, but in the 15 patients studied no evidence of a psychoneurosis was found. The only other point of interest is the small number who had a further attack of rheumatic fever. Only two were again treated in hospital on this account.

The majority of observers are agreed that rheumatic fever is closely related to infections of the upper respiratory tract, in particular by the haemolytic streptococcus. How this association plays its part in the onset of the attack of rheumatic fever is not clear, but, despite the strictures of Aschoff (1935) regarding an allergic factor, there is a distinct tendency to view at least the joint manifestations as being of this nature. To some extent this hypothesis is supported by the occasional appearance of joint involvement similar in most respects to that of rheumatic fever in poliomyelitis (Poynton, 1943) and in tuberculosis (Sheldon, 1946). On the other hand, the heart lesions would seem to be due to a direct infection of the valves by the haemolytic streptococcus; for Green (1939), Collis (1939), and Thomson and Innes (1940) reported success in culturing these organisms from the heart valves in about half their necropsies on cases of rheumatic fever dying in the acute phase. The importance of infections of the upper respiratory tract was stressed by Bradley (1934), who considers that the precursor pharyngitis is an essential part of the rheumatic state, though it may be concealed under the guise of the common cold. In a later communication Bradley (1938) remarks that the spread of infection is intensified by the simultaneous presence or previous occurrence of other catarrhal diseases. Similarly, Green (1942) states that the increase of acute rheumatic fever in winter is due to the prevalence of respiratory infections and not to any climatic influence by itself. He suggests an enhanced virulence of the infecting organism as a result of passage through a community. Recently Glover (1946) has again emphasized this. At the appropriate season the carrier rate of one particular strain of streptococcus rises and is followed by an epidemic of acute tonsillitis and a little later by cases of acute rheumatism in the ratio of about one to every ten of acute tonsillitis. The question of susceptibility of certain classes of the population, particularly in the lower-income groups, is also thought to be of importance. Green (1942), in observations on epidemics in the training establishments of the

Royal Navy, noted a higher incidence among boys coming from Tyneside, at that time designated a "distressed area." Poynton (1938), however, remarks that the apparently higher incidence among the poorer classes compared with the well-to-do may be a matter of relative numbers, and that the percentage incidence is probably the same. This is not a view generally held, and Keith (1941) mentions the economic status as one of the fundamental causes, while Glover (1943) ascribes the war-time decrease of acute rheumatism to abundant employment and the greatly increased provision of school milk and meals for the children. It should be possible to elucidate this important point, though it is not unreasonable to suggest that overcrowding, poor hygiene, and inadequate diet will at least predispose to upper respiratory infections and, in susceptible individuals, to subsequent rheumatic fever. Under Service conditions, however, the hygiene and diet are of a high order, even if overcrowding takes place at times. In peacetime overcrowding did not take place in the R.A.F. apprentice schools, where spacing in the barracks was carefully controlled. In these centres the important factors would appear to be a community of young adults undergoing military training, with its stress on hardihood in all kinds of climatic conditions, plus a constant addition of new arrivals susceptible to strains of the infecting organism, against which the older members have gained an immunity.

At the time of the inception of the rheumatic centre the full importance of the precursive upper respiratory infection was not realized and consequently no inquiry into this was made. When the medical documents were examined in 1945 a note was made of any containing an entry for tonsillitis or nasopharyngitis. In 14 of the 48 cases traced there was recorded an admission to either the sick quarters or the hospital for an upper respiratory infection within four weeks before the onset of the rheumatic symptoms. Of these, four were diagnosed as tonsillitis and ten as nasopharyngitis. The interval between the two illnesses varied from five to eighteen days. The only entries recorded in the medical history are admissions to hospital exceeding 48 hours in duration, specialist reports, and medical boards. It can therefore be safely assumed that a certain proportion of the remainder also had milder infections of this nature, for which they may have reported sick but were not ill enough to require admission to hospital.

The incidence of rheumatic fever in the Royal Air Force as a whole in 1940 was 2.1 per 1,000, whereas among the boy entrants and apprentices it was 10.4 per 1,000 for the same period. In one epidemic in a Naval training establishment the attack rate was 63 per 1,000 (Green, 1942). It is therefore of paramount importance that adequate methods of prevention should be instituted. In the armed Forces of the United States one suggested solution was the rejection of all recruits giving a past history of rheumatic fever (Master, 1943, 1944; Holbrook, 1944). This measure would hardly suffice, for among the 65 patients treated in the R.A.F. rheumatic centre only two gave a past history of rheumatic fever, and in one of these that attack had occurred in the Service. The apprentices, too, are of an age when primary attacks may be expected. Tonsillectomy is regarded as being of no value (Keith, 1941), and Bradley (1932) goes so far as to describe it as a lost cause in the prevention of rheumatic fever. A way of preventing the precursive respiratory infections seemed a more hopeful alternative, and the sulphonamides offered a possible means to this end. Accordingly, at camps of the United States Army and Navy large-scale observations were made on the value of the prophylactic use of the sulphonamide compounds in the prevention of such infections and on the effect of the prevention on the incidence of rheumatic fever. The results came fully up to expectations. In the Army Air Force there was a reduction of 50 to 70% in the incidence of respiratory and streptococcal infections after the prophylactic administration of from 0.5 to 2 g. of sulphadiazine daily to each man (Holbrook, 1944). It was found that a reduction in the attack rate of acute rheumatic fever ran parallel with the reduction in respiratory diseases. A similar finding was reported by Coburn (1944) after the use of sulphonamides in the United States Navy. A small percentage of the men showed an idiosyncrasy to sulphonamides in prophylactic doses, but as the incidence was 1 in 10,000 it was concluded that the advantages far outweighed any risk entailed. There was no evidence either of

the development of sulphadiazine-resistant strains of bacteria or of mass sensitivity to the drug on the part of the subjects of the experiment. These findings suggest a promising form of defence against rheumatic fever, and might with advantage be given a trial in some of the British training centres. From the results obtained with the rheumatic centre it may be considered that it justified its existence, and that in the event of further outbreaks of rheumatic fever it might be revived.

Summary

A centre for convalescent cases of rheumatic fever in the Royal Air Force, and the results of treatment at the centre, are described.

The relationship between the upper respiratory tract infections and rheumatic fever, with a method of prophylaxis tried in the armed Forces of the United States, is discussed.

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ERYTHROBLASTOSIS FOETALIS

BY

MARGARET VENTERS, M.B., Ch.B., M.R.C.O.G.,
M.M.S.A., L.M.

Erythroblastosis foetalis is not an exceedingly rare disease, but it appears to be uncommon enough to make the following case worth recording.

Case Report

Mrs. E., aged 33, was first seen in December, 1944, when she was 23 weeks pregnant. This was her sixth pregnancy, and she had no living child. Her obstetric history was as follows:

First Pregnancy, 1934.—Full term. Normal confinement and delivery. Child died from pneumonia when 9 months old.

Second Pregnancy, 1936.—Full term. Normal confinement and delivery. Mother told that the child was jaundiced at birth; it died nine days later.

Third Pregnancy, 1937.—Patient had eclampsia. Child stillborn.

Fourth Pregnancy, 1940.—Patient admitted to hospital three weeks before term with oedema of feet, which subsided within 24 hours of admission. She was told that she had no rise of blood pressure and that her urine was normal, but she was kept in hospital in view of her previous history. Foetal movements ceased two weeks later for no apparent reason, and she was delivered at term of a stillborn macerated foetus.

Fifth Pregnancy, 1943.—Aborted at three months.

The patient was a healthy well-nourished woman; her Wassermann reaction was negative. It was thought most probable that her second child had died of erythroblastosis, but her blood was not tested for the Rh factor owing to some difficulty in getting the test done at that time. The antenatal period was uneventful. It was decided to induce labour at 38 weeks, or earlier if any signs of toxæmia developed, and with this in view she was given stilboestrol dipropionate daily from 36 weeks onwards. The patient went into labour on the morning of the day on which she was to have come into hospital for induction, and had a rapid, almost precipitate, delivery. When the membranes ruptured it was noticed that the liquor was of a dirty brown colour. The child was slightly premature in appearance, weighed 6 lb. 6 oz. (2.9 kg.), and was slightly jaundiced, but his general condition was quite good. Six hours after delivery the jaundice was considerably deeper; the child was very fretful and did not appear to be at all well. As his condition was