MEDICAL AND SOCIAL ASPECTS OF THE TREATMENT OF RHEUMATOID ARTHRITIS WITH SPECIAL REFERENCE TO FACTORS AFFECTING PROGNOSIS

BY

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The hope that the problems of long-term treatment of rheumatoid arthritis had been solved by the discovery of the remarkable therapeutic effects of cortisone and ACTH has not been fulfilled. It would appear that in only a relatively small proportion of patients can symptoms be satisfactorily controlled over a long period without side-effects or complications (West and Newns, 1953). In the majority, reliance still has to be placed on the combination of local and general measures which experience has shown to be reasonably effective in maintaining function and preventing deformity. There is a serious danger at the present time that excessive interest in the therapeutic possibilities of new drugs or hormones may lead to a neglect of sound basic principles in the treatment of rheumatoid arthritis.

Few attempts have been made in the past to study the effect of a combination of medical and orthopaedic measures applied over a period of years. Accurate information on the value of such treatment is essential before the relative merits of new remedies can be assessed. Short and Bauer (1948) followed a group of 250 patients, treated on simple lines, for an average period of $9\frac{1}{2}$ years; at the time of review 53.2 per cent. had improved, 12.8 per cent. had remained the same, and 34 per cent. had deteriorated; 15.2 per cent. of those who had improved were considered to be in complete remission. Ragan (1949) carried out a similar study on a group of 374 patients treated by a variety of methods, or not treated at all, and followed for an average period of 11 years. In his series, 48 per cent. had improved substantially, but in the other 52 per cent. the end result was poor. It would appear that, whatever form of treatment is applied, about 50 per cent. of patients suffering from rheumatoid arthritis will improve and 50 per cent. will do badly. It is against this background that the value of new

methods must be judged. Although there is general agreement on the fundamental principles which should govern the treatment of rheumatoid arthritis, the application of these principles has been rendered difficult in the past by lack of hospital accommodation and adequate facilities. Doubts have been felt by many about the advisability of providing such accommodation in view of the heavy expense involved and the lack of clear proof that the course of the disease can be materially altered for the better.

The present study was designed to answer this question. Its immediate objects were:

- (1) To reach an accurate assessment of the immediate results of treatment in hospital of patients with rheumatoid arthritis, as measured by changes in functional capacity and the activity of the disease process.

- (2) To ascertain how long any improvement following hospital treatment could be maintained by adequate medical and social after-care.

- (3) To estimate the extent of any changes in social and economic status following treatment and to determine the relationship of such changes to medical progress.

- (4) To obtain information regarding factors which might be of significance in predicting the response to treatment of the individual patient.

Composition of the Group

The group for study consisted of all patients suffering from rheumatoid arthritis admitted to the Rheumatic Unit, Northern General Hospital, Edinburgh, between June, 1948, and July, 1951. All were considered to be in need of in-patient treatment, either because of active disease or the presence of deformities requiring correction. The original group totalled 307 patients. Fifteen patients had died since discharge, eight had left Scotland, and two failed to attend at follow-up, leaving 282 available for examination and assess-

ment. Basic information on these patients is given in Table I. Causes of death amongst the original group will be considered later.

TABLE I
BASIC INFORMATION ON 282 PATIENTS

Sex	Male	Female
Mean Age at Onset of Disease (yrs) ..	44.6	43.5
Mean Duration of Disease (yrs) ..	6.0	7.3
Mean Age on Admission (yrs) ..	50.6	50.5
Mean Duration of Hospital Treatment (wks) ..	10.0	8.9
Mean Period of Follow-up (mths) ..	24.4	24.4
Total No. of Patients ..	77 (27.3%)	205 (72.7%)

Age at Onset.—The mean age at the onset of the disease was 44.6 years in males and 43.5 years in females. The mean age at onset in a large series studied under the auspices of the Empire Rheumatism Council (E.R.C., 1950) was 42 years in males and 41 years in females.

Sex Incidence.—The ratio of females to males in this series was 2.7 : 1. This is comparable with that reported by other workers (E.R.C., 1950; Ragan, 1949).

Duration of Disease.—The mean duration of the disease up to the time of admission to hospital was 6 years in males and 7.3 years in females. It is of interest, however, to compare in more detail the duration of the disease before admission in males and females (Fig. 1). It will be seen that 30 per cent. of males were admitted within 6 months of the onset in contrast to 18 per cent. of females. Between 6 months and 5 years there is little difference between

Fig. 1.—Duration of disease before admission to hospital, by sex.

the sexes, but in cases of 5 years' duration and over on first admission, there is a greater proportion of females (females 44.4 per cent., males 32.5 per cent.).

Duration of Treatment in Hospital.—The average stay in hospital was 9 to 10 weeks, but the length of time ranged from 2 to 35 weeks. In the case of those patients severely crippled before admission the processes of correcting deformities in weight-bearing joints and restoring muscular control and stability often took many weeks.

Duration of Follow-up.—The minimum period since discharge from hospital was 12 months; the maximum interval was 50 months, with a mean interval of 24.4 months. It is intended to continue this study, and the present communication only embodies the results of the first stage. Further review of these patients will be essential before any definite conclusions can be drawn regarding the ultimate value of hospital treatment followed by long-term medical and social care.

Previous Treatment.—67 patients (23.8 per cent.) had already received treatment as in-patients in other hospitals on account of rheumatoid arthritis, sixteen having been admitted on more than one occasion.

119 patients (42 per cent.) had been treated with gold on one or more occasions before admission. Benefit had been temporary in the majority of cases.

35 patients (12.4 per cent. of the group of 282) required re-admission to the rheumatic unit after their initial period as in-patients. These re-admissions were necessitated by exacerbations of disease activity reported at the follow-up clinic.

Distribution of Affected Joints.—At the time of admission the disease was confined to the peripheral joints (hands, feet, wrists, and ankles) in nineteen cases; and to the central joints (shoulders, elbows, hips and knees) only in four cases. In the remaining 259 patients both peripheral and central joints were involved. Distribution was symmetrical in 46 per cent. of males and 52.3 per cent. of females.

Course of Disease.—The patients were divided into three groups in accordance with the type of course run by the disease up to the time of admission to hospital:

- (1) A slowly progressive course without significant remissions.
- (2) A course of exacerbations interspersed with apparent remissions in activity of the disease.
- (3) A rapidly progressive course with marked systemic disturbance and without significant remissions.

There was no marked difference between males and females in this respect; 40 per cent. of males and 46 per cent. of females had run a course of exacerbation and remission; 22 per cent. of males and 14 per cent. of females had run a rapidly progressive course. In the remainder of both sexes the disease had been slowly progressive without significant remission.

When the type of course was considered in relation to the age at onset (Fig. 2), it was found that a rapidly progressive course was more common in the older age groups, particularly when the disease had started in persons over 60 years old, and that as the age at onset advanced, the frequency of the type characterized by exacerbations and remissions decreased.

Fig. 2.—Relationship between type of course of disease and age at onset in 282 patients.

Deaths.—Between admission to hospital and the last follow-up examination, fifteen of the original 307 patients had died. The causes of death were as follows:

Malignant disease	..	..	4
Cardiovascular disease	..	..	5
Ulcerative colitis	..	..	2
Infective hepatitis	..	..	1
Fractured femur and pneumonia	..	..	1
Post-gastrectomy	..	..	2

The causes of death were not remarkable, although the occurrence of two deaths from ulcerative colitis in such a small series may be significant. None of the deaths could be related to the rheumatoid disease.

Co-existent Diseases.—The most common complicating conditions found affected the eyes or the skin. Signs of present or past disease of the eyes were present in 36 patients (12.8 per cent.). In

another fourteen (5 per cent.) a diagnosis of psoriasis was made. Dermatitis was present in seven. As might be expected from the age distribution of patients in this group, signs of disease other than rheumatoid arthritis were relatively common, but in only fifteen cases was it considered that the complicating condition had materially interfered with the patient's progress. The nature of the disease in these patients was as follows:

Cardiovascular	..	..	9
Effects of old injury	..	..	2
Chronic nephritis	..	..	1
Carcinoma	..	..	1
Menorrhagia and anaemia	..	..	1
Perthe's disease	..	..	1

Psychological Factors.—In view of the widely-held opinion that psychological strain or emotional shock may be a factor in precipitating rheumatoid arthritis, special note was made of the incidence of such conditions. In only eleven patients (4 per cent.) in the present group was any history obtained of emotional stress immediately preceding the onset of arthritis. In 77 patients (27 per cent.) a history was obtained suggestive of psychological illness without a clear relationship to the onset of arthritis. This figure is not unduly high when compared with the incidence in the general hospital population. The Empire Rheumatism Council (1950) states that 25 per cent. of controls and 25 per cent. of cases of rheumatoid arthritis gave a history of some emotional disturbance within 2 years of onset.

From the data presented, it would appear that the group studied represents a reasonable cross-section of the rheumatoid population and that inferences drawn from the results of hospital treatment and after-care may provide a fairly reliable guide as to what can be expected from this regime.

Basic Regime in Hospital

The general principles of the basic regime employed have already been described in detail (Duthie, 1951). In the belief that all sufferers from rheumatoid arthritis will benefit from a period of rest, all patients spent a minimum of 2 weeks in bed after admission. During this period of rest, daily maintenance exercises were used to prevent unnecessary deterioration in the patient's general physical condition. Skin-tight plaster-of-paris splints were used to immobilize affected joints until the acute symptoms had subsided. Full doses of aspirin were prescribed. Local heat was applied to painful joints, but active exercises were deferred until signs of acute inflammation had begun to subside. The duration of this initial period of rest varied in individual patients, depending on the degree of activity of the disease. A fall in erythrocyte sedimentation rate, a gain in weight,

and an increased feeling of general well-being were regarded as indications that more active forms of treatment could safely be applied.

The second phase of treatment consisted of intensive efforts to restore joint stability by active and resisted exercises. No weight-bearing was allowed until this objective had been achieved in some measure at least.

The third phase aimed at restoring endurance and stamina by a progressive increase in weight-bearing, occupational therapy, and simple games.

Progress was graduated in accordance with age, disease activity, and the degree of residual damage in the affected joints. Gold was used in only 22 patients (7.8 per cent.) who failed to show a satisfactory response after a reasonable period on the basic regime. It should be borne in mind, however, that 42 per cent. of the patients in the group had already received one or more courses of gold before their present admission to hospital. Intravenous iron was used in 34 per cent. of cases on account of anaemia. It has been shown that, although the hypochromic, normocytic anaemia which is a constant feature of the active phases of rheumatoid arthritis is resistant to the administration of iron by mouth, a significant number of patients respond when iron is given by the intravenous route (Sinclair and Duthie, 1949, 1950; Ross, 1950; Jeffrey, 1952, 1953).

After-Care

Before discharge from hospital, patients were given detailed instruction in the use of simple home physiotherapy and remedial exercises. The importance of rest periods during the day and of wearing splints at night was emphasized. The role of the medical social worker in helping patients to regain social and economic stability will be discussed in detail later. Every patient was seen regularly at the follow-up clinic, and failures to report were investigated by letter or home visit. Fifty patients (17.7 per cent.) received further physiotherapy as out-patients. Splints were adjusted or new ones supplied when the need arose.

Methods of Assessment

Disease Activity.—This was assessed in the three grades shown in Table II; patients were grouped in these grades on admission to hospital, on discharge, and at the last follow-up examination.

Functional Capacity.—Four grades were used (Table III); patients were classified on admission, on discharge, and at follow-up. Functional capacity on admission was assessed on the basis of the patient's level of physical activity during the preceding 3 months.

TABLE III
GRADES OF FUNCTIONAL CAPACITY

Grade	Definition	Remarks
I	Fit for all normal activities	Full employment in usual work. Full house duties
II	Moderate restriction	Usual employment with modifications. Light or part-time work. All housework save the heaviest. No dependency on others
III	Marked restriction	Only very light work or light housework. Some degree of dependency on others
IV	Confined to chair or bed	Not capable of any work. Completely dependent on others

Clinical Progress.—At the final examination the clinical progress since admission to hospital was assessed under five headings:

Marked improvement
Moderate improvement
No change
Moderate deterioration
Marked deterioration

For the sake of uniformity, all the final medical examinations were conducted by a single observer (M.T.).

Social Factors.—Each patient was interviewed by the medical social worker (M.M.W.) on admission, on discharge, and at follow-up. The following factors were considered:

Social category (Registrar-General)
Employment
Income level
Housing conditions
Domestic needs
Family background

All adjustments of adverse social or economic circumstances during the stay in hospital and after discharge were noted. At the final review the improvement or deterioration of the patient's social circumstances was assessed.

TABLE II
GRADES OF DISEASE ACTIVITY

Grade	Degree of Activity	Blood Sedimentation Rate (mm./hr)	Haemoglobin (per cent.)	Joint Involvement	Systemic Disturbance
1	Very active	Over 60	65 or under	Signs of acute inflammation in many joints	Marked, with loss of weight
2	Moderately active	20–60	65–85	Signs of activity in several joints	Moderate, weight steady
3	Inactive	20 or under	85 or over	No symptoms due to inflammation in the joints	None

Results

Functional Capacity.—The distribution of patients over the four grades on admission, on discharge, and at follow-up is shown in Fig. 3. On admission 62 (22.0 per cent.) were confined to bed and 120 (42.6 per cent.) markedly incapacitated; these two grades accounted for 64.6 per cent. of the whole group. On discharge the proportion in Grades III and IV fell

to 24.5 per cent. and only one patient was still bedridden, but at follow-up an additional six patients had relapsed to the bedridden level. On admission no patients were placed in Grade I, but at the time of discharge 32 (11.3 per cent.) were so graded; at follow-up the number in Grade I had increased to eighty (28.4 per cent.), and 72.4 per cent. of patients were placed in Grades I or II. More detailed analysis

of the data on discharge showed that 136 patients had improved sufficiently to justify their advance by one grade and that 34 had advanced by two or more grades. At the final review one hundred cases had advanced by one grade and seventy had moved up two or more grades. The fall by 36 of those improving by one grade and the increase by 36 in those improving by two or more grades indicates that substantial further improvement in functional capacity had taken place in 36 patients between discharge and follow-up. When the degree of improvement between discharge and follow-up was tested for statistical significance, the increase in functional capacity was shown to be highly significant ($\chi^2 = 31.8$ with 2 d.f. $P < 0.001$).

The number of patients who had improved sufficiently in functional capacity to justify moving them up one or more grades at the last follow-up examination totalled 170 (60.3 per cent.).

Disease Activity.—The changes in disease activity between admission, discharge, and final follow-up are shown in Fig. 4. Between admission and discharge there was a marked decrease. Those graded "very active" dropped from 26.2 to 5.0 per cent., and the proportion classed as "inactive" rose from 10.3 to 35.8 per cent. There was no significant increase in disease activity between discharge and follow-up.

Fig. 3.—Grades of functional capacity before and after hospitalization.

Fig. 4.—Grades of disease activity before and after hospitalization.

The relationship between disease activity and functional capacity was subjected to statistical analysis. On admission there was a close correlation between them. A χ^2 test showed a value for χ^2 of 18.2; $P < 0.001$. As would be expected, the number of very active cases was significantly greater in the group with the most severe functional incapacity.

On discharge the correlation was not significant ($\chi^2 = 2.6$; $0.4 > P > 0.3$). The decrease in disease activity was more marked than the gain in functional capacity. Both had improved, but not equally.

At follow-up, however, the close relationship between the two had been re-established ($\chi^2 = 19.64$ $P < 0.001$).

These figures indicate that the activity of the disease process, as judged by the standards adopted, can be substantially reduced by treatment in hospital. This reduction can apparently be maintained in the majority of patients for a reasonable length of time after discharge. Functional capacity continues to

improve in a significant number of patients in the months following discharge, although the disease activity remains at about the same level.

Clinical Progress.—The results of the general assessment of clinical progress are shown in Fig. 5. This type of assessment is largely influenced by the impressions of the examining physician and the opinions expressed by patients at follow-up. 70.5 per cent. of patients were graded as moderately or markedly improved (males 76.7 per cent., females 68.3 per cent.), but it will be recalled that only 60.3 per cent. had improved sufficiently to justify moving them up one or more grades in functional capacity. The difference between these figures may be accounted for by the fact that there is considerable room for improvement in both symptoms and physical signs within each grade of functional capacity, but in about 10 per cent. of cases this was insufficient to justify up-grading. The assessment of progress in terms of functional capacity represents a more objective measure of improvement and is to be preferred in any realistic attempt to evaluate the results of treatment.

Capacity for Work.—Although a diminution in the activity of the disease process and improvement in functional capacity are valuable in themselves and may do much to restore personal independence, the process of rehabilitation must include the restoration to economic independence in cases where this is a practical possibility. Of 282 patients, 171 were housewives, eleven had retired, 23 had given up work because of marked degrees of incapacity, one was a schoolchild, and 76 had been in gainful employment within the year preceding admission. Only in these 76 cases was it possible to assess the direct effect of treatment in hospital on capacity for work. These patients were classified in four groups in accordance with their capacity for work on admission and at follow-up (Table IV, opposite):

- (1) Fit for normal employment.
- (2) Fit for light work.
- (3) Unfit for work.
- (4) Fit but unemployed.

Only four of the 76 patients were considered fit for normal employment on admission. At follow-up, 29 were employed full-time under normal conditions, 33 were employed in light work, and only fourteen remained without employment. Of these, five

Fig. 5.—General assessment of clinical progress, by sex.

TABLE IV
CAPACITY FOR WORK IN 76 CASES

Capacity for Work	On Admission		At Follow-up	
	No.	%	No.	%
(1) Normal Employment	4	5.3	29	38.2
(2) Light Work	14	18.4	33	43.4
(3) Nil	58	76.3	9	11.8
(4) Fit but Unemployed	0	—	5	6.6
TOTAL	76	100	76	100

were considered fit for some form of work, but had been unable to find a suitable job.

The 171 housewives' capacity for work in the home was assessed in four categories on admission, on discharge from hospital, and at follow-up (Table V):

- (1) Fit for all housework.
- (2) Fit for all but the heaviest tasks (e.g. scrubbing floors, heavy washing, etc.).
- (3) Fit only for light duties.
- (4) Unfit for housework in any form.

TABLE V
HOUSEWIVES' CAPACITY FOR HOUSEWORK

Fitness for Work	On Admission		On Discharge		At Follow-up	
	No.	%	No.	%	No.	%
(1) All work	0	—	5	2.9	27	15.8
(2) All duties save the heaviest	15	8.8	71	41.5	78	45.6
(3) Light housework only	87	50.9	83	48.6	47	27.5
(4) Nil	69	40.3	12	7.0	19	11.1
TOTAL	171	100	171	100	171	100

On admission 40.3 per cent. had been placed in Category 4, and the proportion in this grade had diminished to 11.1 per cent. at follow-up. The proportion fit for all but the heaviest duties rose from 8.8 on admission to 45.6 per cent. at follow-up; 61.4 per cent. were in Categories 1 and 2 at follow-up, 15.8 per cent. being fit for all household duties.

It would then appear that there is good correlation between the medical assessment of functional capacity and actual fitness for work in those groups of patients where this can be checked with reasonable accuracy.

Social and Economic Factors

Rheumatoid arthritis is an incurable condition. Although medical treatment can reduce the activity

of the disease and improve functional capacity, only a relatively small proportion of patients become free from symptoms and are left without residual disability. The majority have to accept some restriction of their activities and adjust their lives accordingly. The process of adaptation to a reduction in physical capacity forms an integral part of the rehabilitation of these patients. It is in this connection that social and economic factors assume great importance. These were investigated in detail by the medical social worker in every case. A wide variety of factors can exercise an adverse effect on rehabilitation and only an analysis on broad lines is possible. Difficulties may arise in connection with continued medical care, domestic arrangements, employment, personal relationships, finance, and housing. The incidence of such factors in the group is shown in Table VI. Only eighteen patients required no assistance from the medical social worker. In the remaining 264, help was given on 651 occasions, an average of 2.46 items of service for each patient.

TABLE VI
ADVERSE SOCIAL CIRCUMSTANCES IN 282 PATIENTS

No.	Definition	No.	%
I	Nursing and Medical	165	24.8
II	Domestic	106	15.9
III	Employment	80	12.0
IV	Personal	69	10.3
V	Marital and Family	62	9.3
VI	Financial	50	7.5
VII	Environmental	35	5.2
VIII	Miscellaneous	100	15.0
TOTAL		667	100.0

At the final review an improvement in social circumstances was seen in 74.1 per cent.; in 19.1 per cent. there was no change; in 6.8 per cent. (nineteen patients) there had been some deterioration. The influences leading to this deterioration in these nineteen patients fell under the following heads:

Medical	12
Psychological	5
Environmental	1
Industrial	1

There was a close correlation between medical and social improvement. Only four patients whose arthritis showed moderate or marked improvement were found to have deteriorated in social circumstances, the causes being death of husband, unemployment, development of pulmonary tuberculosis, and low intelligence respectively.

There was no significant difference between the sexes with regard to improvement in social circumstances (males 77.9 per cent.; females 72.7 per cent.).

The duration of the disease before admission to hospital was an important factor, as is shown by the percentage improvement in the four groups: under 1 year 88 per cent.; 1 to 5 years 72.8 per cent.; 5 to 10 years 71.4 per cent.; over 10 years 59.7 per cent.

There was no striking correlation between social improvement and economic class in the majority of instances, but the group of unskilled labourers fared worst (58 per cent. improved, as against 75-84 per cent. in other classes).

Housing conditions did not appear to exercise a significant influence on progress after hospital treatment. The changes in functional capacity and the overall estimate of progress at follow-up were not appreciably different in 56 patients found to be living in unsatisfactory houses from those in the group as a whole.

In respect of 171 housewives, the capacity for housework at follow-up was considered in relation to changes in social circumstances as assessed by the medical social worker. It was found that of 27 patients classified as fit for all household duties, 25 (92.6 per cent.) showed improvement in social circumstances. Among 78 fit for modified duties (*i.e.* all but the heaviest tasks) seventy (89.7 per cent.) improved socially. Amongst those classed as fit for light duties only, or as totally unfit for all housework (66 patients) only thirty (45.4 per cent.) showed any improvement in social circumstances at follow-up. It is clear that for the great majority of women engaged in household duties improvement in the medical sense leads to a corresponding improvement in living conditions in relation to the family group, provided skilled advice and assistance are available after discharge from hospital.

Earning Capacity.—The assessment of the effect of the disease on earning capacity was very difficult in this mixed group of patients, many of whom were housewives. However, the medical social worker made as accurate an assessment as possible of the changes in the family income in all 282 cases. An average for the 6 months preceding admission was compared with the level at the time of follow-up. In fifty patients the family income had improved because the patient's earnings had increased after discharge from hospital. In 41 cases income had improved as a result of increased pensions and allowances to the patient, or because of the increased earnings of other members of the family. In 186 cases there had been no significant alteration in the family income. In five instances there had been a fall in income, but only in three could this be directly attributed to decreased earning capacity on

the part of the patient. An analysis of results of treatment in the fifty patients whose earnings had increased showed that 86 per cent. had improved medically as compared with 70.5 per cent. of the group as a whole.

Type of Employment.—In many cases employment problems can be solved only if skilled advice and guidance are available on discharge from hospital. The medical social worker plays an important part at this stage, though her advice is not always followed. To assess the value of her work in this sphere, a comparison was made between the social circumstances at follow-up of three groups:

- (a) nineteen patients whose previous employment was regarded as suitable;
- (b) 41 patients who found suitable employment as a direct result of action taken by the medical social worker;
- (c) 31 patients who sought and found employment on their own account.

In Groups (a) and (b) combined, 83.2 per cent. were rated as having improved in social circumstances, whereas, in Group (c) only 67.7 per cent. showed improvement. These figures suggest that work regarded as suitable from the medical point of view more frequently leads to improvement in social circumstances than work found by the patients on their own account. The factors influencing the patients' response to advice regarding employment are many and complex, but where such advice and help can be accepted, results in terms of satisfactory resettlement would appear to justify the action taken.

Prognosis

The main difficulty in assessing the value of any form of treatment of rheumatoid arthritis lies in the fact that it is rarely possible to forecast the future course of the disease in an individual patient. Short and Bauer (1948) stated that in their group males appeared to fare a little better than females: the subsequent course was milder if the disease began below the age of 40, and if the joint involvement at the onset was asymmetrical; those below normal weight on admission to hospital did badly. The most striking factor affecting prognosis was found to be the duration of the disease before treatment was instituted. Patients treated within 1 year of the onset of symptoms showed a much more marked degree of improvement than those in whom the disease was of longer duration. Observing 250 cases of rheumatoid arthritis for an average period of 6 years, Bywaters and Dresner (1952) found that

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certain factors were associated with a favourable prognosis: males on the whole did better than females; low age at onset, short duration of illness, a low E.S.R., absence of anaemia, and absence of radiological changes in the joints at first attendance were all of favourable significance.

A detailed study of all the possible factors which might influence the prognosis was not considered justified in the present group, in view of the relatively short duration of follow-up, but attention was given to a few of the more obvious.

Duration of Disease.—From the information available it appeared likely that the duration of the disease before admission to hospital might be the most important factor in determining the response to treatment. For this reason it was decided to study this aspect first in the hope that an accurate estimate of its importance might make it easier to assess the relative significance of other possible influences on prognosis.

The relationship between the duration of the disease and the functional capacity on admission was examined first. It was found that the patients were evenly distributed among the four grades, irrespective of duration of disease. It was obvious, therefore, that duration of disease had no influence on functional capacity as assessed on admission. A similar analysis of the results on discharge from hospital (Table VII) revealed that 85.7 per cent. of those admitted during the first year of the disease and 83.9 per cent. of those admitted between the first and fifth year were placed in Grades I or II. In patients with disease of longer duration the results were much poorer: only 59.2 per cent. of patients in the 5 to 10-year group, and 64.7 per cent. in the over 10-year group reached the two upper grades.

TABLE VII

RELATIONSHIP BETWEEN FUNCTIONAL CAPACITY ON DISCHARGE AND DURATION OF DISEASE

Duration of Disease on Admission (yrs)	Functional Capacity on Discharge					
	Grades I and II		Grades III and IV		TOTAL	
	No.	%	No.	%	No.	%
Under 1 ..	72	85.7	12	14.3	84	100
1-5 ..	68	83.9	13	16.1	81	100
5-10 ..	29	59.2	20	40.8	49	100
Over 10 ..	44	64.7	24	35.3	68	100
TOTAL ..	213	75.5	69	24.5	282	100

At follow-up (Table VIII) the corresponding figures were 83.3, 75.3, 65.3, and 60.3 per cent. Functional capacity had been well maintained in the majority of patients, but the differences between

patients with disease of under or over 5 years' duration remained statistically significant.

TABLE VIII

RELATIONSHIP BETWEEN FUNCTIONAL CAPACITY AT FOLLOW-UP AND DURATION OF DISEASE

Duration of Disease on Admission (yrs)	Functional Capacity at Follow-up					
	Grades I and II		Grades III and IV		TOTAL	
	No.	%	No.	%	No.	%
Under 1 ..	70	83.3	14	16.7	84	100
1-5 ..	61	75.3	20	24.7	81	100
5-10 ..	32	65.3	17	34.7	49	100
Over 10 ..	41	60.3	27	39.7	68	100
TOTAL ..	204	72.4	78	27.6	282	100

The duration of disease was considered in relation to the number of grades of function gained or lost as assessed at follow-up. 78.6 per cent. of those admitted in the first year of the disease and 65.4 per cent. of the 1 to 5-year group had moved up one or more grades, as compared with 46.9 per cent. in the 5 to 10-year group, and 41.2 per cent. in the over 10-year group. The differences between the results in the under 5-year group and in the over 5-year group are statistically significant. Cases admitted during the first year consistently show the most marked and sustained improvement.

When duration of disease at the time of admission was considered in relation to the physician's general assessment of progress at follow-up, a similar pattern emerged. 84.5 per cent. of early cases showed moderate or marked improvement; 69.1 per cent. of the 1 to 5-year group; 67.3 per cent. of the 5 to 10-year group, and only 57.3 per cent. of the over 10-year group improved to the same extent. The greater measure of improvement seen in the cases of shorter duration is statistically significant.

The number of cases considered to be inactive on admission, on discharge, and at follow-up were studied (Table IX). The number classed as inactive amongst early cases (under 1 year) rose from five (6 per cent.) on admission to 24 (28.5 per cent.) on

TABLE IX

INACTIVE CASES ON ADMISSION, ON DISCHARGE, AND AT FOLLOW-UP IN RELATION TO DURATION OF DISEASE ON ADMISSION

Duration of Disease on Admission (yrs)	No. of Cases	Inactive Cases (per cent.)		
		On Admission	On Discharge	At Follow-up
Under 1 ..	84	6.0	28.5	40.5
1-5 ..	81	12.3	39.5	30.9
5-10 ..	49	12.3	38.8	18.4
Over 10 ..	68	11.8	38.3	28.0
TOTAL ..	282	10.6	36.3	29.4

discharge, and to 34 (40.5 per cent.) at follow-up. Although the number of inactive cases had increased on discharge amongst patients with disease of longer duration, the increase was not maintained at follow-up.

These results confirm the findings of Short and Bauer (1948). They must be borne in mind when considering the influence of other factors which may affect the response to treatment in hospital. The possibility must also be considered that factors other than duration of disease may influence response in patients admitted early in the disease.

Age at Onset.—This was considered in relation to the functional capacity at follow-up and the results are shown in Table X. The figures show no statistically significant differences in the effect of the disease on functional capacity in the various age groups.

TABLE X
RELATIONSHIP BETWEEN FUNCTIONAL CAPACITY AT FOLLOW-UP AND AGE AT ONSET OF DISEASE

Age at Onset (yrs)	Number of Patients	Graded I and II at Follow-up	
		No.	%
Under 40 ..	104	77	74.0
40—60 ..	147	106	72.1
Over 60 ..	31	21	67.7

To ascertain whether the age at onset bore any relationship to the capacity of patients to benefit from treatment, the degree of improvement in functional capacity in the three age groups was compared (Table XI). From these figures it appears that patients who contract the disease late in life respond remarkably well to treatment. It should be noted, however, that more patients in the oldest age group were admitted to hospital within 1 year of onset of the disease (74 per cent.), than in the 40 to 60-year group (30 per cent.), and the under 40-year group (17.4 per cent.).

TABLE XI
PERCENTAGE IMPROVEMENT IN FUNCTIONAL CAPACITY AT FOLLOW-UP RELATED TO AGE AT ONSET OF DISEASE

Age at Onset (yrs)	Number of Patients	Improvement in Functional Capacity	
		By 2 or more grades	By 1, 2, or more grades
Under 40 ..	104	23.0	51.9
40—60 ..	147	24.5	61.9
Over 60 ..	31	32.2	77.4

It appeared possible that the favourable influence of early admission to hospital might be responsible for the good response to treatment in the older age group. This was investigated by considering the duration of the disease on admission in patients grouped according to age at onset. It was found

that no significant difference could be demonstrated which was due to age at onset alone. The factor of age at onset did not therefore appear to be of any prognostic significance in respect of the immediate response to treatment. This does not imply that the long-term prognosis is necessarily the same at all ages.

Sex.—Table XII shows the distribution of males and females in the four grades of functional capacity on admission, on discharge, and at follow-up. There was no marked difference between the sexes on admission and on discharge. There was, however, a striking change in pattern at the time of follow-up when 41.5 per cent. of males had reached Grade I as compared with only 23.4 per cent. of females, and 32.2 per cent. of females remained in Grades III and IV, as compared with only 15.6 per cent. of males.

TABLE XII
COMPARISON OF RESULTS OF TREATMENT IN 77 MALES AND 205 FEMALES, AS MEASURED BY PERCENTAGE CHANGES IN FUNCTIONAL CAPACITY

Grade of Functional Capacity	On Admission		On Discharge		At Follow-up	
	Males	Females	Males	Females	Males	Females
I ..	—	—	7.8	12.7	41.5	23.4
II ..	36.4	35.1	75.3	60.0	42.9	44.2
III and IV	63.6	64.9	16.9	27.3	15.6	32.2

The results of assessment of disease activity on admission, on discharge, and at follow-up (Table XIII) show a similar trend; at follow-up 42.9 per cent. of males and only 26.3 per cent. of females were graded as inactive.

TABLE XIII
COMPARISON OF PERCENTAGE CHANGES IN DISEASE ACTIVITY IN 77 MALES AND 205 FEMALES

Degree of Disease Activity	On Admission		On Discharge		At Follow-up	
	Males	Females	Males	Females	Males	Females
Inactive ..	10.4	10.2	44.2	32.7	42.9	26.3
Moderate	71.4	60.5	53.2	61.5	55.8	69.3
Marked ..	18.2	29.3	2.6	5.8	1.3	4.4

All these differences between the sexes in respect of functional capacity and disease activity are statistically significant.

Investigation of the factor of early admission to hospital revealed that 36.5 per cent. of the males were admitted during the first year of the disease, in comparison with 27.7 per cent. of the females. When the influence of early admission upon the response to treatment in the two sexes was investi-

gated, no significant difference was found; 89·3 per cent. of males admitted to hospital within the first year reached Grades I and II, compared with 80·4 per cent. of females. In cases of longer duration, the females did not improve as markedly as the males, but the difference was not statistically significant in any of the modes of improvement measured.

It would thus appear that males generally fare better than females, except in cases admitted to hospital within the first year, when the response to treatment is equally good in both sexes.

Activity of Disease on Admission.—Patients were classed as inactive, moderately active, or markedly active on admission to hospital. Only 29 were inactive, and comparison was made at follow-up between the progress of those considered to be moderately active on admission with that of those showing signs of marked activity. Of the moderately active group (179 patients), 69·7 per cent. were assessed as showing moderate or marked improvement. Of the markedly active group (74 patients), 71·6 per cent. showed moderate or marked improvement. Thus the degree of disease activity as assessed on admission to hospital did not appear to exercise any marked influence on the subsequent progress of the patients in this series.

The two main groups of marked and moderate disease activity were further examined, to ascertain whether the factor of early admission to hospital had unduly influenced the prognosis in either. It was found that early cases did equally well, irrespective of whether they were moderately active (78·8 per cent. improved) or markedly active (74·1 per cent. improved) on admission. The small group of cases characterized by long duration and marked disease activity did extremely badly when judged by ultimate functional level, grades of functional capacity improved, or physicians' assessment of progress. Disease activity is thus of no value as a factor in the assessment of prognosis, except when a severe degree of activity is associated with long duration of disease.

Type of Course of Disease.—The course run by an individual patient suffering from rheumatoid arthritis may vary over the years and only a very broad classification is possible. As previously noted, the patients were divided into three groups:

- (1) Slowly progressive.
- (2) Exacerbations and remissions.
- (3) Rapidly progressive.

The results of treatment in terms of functional capacity, as assessed at follow-up, were compared

in the three groups (Table XIV). The number of patients in Group 3 is relatively small (46) in comparison with the other two groups (111 and 125), but there is an impressive difference in the results of treatment.

TABLE XIV
RELATIONSHIP BETWEEN TYPE OF COURSE AND CHANGES IN FUNCTIONAL CAPACITY

Grade of Functional Capacity at Follow-up	Type of Course of Disease					
	Slowly Progressive		Remissions and Exacerbations		Rapidly Progressive	
	No.	%	No.	%	No.	%
I	26	23·4	29	23·2	25	54·3
II	49	44·2	58	46·4	17	37·0
III	32	28·8	35	28·0	4	8·7
IV	4	3·6	3	2·4	0	—
TOTAL	111	100	125	100	46	100

When the 84 cases admitted within 1 year of onset were classified by type of course, 38 were placed in Groups 1 and 2 and 46 in Group 3. On admission, fourteen (30·4 per cent.) of the rapidly progressive cases (Group 3) and thirteen (34·2 per cent.) of the rest (Groups 1 and 2) were placed in Grade II functional capacity. This difference is not significant. On discharge, 42 (91·3 per cent.) rapidly progressive cases and thirty (79 per cent.) of the other two types were placed in functional Grades I and II. The difference does not reach the level of statistical significance, although it is in favour of the rapidly progressive cases. At follow-up, 41 (91·3 per cent.) of the rapidly progressive types were in Grades I and II, compared with 28 (73·7 per cent.) of the other two types. Although the difference again fails to reach the level of statistical significance ($\chi^2 = 3·46$ with 1 d.f. $0·1 > P > 0·05$) it is worth noting that there is a consistent difference which favours cases with a rapidly progressive course.

The overall assessment of progress was used to estimate improvement in patients grouped according to the type of course and the duration of the disease. Of the 46 patients running a rapidly progressive course (Group 3), all of whom were admitted within 1 year of the onset, 87 per cent. had improved markedly or moderately in comparison with 81·6 per cent. of the other two groups of patients (Groups 1 and 2) admitted within 1 year of onset. The difference is not significant. Of the patients admitted between 1 and 5 years of onset (all belonging to Groups 1 and 2), only 69·1 per cent. showed moderate or marked improvement.

When improvement by grades of functional capacity was used as the measure of progress, 82·6 per cent. of the rapidly progressive group were found to have advanced by one or more grades, in comparison with 71 per cent. of the other groups admitted within the first year. The 1 to 5-year group showed an improvement in 65·4 per cent. cases. The difference between the rapidly progressive cases and the others admitted within 1 year is again not statistically significant, but it probably constitutes a real difference.

Distribution of Affected Joints.—In view of the statement of Short and Bauer (1948) that the prognosis was worse in those patients in whom the joints were symmetrically affected at the onset of the disease, patients were grouped by symmetry or asymmetry of joint involvement on admission, to assess the response to treatment in the two groups. In 143 patients involvement was symmetrical. In 139 it was asymmetrical. There was no significant difference between the two groups in regard to functional capacity on admission, and as judged by improvement in functional capacity at follow-up, the progress of the two groups was very similar. It was therefore considered that the pattern of joint involvement at the time of admission was of no value in predicting the response to treatment.

Economic Class on Admission.—It was possible to divide 117 patients into two groups, those in the professional and clerical classes (38 patients) and those in the manual skilled, semi-skilled, and unskilled classes (79 patients). Functional capacity in the two groups at follow-up were compared. It appeared that professional and clerical workers did less well on the whole than manual workers; only 26·3 per cent. of the former became fit for all normal activities as opposed to 41·7 per cent. of the latter. This was confirmed by the assessment of change in functional capacity at follow-up; 52·6 per cent. of the professional or clerical workers were moved up one or two grades as compared with 69·6 per cent. of the manual workers. Although the better response of the manual workers does not attain the level of statistical significance, it is a noteworthy and rather surprising finding.

Type of Work.—In view of the possibility that those engaged in manual work derived greater benefit from hospital treatment than those in more sheltered occupations, a further examination of the nature of employment in relationship to results of treatment was made in 115 patients. Work was classified as heavy, medium, or light, on the basis of

the degree of physical effort required in its performance. Employment was classed as heavy in twenty patients, medium in 51, and light in 44. In order to simplify comparison, the results in the groups performing heavy and medium work were combined and compared with those in patients doing light work. In the assessment of functional capacity at follow-up, 67·6 per cent. of the medium and heavy workers were moved up one or more grades as compared with 56·8 per cent. of those doing light work. Although the difference does not reach the level of statistical significance, the more favourable response of the medium and heavy workers is a finding of some interest. It indicates at least that manual labour does not exert an unfavourable effect upon the response to treatment, and it may be that rehabilitation is easier in people accustomed to relatively strenuous effort in the course of their daily activities.

Degree of Disability on Admission.—To assess the effect on prognosis of the degree of disability on admission to hospital, patients were grouped in accordance with their initial functional grading. On admission no patients were placed in Grade I. The changes in the other three grades at discharge and follow-up were compared. Those with moderate impairment of function on admission showed the greatest degree of improvement, 99 per cent. being found in Grades I and II on discharge, and 88 per cent. still in those grades at follow-up, the total in Grade I having increased by ten. The groups with marked impairment of function or confined to bed or chair showed a much less striking degree of improvement when assessed on discharge and follow-up. These figures emphasize the need for early treatment in hospital if the best results are to be obtained.

Haemoglobin Level on Admission.—Anaemia of greater or lesser degree is a common feature of the active phase of rheumatoid arthritis. To ascertain whether the degree of anaemia present on admission was related to the subsequent response to treatment patients were grouped according to whether they were anaemic (Hb <80 per cent.) or not (Hb 80 per cent. and over). By this standard, 111 patients were classed as anaemic on admission and 171 as non-anaemic.

The changes in functional capacity in the two groups were compared on admission and at follow-up. 27 per cent. of the anaemic group and 40·1 per cent. of the others were in Grade II of functional capacity on admission. At the time of discharge 69·4 per cent. of the anaemic group and 80·7 per

cent. of the others were in Grades I and II. At follow-up 64.9 per cent. of the anaemic group remained in Grades I and II, in comparison with 77.8 per cent. of the others. The changes in functional capacity in the two groups do not differ significantly.

With regard to the general assessment of improvement, 65.8 per cent. of the anaemic group and 73.6 per cent. of the others were considered to show marked or moderate improvement. This difference is not statistically significant.

When improvement in grades of functional capacity was taken as the measure of progress, 55 per cent. of the anaemic group and 63.7 per cent. of the remainder had improved by one or more grades. Again, this difference is not statistically significant.

When a haemoglobin level of under 85 per cent. was used as an indication of anaemia there was no change in the pattern of results. On the other hand, in patients with an initial haemoglobin level of under 65 per cent., response to treatment was much less satisfactory, but the small number of patients (24) with anaemia of this severity invalidated statistical comparison.

It would appear that although cases with a moderate degree of anaemia on admission are capable of as good a response to treatment as those without significant anaemia, the latter were less severely incapacitated initially and throughout the period of observation. In patients with a more severe degree of anaemia on admission the response to treatment was poor.

Erythrocyte Sedimentation Rate on Admission and Discharge.—The E.S.R. on admission was considered in relation to the general assessment of progress made at follow-up. Of 58 patients with a rate of 20 mm./hr or less, 69 per cent. showed moderate or marked improvement, and 14.3 per cent. had deteriorated. Of 152 patients with rates between 20 and 60 mm./hr, 71 per cent. showed moderate or marked improvement and 16.1 per cent. had deteriorated. Of 72 patients with rates over 60 mm./hr, 72.2 per cent. showed moderate or marked improvement and 20.8 per cent. had deteriorated. In view of the unexpectedly good results in patients with a high E.S.R. on admission, the 72 were divided into those admitted to hospital within one year of onset (28) and those with disease of longer duration (44). It was found that of the 28 cases admitted within one year, 83.7 per cent. had been assessed as showing a moderate or marked improvement, whereas only 63.6 per cent. of the remaining 44 had improved to the same extent.

The general assessment of improvement at follow-up was compared with the sedimentation rate on discharge. The number with a rate under 20 mm./hr was 113, of whom 74.3 per cent. showed moderate or marked improvement and 12.4 per cent. were worse. Of 116 patients with rates between 20 and 60 mm./hr, 68.1 per cent. showed moderate or marked improvement and 18.1 per cent. had deteriorated. Of the 53 with rates over 60 mm./hr 67.9 per cent. had improved and 24.5 per cent. had deteriorated.

When the E.S.R. on admission was considered in relation to changes in functional capacity as assessed at follow-up, there was little difference between the three groups in the proportion of cases improved by one or two grades. It is interesting to note, however, that 30.6 per cent. of patients with a rate of over 60 mm./hr on admission improved sufficiently to be moved up two grades. This is in keeping with the previous observation that cases with an acute onset tend to be admitted to hospital at an early stage and to show substantial benefit from treatment.

It would appear that an erythrocyte sedimentation rate over 60 mm./hr is of graver prognostic significance in patients with disease of longer duration than it is in those admitted to hospital within a year of the onset of symptoms. Unless the duration of the disease is taken into consideration, the E.S.R. on admission to hospital is of little value in predicting the ultimate results of treatment in an individual patient.

Discussion

Accurate evaluation of any regime of treatment used in rheumatoid arthritis is rendered very difficult by the lack of information on the natural history of the untreated disease. It is ethically impossible to acquire such information by the study of a large enough group of patients denied all forms of treatment over a period of years. Simple conservative measures, although in themselves unlikely to alter the course of the disease, may significantly influence its effects on the patient. Early application of splints to affected joints may prevent serious impairment of function, or even complete crippledom, without altering the underlying disease process. A clear distinction must be drawn between those forms of treatment, such as gold, which are used in the hope that they will diminish the activity of the disease, and those whose sole aim is the conservation or restoration of function in the affected joints. The value of such simple conservative measures may have been under-estimated in the past. Judged by the results obtained in a recent trial designed to compare the value of cortisone and

aspirin in the treatment of early cases of rheumatoid arthritis (Report by the Joint Committee of the M.R.C. and Nuffield Foundation, 1954), aspirin is as effective as cortisone in maintaining the functional level and controlling the activity of the disease in such patients when both are combined with a simple regime of splints and physiotherapy. At the end of 1 year of treatment the disease was judged to be inactive or only slightly active in 75 per cent. of the patients, and 40 per cent. were regarded as capable of normal work and activity in both groups. It is important to remember, however, in assessing the significance of these results, that the prognosis in patients admitted to hospital within 1 year of the onset of the disease, is very much better than it is in patients coming under treatment for the first time at a later stage. This is borne out in the present study, and further reference will be made to this point later. The application, over a term of years, of simple conservative measures leads to satisfactory results in some 50 per cent. of patients (Short and Bauer, 1948; Ragan, 1949). Results in the present study show that some 70 per cent. of patients showed moderate or marked improvement in their general clinical condition at the end of an average period of 2 years from their discharge from hospital. The proportion of cases in the upper two grades of functional capacity had risen from 35.4 per cent. (all in Grade II) on admission, to 72.4 per cent. at the last follow-up examination. Disease activity decreased substantially following treatment in hospital and this was maintained during the follow-up period. These results compare very favourably with those reported by other workers after the use of gold.

Short (1942) reviewed the gross results reported by various authors. Of 1,800 cases, 63 per cent. showed marked improvement; in 13 per cent. the disease was apparently arrested.

Ragan and Tyson (1946) reported both the immediate response and the results after 3 or 4 years in 142 patients, summarized as follows: Of patients receiving one or two courses of gold, 10 to 20 per cent. can be expected to show no improvement, and 40 to 60 per cent. to show striking improvement, but 80 to 90 per cent. of these will relapse within 5 years.

Ragan (1951) reported the results of treatment at the end of 5 years in 143 patients seen in the first 2 years of their disease: 68 were given gold with good end results in 63 per cent.; 75 received no gold, and in 70 per cent. the end result was good.

The period of follow-up in the present series is too short to allow of strict comparison with these reports, but it would appear that, although temporary remissions in disease activity can be induced

by the administration of gold, these cannot be maintained in the majority of cases. In view of the danger of toxic effects and the good response to conservative treatment, little appears to be gained by the administration of gold to patients suffering from rheumatoid arthritis, as the natural course of the disease, when viewed over a term of years, does not appear to be materially altered for the better.

As has already been mentioned, cortisone has proved no more effective than aspirin in the treatment of early cases. It remains to be shown whether its use in cases of longer duration will prove advantageous.

When the medical assessment of improvement in functional capacity is checked against the actual day-to-day activities of patients at home and at work as reported at follow-up examination, there appears to be good correlation. This has been a reassuring feature of the present study, for assessments of improvement in the purely medical aspects of a disease often have little relationship to what the patient is actually able to do.

There appeared to be a close relationship between improvement in health and functional capacity and betterment in social circumstances as assessed by the medical social worker at follow-up. Much of the success of social and economic rehabilitation in these patients could be directly attributed to action taken on their behalf by the medical social worker during and after their stay in hospital. There is no doubt in our minds that the services of a skilled medical social worker, keenly interested in the particular problems of crippled patients and with sufficient time to study their needs, are of inestimable value. Much of the improvement following medical treatment can only be maintained and consolidated if such help is constantly available. Whenever possible patients must be restored to economic as well as physical independence. Long periods of idleness after fitness for work has been restored have a most demoralizing effect on potential wage earners. In terms of re-employment and the maintenance or improvement of earning capacity, results in the present study have been reasonably satisfactory. In only five instances among 282 patients had the family income fallen between discharge from hospital and the last follow-up examination.

With regard to the type of employment, it is of interest to note that the results of treatment in patients previously employed in work requiring heavy or medium physical effort were somewhat better than in former sedentary workers. It has been suggested that physical rehabilitation may be easier in patients accustomed to fairly strenuous activity.

Of the various factors which may be significant in predicting the response to treatment, the age at the onset of the disease did not appear to be of great importance in the present study.

With regard to sex, the immediate response to treatment in males and females differed little, but assessment at follow-up revealed a striking change in distribution of the sexes over the four grades of functional capacity. In proportion, nearly twice as many males were placed in Grade I, and double the number of women were placed in the two lower grades. The same trend is revealed in the assessment of disease activity at follow-up. It would appear that a higher proportion of males continue to improve after discharge from hospital. This is in agreement with the findings of Short and Bauer (1948), and Bywaters and Dresner (1952), that the prognosis is materially better in males than in females. It would appear, however, that when patients are admitted to hospital within 1 year of the onset of symptoms subsequent progress is as satisfactory in females as in males, although a more prolonged follow-up will be necessary before this impression can be confirmed.

The most important conclusion reached, on the basis of an analysis of the results of treatment on discharge and at follow-up, is that the immediate prognosis in patients admitted to hospital within 1 year of the onset of symptoms is very materially better than it is in patients coming under treatment at a later stage of the disease. This is in general agreement with the findings of other workers. In considering the significance of the striking difference in the response to treatment between cases admitted to hospital early in the disease and those of longer duration, it must be borne in mind that many cases of rheumatoid arthritis run a relatively mild course and prolonged remissions are not uncommon. There is no means at present of distinguishing such cases during the early stages of the disease from others with a graver prognosis. Admission of a significant number of such cases would undoubtedly exert a favourable influence on the pattern of response. All that can be said at this stage is that, in the judgment of the physicians concerned, the patients admitted at an early stage in the disease, all of whom had been under observation as out-patients, appeared to be in urgent need of treatment in hospital. This may be of more significance when it is realized that, in a unit with a limited number of beds, the milder type of case is usually maintained on out-patient treatment so long as clinical progress is reasonably favourable.

As has already been indicated, it was found that all patients with an acute onset and who ran a

progressive course had been admitted to hospital within the first year. Their response to treatment was remarkably good and improvement was maintained in the majority throughout the period of follow-up. When their progress was compared with that of the other patients admitted in the first year, they appeared to fare a little better, although the difference did not reach the level of statistical significance. These results suggest that an acute onset may signify a better immediate prognosis than is the case when symptoms and signs appear more insidiously. More detailed study of patients with this type of onset should prove of considerable interest. Their excellent progress both during and after treatment in hospital may indicate that signs of a marked systemic disturbance at the onset occur in cases destined to run a relatively benign course, whether or not they undergo treatment in hospital.

The symmetry or otherwise of the distribution of affected joints on admission did not appear to be of importance, but a longer period of observation may reveal differences not obvious at the present time.

As would be expected, the degree of disability on admission was an important factor in determining the response to treatment. Those with moderate impairment responded much more satisfactorily than those in whom disability was marked, emphasizing once more the need for the institution of treatment before irreversible damage has taken place in many joints.

The haemoglobin level on admission proved to be of little value in predicting the response to treatment, although the small group of patients with levels below 65 per cent. on admission did badly. Similarly, the erythrocyte sedimentation rate and the assessment of disease activity on admission were of little help, although in cases of long duration associated with a marked degree of disease activity on admission, the immediate prognosis was poor. As already indicated, a high E.S.R. in cases with an acute onset admitted within the first year was not of serious significance.

Summary

The objects of this study were to assess the immediate results of treatment in hospital on patients with rheumatoid arthritis; to ascertain how long improvement could be maintained after discharge; to determine the relationship between clinical progress and changes in social and economic status, and to obtain information about factors which might help to predict the likely response to treatment of individual patients. The original group consisted of 307 patients admitted to hospital between

June, 1948, and July, 1951. 282 of this group were available for assessment at the last follow-up examination. Certain broad conclusions have been reached:

(1) The admission to hospital of patients with rheumatoid arthritis is followed in the majority of cases by a substantial improvement in functional capacity and a significant decrease in the activity of the disease.

(2) Improvement is well maintained after discharge, although a more prolonged follow-up is required before it can be claimed that the natural course of the disease has been significantly altered.

(3) A close relationship exists between improvement in the medical sense and betterment of social and economic circumstances.

(4) When skilled advice and help are available, increase in functional capacity leads to increased efficiency at home and at work.

(5) In predicting the immediate response to treatment and the subsequent course of the disease, the most important single factor appears to be the duration of symptoms before admission to hospital. Patients admitted within one year of onset respond very satisfactorily to the basic regime of treatment and the majority continue to improve after discharge. However, results at this stage of the disease may be favourably influenced by the admission of a proportion of patients in whom it is destined to run a relatively benign course.

(6) An acute onset followed by a rapidly progressive course in the early stages may indicate a rather benign form of the disease.

(7) The erythrocyte sedimentation rate and the level of disease activity on admission have little bearing on prognosis.

(8) A mild or moderate degree of anaemia on admission is not of grave significance, but when anaemia is more severe, response to treatment is less satisfactory.

(9) Detailed social and medical supervision may play a fundamental part in consolidating the benefits of hospital treatment. The medical social worker occupies a key position in the organization of long-term care and follow-up.

(10) The results which follow the conscientious application of conservative forms of treatment in hospital compare favourably with those claimed for other forms of treatment, such as the administration of gold or cortisone.

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Aspects médicaux et sociaux du traitement de l'arthrite rhumatoïdale avec mention particulière des facteurs concernant le pronostic

RÉSUMÉ

Cette enquête sur des malades atteints d'arthrite rhumatoïdale avait pour but de: évaluer les résultats immédiats du traitement hospitalier; déterminer combien de temps après le renvoi de l'hôpital l'amélioration peut être soutenue; déterminer le rapport entre le progrès physique et les changements des conditions sociales et économiques; et obtenir des renseignements sur les facteurs qui permettraient d'anticiper la réponse individuelle au traitement. Le groupe original consistait de 307 malades hospitalisés entre juin, 1948 et juillet, 1951. 282 d'entre eux ont été suivis et évalués au dernier examen. On est arrivé à quelques simples conclusions:

(1) L'hospitalisation des malades atteints d'arthrite rhumatoïdale est accompagnée dans la plupart des cas d'une amélioration sensible de la capacité fonctionnelle et d'une diminution appréciable de l'activité morbide.

(2) L'amélioration persiste bien après le renvoi quoique une observation plus longue serait nécessaire pour pouvoir dire que l'évolution naturelle de la maladie ait été appréciablement modifiée.

(3) Il existe un rapport étroit entre l'amélioration dans le sens médical et celle des conditions sociales et économiques.

(4) Bien avisé et habilement secouru, le malade dont la capacité fonctionnelle est augmentée devient plus efficace chez lui et au travail.

(5) En prédisant la réponse immédiate au traitement et l'évolution ultérieure de la maladie, de tous les facteurs particuliers la durée des symptômes avant l'hospitalisation semble être le plus important. Les malades qui entrent au cours de la première année de leur maladie réagissent très bien au régime essentiel de traitement et la plupart d'entre eux continue à progresser après la sortie. A cette période de la maladie, cependant, les résultats pourraient être favorablement influencés par l'hospitalisation d'un certain nombre des cas destinés peut-être à une évolution relativement bénigne.

(6) A la période initiale, un début aigu et une évolution rapide peuvent indiquer qu'il s'agit d'une forme bien bénigne de la maladie.

(7) La vitesse de la sédimentation érythrocytaire et l'intensité morbide au moment de l'hospitalisation ont peu d'importance pronostique.

(8) Une anémie légère ou modérée à l'entrée n'importe pas beaucoup, mais lorsqu'elle est plus sévère le malade réagit moins bien au traitement.

(9) La surveillance médicale et sociale scrupuleuse peut jouer un rôle essentiel dans la consolidation des

avantages du traitement hospitalier. L'assistant social sanitaire assume la position principale dans l'organisation des soins post-hospitaliers à long terme.

(10) Les résultats de l'application consciencieuse des méthodes conservatrices de traitement hospitalier ne cèdent en rien à ceux revendiqués pour d'autres méthodes, telles que l'administration de sels d'or ou de cortisone.

Aspectos médicos y sociales del tratamiento de la artritis reumatoide, con mención especial de los factores que afectan el pronóstico

SUMARIO

Se han estudiado enfermos con artritis reumatoide con el objeto de: valorar los resultados inmediatos del tratamineto hospitalario; averiguar cuanto tiempo permanece la mejoría después de la alta; determinar la relación entre el progreso clínico y los cambios de las condiciones sociales y económicas; hallar los factores que permitan anticipar la reacción probable de enfermos individuales al tratamiento. El grupo original consistía de 307 enfermos hospitalizados entre el junio de 1948 y el julio de 1951; de estos, 282 se han podido seguir y examinar en la última valoración. Se ha llegado a algunas conclusiones generales:

(1) La hospitalización de enfermos con artritis reumatoide conduce, en la mayoría de los casos, a una mejoría apreciable de la capacidad funcional y a un regreso marcado de la actividad mórbida.

(2) La mejoría permanece bastante bien después de la alta, aunque un período de observación más largo sería necesario para poder afirmar que el curso natural de la enfermedad haya sido apreciablemente modificado.

(3) Hay relación estrecha entre la mejoría en el sentido médico y la de las condiciones sociales y económicas.

(4) Provisto de consejo y ayuda pericial, el enfermo con su capacidad funcional aumentada se vuelve más eficaz en su casa y en su trabajo.

(5) Para anticipar el resultado cercano del tratamiento y el curso ulterior de la enfermedad, la duración de los síntomas antes de la baja parece el factor particular mas importante. Los enfermos hospitalizados en el primer año de dolencia responden muy bien al régimen básico de tratamiento y en la mayoría de ellos el curso favorable sigue después de la alta. Hay que tomar en cuenta, sin embargo, que en este período de la enfermedad algunos habrían podido tener una evolución benigna también sin hospitalización.

(6) En el período inicial, el comienzo agudo y la evolución rápida pueden indicar que se trata de una forma bastante benigna de la enfermedad.

(7) La velocidad de la sedimentación eritrocitaria y la intensidad de la actividad mórbida en el momento de la baja tienen poca importancia pronóstica.

(8) Una anemia leve o moderada al tiempo de la baja tiene poca importancia pero con una anemia más grave la respuesta al tratamiento es peor.

(9) La vigilancia médica y social escrupulosa puede desempeñar un papel fundamental en la consolidación de los beneficios del tratamiento hospitalario. El asistente médico domiciliario es el pivote en la organización de la vigilancia y de los cuidados posthospitalarios lejanos.

(10) Los resultados de la aplicación escrupulosa de métodos conservadores de tratamineto hospitalario no son inferiores a los reivindicados para otros métodos, tales como la crisoterapia o el tratamiento por la cortisona.