

AN INQUIRY INTO THE MORE REMOTE PROGNOSIS IN WAR NEPHRITIS

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THIS inquiry was undertaken with a view to throwing some light upon the more remote prognosis in that particular form of acute nephritis which was so common in the armies on the Western Front during the War. It is hoped, however, that the conclusions arrived at may not be without bearing upon the problem of the prognosis in acute nephritis as met with in civil life.

A part of the facts to be detailed is derived from the study of the after-histories of a series of patients, who were observed while in the acute stage of war nephritis at a base Hospital in France early in 1917, and whose progress up to the middle of 1921 it has been possible to follow, through the kindness of the Ministry of Pensions and the Medical Research Council. Further interesting facts relative to the prognosis generally in this condition have been supplied by the Ministry of Pensions from their very extensive records.

The directly observed material consists of about 125 cases, all of which came under observation by the writer within a few days of the onset of the condition and remained under personal supervision for from one to six weeks. These were all indubitable cases of acute nephritis, all characterized by oedema, albuminuria, and haematuria, though the extent of these symptoms differed very greatly from case to case. For the purposes of this investigation 100 perfectly typical cases have been taken at random out of this series of 125 and, with the assistance of the Ministry of Pensions, their after-histories up to the middle of 1921—a period of about $4\frac{1}{2}$ years from the onset—followed as closely as possible.

First, as to mortality rate: of these 100 cases, it was found that by the middle of 1921 three had died. One of these was aged 37 and the remaining two 26 and 29 respectively. From such a small number, however, it is impossible to make any deduction as to the effect of age on the prognosis in regard to death. One of these patients died of scarlet fever, with which he became affected while yet in hospital, and died within nine months of the onset of the nephritis. A fatal issue in scarlet fever is so rare in a patient of this age, that it seems justifiable to attribute his death largely to the renal condition. Some interest attaches to this case in view of the suggestion, made at the time when war nephritis was the subject of a good deal of attention, that every case should be regarded as a part of, or as the result of, an undiagnosed attack of scarlet

fever. A second attack of scarlet fever is a rarity and, at so short an interval, a high improbability. The cause of death in the remaining two cases is specified as 'nephritis' and appears to have occurred as the result of acute exacerbation of the renal condition. No information was to be had as to the state of the kidneys at death. The period from onset of the fatal termination in these cases was 18 and 27 months respectively.

Of the remaining 97 cases, 65 were eventually returned to duty, but of these 2 had recurrences while serving in France, and finally became pensioners from the condition. The remaining 32 were discharged as unfit.

At all ages, then, the immediate disposal of 100 cases was as follows :

TABLE I.

Returned to duty	65 %
Discharged unfit	32 %
„ „ (later died)	3 %

On breaking up the cases into two age groups of under and over 35 years respectively, the following figures are obtained :

TABLE II.

	Under 35.	Over 35.
Returned to duty	44 = 66·6 %	21 = 61·7 %
Discharged unfit	20 = 30·3 %	12 = 35·4 %
„ „ (later died)	2 = 3·1 %	1 = 2·9 %
	<hr/> 66 = 100 %	<hr/> 34 = 100 %

It is noteworthy that the percentage of those returning to duty in the category under 35 is higher by 4·9 per cent. than in that for those over that age ; the percentage of those discharged unfit is correspondingly higher among those over than under 35. This is an intimation that the immediate prognosis as regards degree of recovery is better under than over the age of 35.

Evidence as to this unfavourable influence of increasing years upon the general outlook becomes stronger on further inquiry.

With a view to ascertaining the rate at which and the degree to which recovery takes place in this condition, the histories of all those who still were or ever had been in receipt of a pension were obtained, through the kindness of the Ministry of Pensions. With six exceptions, those of whom the Ministry of Pensions had no record were those who had been restored to health and returned to duty. These six exceptions were men who, at the termination of their stay in hospital, were discharged as unfit, but who had never been awarded a pension. For the purposes of this inquiry they are regarded as being only 'partly fit', but not actually 'invalid', and are included in the second class described below.

In order to simplify matters in gauging degree of recovery, this is considered in three grades. In Class I are included all those cases in which, after the cessation of hospital treatment, the restoration to health was regarded as complete—this being evidenced during the war by the return of the patient to duty, and, after demobilization, by the fact that no pension, or one of under 20 per

cent., was awarded. Under Class II are included those cases in which, though the return of health was not complete, the patients did not actually remain invalid, the criterion for this being the award of a pension of from 20 per cent. to under 60 per cent. The six patients mentioned above as having been discharged unfit but awarded no pension are arbitrarily included in this class throughout the period under consideration. Class III comprises all cases actually invalid, as evidenced by receipt of a pension of from 60 per cent. to 100 per cent., or by the fact that the patient remained under full hospital treatment. Class IV consists of those who died in the period under consideration. On the chart drawn up on this basis the classes are designated as follows: Class I = fit, Class II = partly fit, Class III = invalid, Class IV = dead.

The actual figures on which the chart is compiled are as follows:

TABLE III.

All Ages.	End of 1917	1918	1919	1920	1921
Class I (fit)	68	74	73	77	79
Class II (partly fit)	24	18	23	18	17
Class III (invalid)	7	7	2	3	1
Class IV (dead)	1	1	2	2	3
	100				

These figures show the speedy recovery of the majority, 68 per cent. of the cases; all of which had terminated in complete recovery by the end of twelve months from the onset of the condition. They further show that, in those cases in which complete restoration to health had not taken place at the end of twelve months, there is a marked tendency for the condition to take on a chronic form. Thus by 1921, at the end of four and a half years from the onset, only 11 per cent. more cases had attained to full recovery, leaving 17 per cent. partly fit and 1 per cent. invalid, while 3 per cent. were dead.

Of the 100 cases considered above 34 were over and 66 were under the age of 35 years. The course in these age groups is shown below.

TABLE IV.

	Over 35.				
	End of 1917.	1918.	1919.	1920.	1921.
Class I	21 = 61.8 %	23 = 67.6 %	24 = 70.6 %	25 = 73.5 %	25 = 73.5 %
Class II	10 = 29.2 %	9 = 26.4 %	9 = 26.4 %	7 = 20.5 %	8 = 23.5 %
Class III	3 = 9.0 %	2 = 6.0 %	1 = 3.0 %	2 = 6.0 %	0
Class IV	0	0	0	0	1 = 3.0 %
	34 = 100 %				

TABLE V.

	Under 35.				
	End of 1917.	1918.	1919.	1920.	1921.
Class I	47 = 71.2 %	51 = 77.2 %	49 = 74.1 %	52 = 78.7 %	54 = 81.7 %
Class II	14 = 21.2 %	9 = 13.6 %	14 = 21.2 %	11 = 16.6 %	9 = 13.6 %
Class III	4 = 6.0 %	5 = 7.6 %	1 = 1.6 %	1 = 1.6 %	1 = 1.6 %
Class IV	1 = 1.6 %	1 = 1.6 %	2 = 3.1 %	2 = 3.1 %	2 = 3.1 %
	66 cases = 100 %				

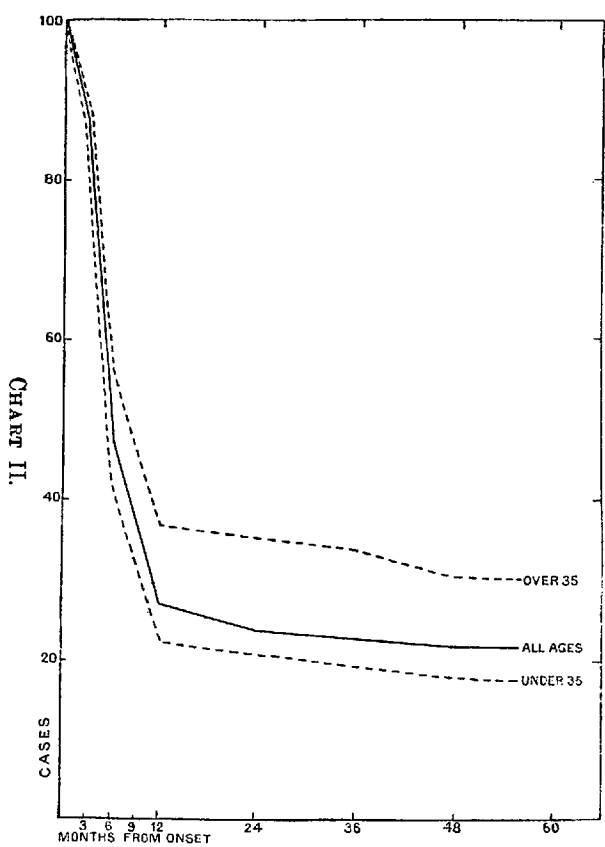
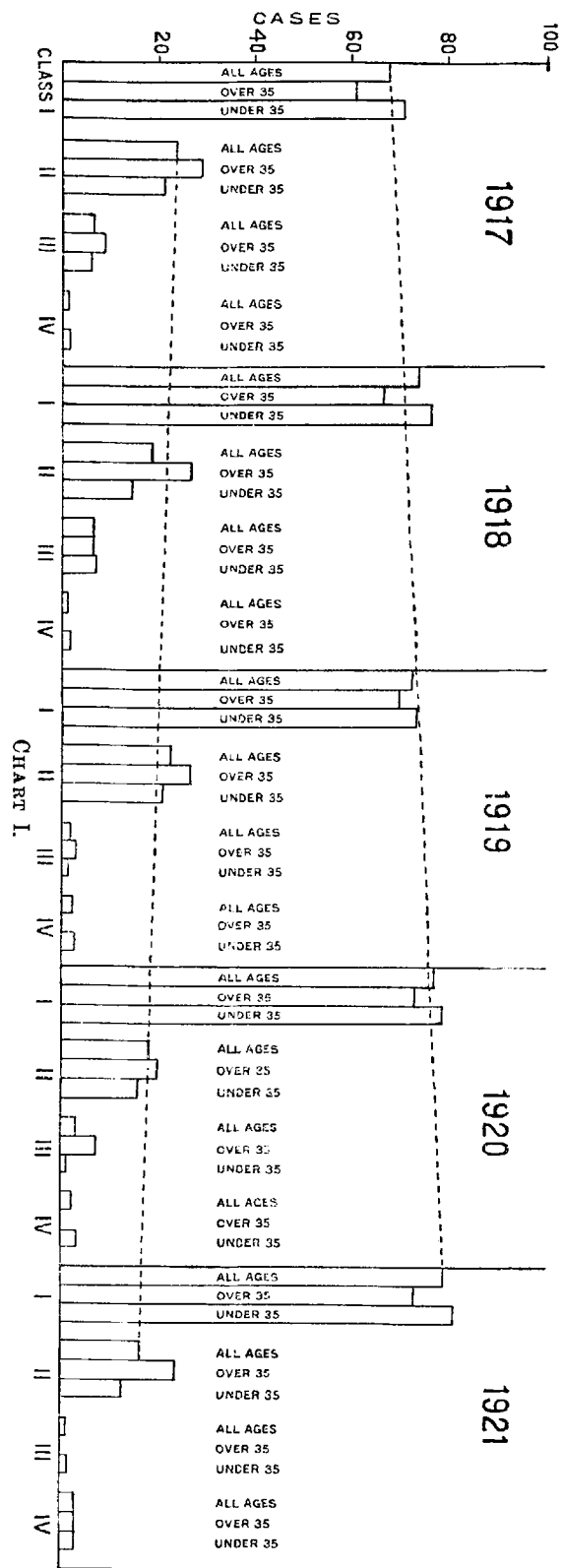
These figures again indicate the better outlook in patients under, as compared to over, 35 years of age. Thus it will be noted that, whereas at the end of the first twelve months from the onset in patients under 35, 71.2 per cent. fall under Class I, and at the end of $4\frac{1}{2}$ years as many as 81.7 per cent.—in men over that age these corresponding figures are only 61.8 per cent. and 73.5 per cent.

The accompanying chart (I) is an attempt to express graphically the figures contained in Tables III, IV, and V. The chart is divided under 5-year headings from 1917 to 1921, the state of the cases at the end of each year named forming the basis of the chart, with the exception of 1921, for which year the state has only been followed up to June or July. Under each year heading are four groups of three columns each. The first group of columns shows the cases falling under Class I, the second in Class II, the third in Class III, and the fourth in Class IV. Of the three columns in each group the first is compiled on the actual figures for cases at all ages as shown in Table III. The numbers represented by the height of the columns can be read from the scale to the left. The second and third columns show the condition of cases over and under 35 years of age respectively, these being calculated as a percentage of the total number in each group as in Tables IV and V.

The interesting features of the chart are the progressive, though slow, increase in the height of the columns representing Class I, and the corresponding decrease in height of the columns standing for Class II, also the general preponderating height of the under 35 column in Class I over that for cases over that age, and the reverse arrangement under Class II. The significance of these points has been remarked on in considering the tables from which the chart is drawn.

In Chart II an attempt has been made to represent graphically the duration of convalescence at all ages and in the age groups already described. In the plotting of the charts, the 97 cases described above, in which death had not taken place, were used, to which were added the three next in sequence in the case sheets, so as to bring the total up to 100. It is to be remarked that of cases at all ages about 40 per cent. have completed their convalescence at the end of six months and about 70 per cent. by the end of one year from the onset. Furthermore, it is noteworthy that from the end of twelve months on to the termination of the time of observation, the curve tends to become parallel with the base-line, indicating, as pointed out above, that in those cases in which recovery is not complete by the end of twelve months, there is an overwhelming tendency for the condition to become chronic. The unfavourable effect of advancing age on the course is again clearly shown by the relative position of the curves for cases over and under 35 years of age. These curves are plotted on the percentages of the numbers of the cases falling in each of these age groups.

The condition of those cases still in receipt of a pension, as shown by notes taken at their more recent boards, suggests that the condition was in course of becoming of that type usually classified as 'chronic Bright's disease', or that this stage had already been reached. Thickening of the arteries, anaemia, and polyuria are frequently noted; the specific gravity of the urine, when mentioned,



is low, from 1,001 to 1,006; albuminuria is frequently stated to be present, but usually only to a slight degree; puffiness of the eyes and occasional swelling of the ankles are frequently commented on. It is interesting that, although an atheromatous condition of the arteries is definitely noted to be present in a large proportion of the cases, the blood-pressures, where recorded, are not high. The highest mentioned is 165 mm. Hg, but for the most part they run from 135 to 145 mm. Hg. So far as this evidence goes, it suggests that the arterial thickening preceded the increased blood-pressure and did not occur as a result of it.

In twenty-five cases, in which the notes were fairly full, the relative frequency of occurrence of the symptoms most often commented on was as follows:

Arterio-sclerosis	11
Oedema (including puffiness under eyes, &c.)	9
Albuminuria	7
Specific gravity of urine under 1,005	5 (of only 5 cases in which estimated)
Cardiac enlargement	2
Accentuated second heart sound	2
High-tension pulse	2

An attempt to ascertain if any particular symptom at the onset or during the acute stage had any marked effect on the prognosis was quite without result. Of two cases in the series which showed clinical evidence of 'uraemia' in the sense of convulsions or coma, both recovered completely and returned to duty within six months of the onset. One was killed in action about eight months from the onset of the nephritis; the other, who, while in a comatose condition, had 120 mg. per 100 c.c. of urea in his blood, was wounded in action about one year from the onset of the nephritis and is now in receipt of a pension for his wound. The three cases that ended fatally were of the most diverse types—two were clinically mild, when seen in France. One of these gave a history of a previous attack of renal disorder; the other had a curious oedema, localized to the scalp, and showed only a slight albuminuria and only traces of blood in the urine; this was the case in which the determining cause of death was scarlet fever. The third case was clinically severe, of the so-called 'lower tract' type, with much oedema, albuminuria consistently to the extent of over 1.2 per cent. (Esbach), and intense haematuria. Of the cases which rapidly recovered, some were clinically severe at the onset, others quite mild, and exactly the same applied to those which ultimately became chronic. If any generalization can be made, it is that those cases which showed a high degree of albuminuria, to the extent of 1.2 per cent. (Esbach), or over, for over two weeks on end, tended to do badly.

No extended series of figures exist on which the death-rate of all those who have suffered from war nephritis can be calculated. The Ministry of Pensions, however, has been kind enough to estimate the death-rate among those pensioned for the condition, which, it must be borne in mind, is a very different thing from those who have suffered from it. Among nephritis pensioners the approximate death-rate is 24 per 1,000 per annum. Among the civil population of about the age of 35, it is 8 per 1,000 per annum; and among pensioners from all causes, 11 per 1,000 per annum. The expectation of life of pensioners from war nephritis is thus less than half that of other pensioners.

These figures were so interesting, that the Ministry of Pensions kindly undertook a further inquiry, as to the cause of death among nephritis pensioners. It then became evident that less than half such deaths were directly attributable to nephritis. Actually it was found that of nephritis pensioners only 11 per 1,000 per annum died of renal conditions, while 14 per 1,000 per annum died from other causes.

These results were arrived at by the consideration of the causes of death in a series of 346 deaths of nephritis pensioners. These were as follows :

TABLE VI.

From nephritis		163 = 47.1 %
From pulmonary tuberculosis	31 = 8.9 %	
From respiratory conditions other than T.B.	28 = 8.10 %	
From circulatory conditions	54 = 15.6 %	
From other causes (including accident and violence)		113 = 32.6 %
		70 = 20.3 %
		346 = 100 %

The above figures make it evident that a fatal issue, in which the main feature is renal, is by no means the rule in sufferers from war nephritis in its chronic form. In only 47.1 per cent. of such patients is death finally determined by the state of the kidneys. In 32.6 per cent. of cases the outstanding features among the symptoms at the close of life are either circulatory or respiratory. The circulatory disturbances have come to be looked upon as intimately associated with renal disorder—whether in the light of cause or effect—but that respiratory conditions should play so large a part in determining a fatal issue comes as something of a surprise. The large proportion of deaths from pulmonary tuberculosis, which make up 9 per cent. of the total, is particularly noteworthy.

Conclusions.

The following conclusions are drawn from the facts presented above :

1. That 70 per cent. of cases of war nephritis at all ages terminate in complete recovery before the lapse of twelve months from the onset.
2. That the proportion of cases so terminating in recovery is slightly higher under the age of 35 than over that age.
3. That of cases not fully restored to health by the end of twelve months from the onset, the great majority become chronic.
4. That the occurrence of clinical symptoms of 'uraemia' at the onset has no unfavourable significance as regards the later prognosis.
5. That in cases becoming chronic, there is a tendency for a fatal issue to be determined by circulatory or respiratory conditions.
6. That the proportion of deaths from pulmonary tuberculosis among patients in the chronic stage is high.

Although frequent references have been made by many writers to the immediate prognosis in war nephritis, observations on the later course of this

condition are not numerous. Early in the war Osler (1) cautioned against giving too favourable a prognosis. Abercrombie (2) has reported on the after-histories of 171 cases for periods of from twenty-four to thirty-two months from onset; his observed mortality at all ages for that period is 3 per cent., the same as that arrived at above. The after-histories up to one year from onset of 50 of the cases considered above were analysed by the present author (3) in 1918, when the more unfavourable prognosis over the age of 35 was noted, and certain deductions were also made as to the influence on the prognosis of the date of disappearance of oedema and albuminuria. Howard-Tasker (4) observed 37 cases up to seven months from onset; he found that by that time 50 per cent. had recovered; another 25 per cent. might still do so, while the remaining 25 per cent. had developed chronic nephritis.

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