concerning it. A number of patients who are going to make uninterrupted recoveries have very slow pulse rates; indeed, it is quite impossible to tell from the initial pulse rate alone what the prognosis of the case is going to be. It is true that a very slow pulse rate is a danger signal, but it can very well be a false alarm.

A.—Pulse rate on admission of a series of fatal cases: 64, 88, 96, 80, 60, 56, 140, 54, 88, 50.

B.—Pulse rate on admission of a series of recoveries: 88, 72, 76, 58, 140, 80, 72, 64, 68, 50, 76.

An interesting point is the fact that a very slow pulse rate may develop after the first few days and remain during the period of recovery. In children, in particular, the initial rate is fast, whilst in adults primary shock, a condition seen in purity only in uncomplicated head injuries, will equally cause a rapid pulse. On the whole, slow pulse rates are seen during the first few hours more commonly in the fatal cases than in others. There is, however, a very interesting phenomenon to which I wish to call attention, and that is secondary bradycardia setting in towards the end of the first week and continuing during the second. This has been a not uncommon finding in the present series, and is due to reactionary oedema. Often enough the patients during this phase have been entirely conscious, and apart from the bradycardia their condition has given rise to no alarm. Sometimes they have had very severe headache, but not necessarily so; sometimes no more than a feeling of fullness or oppression in the head has been experienced. We have often kept a patient back in hospital on account of his slow pulse when he has felt well and pressed for his release, and then, no untoward signs having developed, he has finally been allowed to go. It might be assumed that in all such cases with secondary bradycardia the cerebro-spinal fluid pressures would be elevated, but in three separate cases with pulse rates of 56, 48, 54, the cerebro-spinal fluid pressure registered 11, 10, 11 cm. respectively—that is, entirely normal readings. The accompanying chart (Fig. 2)

FIG. 2.—Time in half-days.

illustrates secondary bradycardia continuing over several days in a patient making a perfect clinical recovery, and this chart could be duplicated many times from our material.

In conclusion, I believe that the classification of head injuries on a basis of stupor is a more correct method than that which categorizes the cases according to evidences of fracture. This alteration I have made tentatively to-day. Signs of local contusion must be carefully looked for and recorded, whilst every effort is made to distinguish the epiphenomena, the alterations in behaviour and clinical state induced by the laying down of another condition—local compression by subdural or epidural haematoma on the " basic state " of general contusion.

I must express my indebtedness to Mr. G. F. Rowbotham and Mr. R. J. C. Maxwell for the trouble they have taken in helping in the search of hospital records.

ULCERATIVE COLITIS

A SURVEY OF NINETY-FIVE CASES

BY

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The disease known as ulcerative colitis, first clearly differentiated from other forms of colon ulceration by Hale-White in 1888, is a severe inflammatory disorder of the colon, in whole or in part. Clinically it is characterized by rectal discharges of blood, mucus, and pus, and is accompanied by constitutional disturbances such as fever, secondary anaemia, loss of weight, and prostration in varying degrees. A prolonged course, with marked tendency to relapse, completes this brief definition of a disease which, despite much endeavour, remains obscure in its aetiology, uncertain in its course, and fickle in its response to treatment.

Though perhaps of infrequent occurrence in the practice of the individual, the condition is common enough in the medical wards of our hospitals, and constitutes one of the outstanding problems of present-day practice. The often insidious nature of the onset, the slow progression with the late appearance of toxic symptoms, the apparent clinical recovery in certain cases with relapse sooner or later, encourage a false sense of security and obscure the potential dangers of this malady. It is useful in such a disease to avail oneself of the records of a large general hospital over a number of years, and thus obtain a composite picture beyond the experience of the individual. Such a survey has been attempted and the results embodied in this paper, particular attention being paid to the life-history of the disorder. So far as we are aware a series of figures comparable to our own has not appeared within recent years in the medical literature of this country, with the exception of a valuable and exhaustive paper by Hern.[1]

No attempt has been made in the present communication to contribute to the vexed question of aetiology, but it may be said that our records give no support to the view, now generally discarded, that ulcerative colitis is a phase of bacillary dysentery. On the other hand, the alleged specificity of Bargen's diplo-streptococcus has yet to be proved, and his special serum is still in the early days of its trial in this country. We are not in a position to make any observations on these two points from our case records. On reviewing the literature it would appear that, apart from the introduction of methods of precision such as the sigmoidoscope and more recently the opaque enema in diagnosis, little has been added to our knowledge of this disease during the present century, so that the earlier contributions to the subject by Hale-White,[2] Allchin,[3] and Hawkins,[4] among others, require little or no modification with the passage of time.

SCOPE OF INQUIRY

The material on which this paper is based has been derived in the main from a systematic search of the records of the General Hospital, Birmingham, for the period January, 1920, to October, 1932. Apart from a few patients who came under our observation in private practice, the series is a consecutive one, and represents the experience of a general hospital of some 500 beds. During the period under review 104 patients were admitted to hospital with ulcerative colitis, and as a result of inquiry, either by personal interview or by report

from the private doctor, or in response to a questionary, the subsequent histories of ninety-five of these patients were obtained, and form the basis for our analysis. Nine patients only remained untraceable.

Classification of the Types of the Disease

For the sake of convenience and comparison we have with slight modification adopted the classification used by Hern.[1] The high mortality during the first year, in striking contrast with subsequent years in our series, made a special group of these cases desirable.

Group A.—Cases ending fatally during the first year.

Group B.—Cases characterized by intermittent attacks with complete freedom from symptoms between.

Group C.—Chronic non-intermittent cases.

Group D.—Irregular cases: (1) intermittent type becoming continuous ; (2) seen in one attack only.

Analysis of Material

The total number of cases was ninety-five, the sexes being equally divided into forty-eight males and forty-seven females. There were thirty-one deaths in all, seventeen occurring among the males and fourteen among the females. Figs. 1, 2, and 3 show the age and sex

Age and Sex Incidence. Shaded portions indicate Deaths.

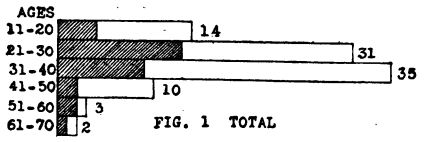


FIG. 1 TOTAL

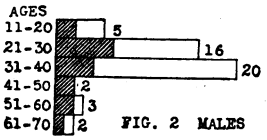


FIG. 2 MALES

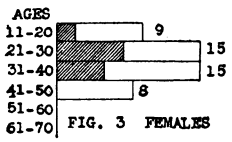
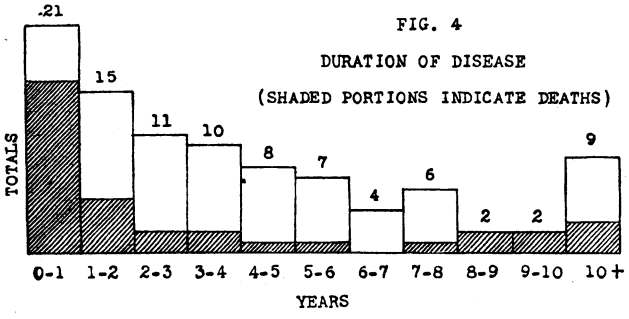


FIG. 3 FEMALES

incidence with the mortality. The age has been taken as the age at the onset of the disease, not infrequently a considerable time before the patient came under observation. It will be observed that the main incidence of the disease lies between the ages of 21 and 40 in both sexes, and here also is found the greatest absolute and relative mortality, especially in the third decade.

Duration of the Disease

This has been calculated in the survivors from the onset of the disease to October, 1932, and in the fatal cases from the onset until death. The shortest duration was six weeks in a fatal case, while at the other extreme was



a patient with the intermittent type, who succumbed in an attack after thirty-six years. One-half of the total number of deaths occurred in cases of less than one year's standing. The survival rate is much improved after the first year, and even more so after the second ; thus the mortality in the first year's series was 75 per cent., after the second year 33 per cent., and in the remainder 17 per cent. The increase in the number of deaths in the later age periods is explained by the occurrence of fatal relapses in cases which appeared to have made a complete recovery. A knowledge of the cause of death in all persons who have had ulcerative colitis might show the disease in an even worse light ; in one of our cases a fatal relapse occurred after fourteen years of normal health, while another patient, already referred to, died of the disease after an intermittent course of thirty-six years.

Health of Survivors

In the assessment of the after-results of the cases in our series we have again adopted the grouping of Hern, and have tabulated our results as follows:

Good means complete restoration to health.

Fair means complete recovery interrupted by later relapses.

Moderate means much disability associated with a persistence of obvious symptoms with or without definite relapses.

Bad means persistence of symptoms with more or less invalidism.

Figs. 5, 6, and 7 show in graphic form the results of survival in the whole series, and also in Groups B and C. Group D is too small to be of value for our purpose. It will be seen that Group B, the intermittent type, although with only a slightly smaller mortality than Group C, had a considerably larger proportion of good and fair results.

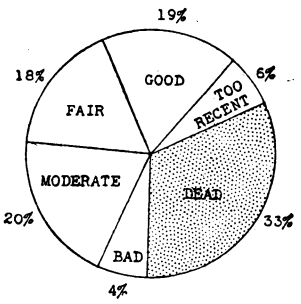


FIG. 5.—Results in survivors. Total, 95 cases.

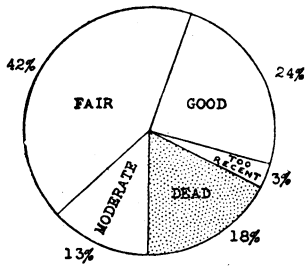


FIG. 6.—Type B. 33 cases. (Intermittent.)

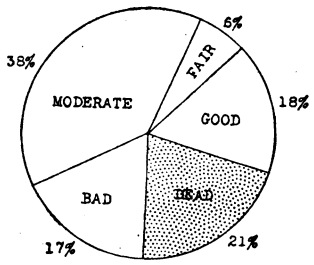


FIG. 7. — Type C. 34 cases. (Non-intermittent.)

Relation of Type of Onset to Duration of Disease

Ulcerative colitis comes before us in varying guise: now a short, severe illness suggestive of, and frequently attributed to, food poisoning ; now a long and continued illness, often with so insidious an appearance that one is tempted to regard this type as of a different nature from the acute form. Yet the clinical features are identical, and the one is but a slow-motion picture of the other.

Our case records were, unfortunately, not complete enough to allow of the type of onset to be determined in every instance, but of sixty-nine cases in which this information was forthcoming an acute onset was noted in fifty-one and a gradual onset in eighteen. Of the fifty-one cases with acute onset nineteen died, and out of the eighteen with gradual onset there were three deaths in the period under review. It was noteworthy, too, that of these twenty-two deaths thirteen occurred within the

first year and were acute cases in all but one instance. The period of survival in these twelve was: one month, three cases ; two months, four cases ; three months, two cases ; four months, two cases ; five months, one case. Thus the prognosis in cases with an acute onset appears to be materially graver than in those with more gradual development.

Treatment and its Results

The treatment of ulcerative colitis is disheartening and confused, the numerous methods available indicating the uncertainty which prevails as to the best course to adopt. Indeed, it is difficult to avoid the somewhat cynical conclusion that most patients with this disease who get well do so in spite of their treatment. The following abstract from a letter dated October 3rd, 1932, from an experienced general practitioner in answer to our inquiry affords an apt commentary on the present position, and is in no way peculiar.

"I am writing to you with reference to Miss F., a patient 37 years of age, who had had severe ulcerative colitis for three months when first she came under observation in January, 1930. From January to May, 1930, she was in the General Hospital, and was treated with the usual expectant measures and polyvalent anti-dysenteric serum in big doses. She returned home and remained in bed very ill, passing frequent stools containing blood, mucus, and pus, for practically a year—that is, until May, 1931. By this time she had wasted until she was almost a skeleton, could not lift her limbs nor do anything for herself, and when I left her to go on my holiday I thought I should not see her alive again. But she slowly improved, and by the summer of 1931 was able to go out in a bath-chair. By the autumn she was able to stand, and weighed then just 6 st. She now weighs (at the time of writing) 11 st. 8 lb., and is able to do a full day's work as a clerk at Messrs. ———. Her recovery has been little short of a miracle, and it is difficult to speak of it without apparent exaggeration. Treatment has been symptomatic only, and there are no discoverable sequelae."

The general treatment of the disease has been similar to that elsewhere: prolonged and complete rest in bed ; a well-varied, bland, and non-residue diet with high calorie and vitamin content ; colon lavage with various substances, bland and medicinal ; charcoal, china clay, and other symptomatic remedies by mouth. This treatment we have designated the expectant, and its results are graphically shown in Fig. 8. In twenty-one cases, in addition to expectant measures, polyvalent anti-dysenteric serum was administered intensively on the lines suggested by Hurst ; the results are seen in Fig. 9. Surgical treatment was carried out in twenty-five cases, appendicostomy being the operation of choice, but caecostomy occasionally of necessity (Fig. 10). The immediate mortality was high, eight dying within ten days of the operation and the other three deaths occurring six, eight, and fourteen months respectively afterwards. The longest period of survival so far is ten years.

Results of Treatment

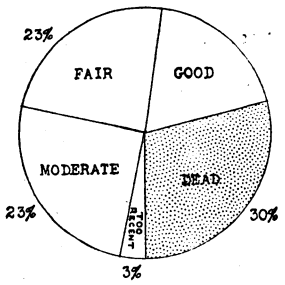


Fig. 8.—Expectant. 47 cases.

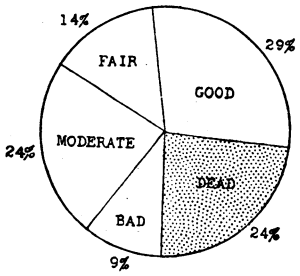


Fig. 9.—Anti-dysenteric serum. 21 cases.

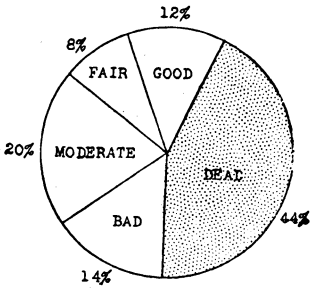


Fig. 10. — Appendicostomy and caecostomy. 25 cases.

It is difficult to say what the exact indications were for the adoption of the respective lines of treatment, but they appear to have been determined more often by individual preference than by any exact clinical indication. Comparison of the three groups is fraught with fallacies: a mild case would not be deemed a subject for vigorous measures ; a more severe case would receive additional treatment ; while a case doing badly might call for operation, such as appendicostomy, as a forlorn hope. This will account to some extent, at any rate, for the high mortality occurring in the surgically treated group of cases, and it would be unfair to draw any inference from the figures. The highest proportion of good results occurred after serum treatment, and the mortality in this group was lower than in the expectant group. It will further be noted that there were 9 per cent. of bad results among the serum-treated cases, and that the proportion of fair and moderate results among the survivors was lower than in the expectant group.

An experience of the disease and study of the literature must lead to considerable doubt as to the value of any particular line of treatment, even the time-honoured colon lavage being open to criticism. In our experience in the early and active stage of ulcerative colitis it may prove definitely harmful ; for, however bland the fluid and however skilfully it is administered, contraction of the colon is bound to occur with greater or less discomfort to the patient. We have been impressed with the immediate improvement occurring in many cases when colon lavage is discontinued.

The basic principles of treatment are absolute and very prolonged rest in bed for a minimum period of six months, a well-varied diet of high calorie and vitamin content, the judicious use of opium to control an exhausting diarrhoea, and the provision of an adequate supply of fluid to the tissues by mouth, rectum, or intravenously as occasion demands. We are not convinced that serum treatment or surgical intervention has materially improved the outlook of this disease, though brilliant results with either are within the experience of everyone.

Finally, we would especially emphasize two facts: that recovery in ulcerative colitis is invariably slow and rarely complete ; and, secondly, that there are few diseases in which a patient can reach such a state of emaciation and exhaustion and yet recover. Patience is requisite and hope justifiable in quite unusual degree.

Conclusions

1. A survey has been made of ninety-five cases of ulcerative colitis coming under observation between January, 1920, and October, 1932. The sexes were represented equally.

2. The disease is essentially one of adult life, the main incidence falling in the age period 21–40 in both sexes.

3. One-third of the patients died during the period under review.

4. The highest fatality rate occurred in the age period 21–40.

5. The mortality during the first year is high (75 per cent.), and thereafter diminishes rapidly with every year of survival.

6. The most unfavourable type of the disease is that showing an acute onset, and the least unfavourable is that characterized by intermittent attacks with complete freedom from symptoms in the interim.

7. Various methods of treatment have been briefly reviewed.

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[2] Hale-White, W.: Ibid., 1888, xix, 131.
[3] Allchin, W. H.: *Proc. Roy. Soc. Med.*, 1908–9, ii, Pt. II, 59.
[4] Hawkins, H. P.: *British Medical Journal*, 1909, i, 767.

TREATMENT OF CHOREA BY INDUCED PYREXIA

BY

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The present aim of treatment in Sydenham's chorea may be summarized in a single word—rest. The heart is involved in such a high proportion of cases (50 per cent.)[1] that a minimum of three months' rest in bed has been arbitrarily fixed in all cases, whether or not there is clinical evidence of carditis.[2] Unfortunately it is impossible to attain complete rest in these cases owing to the persistent spasmodic movements. Sedatives of various kinds are used in order to control as far as possible these movements. Of these aspirin, chloretone, and nirvanol have been most extensively used, the last-named having now been abandoned as dangerous.

It was suggested in 1931 by Sutton[3] that instead of the present expectant methods of treatment active measures should be adopted to cut short the attack of chorea. The method she advocated was the induction of artificial pyrexia by T.A.B. vaccine. She claimed that by producing a temperature of 103° to 106° F. each day for seven to ten days the choreic movements are brought to an abrupt conclusion, and the child can be allowed up about two weeks after the commencement of treatment. Granted the truth of these claims, there is yet a very important part of the clinical picture upon which the effect of the treatment must be observed before any conclusion can be drawn as to the efficacy of the method. I refer to the cardiac complications. It might reasonably be supposed that a constitutional disturbance such as is produced by this treatment might have an adverse effect upon the heart, which in so many cases is already affected. Before the method can be generally adopted, therefore, it must be clearly shown that the induction of a temperature of 103° to 106° F. for ten days will not accelerate any existing carditis. This aspect of the problem, not mentioned by Sutton[3] or Bateman,[4] has been given special consideration in this article.

TECHNIQUE

This consists in the daily intravenous administration, for a period of seven to ten days, of T.A.B. vaccine in sufficient quantity to produce a temperature of 103° to 106° F. The vaccine contains in 1 c.cm. *B. typhosus* 1,000 million, *B. paratyphosus* A 750 million, and *B. paratyphosus* B 750 million. The initial dose is 0.1 c.cm. intravenously, which almost invariably produces a satisfactory response. There is a severe constitutional reaction. The patient vomits and develops a peculiarly cyanosed appearance. The choreic movements are markedly increased for the time being. Subsequent doses are increased in accordance with the response to the first injection. An approximate rule is to double the previous day's dosage on each day. The final dose may be as much as 2.5 c.cm. Sutton recommends the administration of aspirin and an ice-bag to the head if the temperature rises above 106° F. With careful attention to dosage, however, this is a rare incident, and did not occur at any time in my series of cases. The injection is given in the early afternoon to enable the subsequent reaction to subside before night, and thus not to interfere with the child's sleep. The constitutional reaction becomes less marked with each injection, until the final injection produces no obvious reaction apart from the pyrexia.

REPORT OF CASES

As space will not permit of the detailed description of all the cases, I have chosen as examples those which appear to throw most light on the subject. The cases have been divided according to Sutton into mild, moderate, and severe. (1) *Mild cases:* Those in which there was occasional twitching of the limbs and face, but no hypotonia or speech disturbance. (2) *Moderate cases:* Frequent gross choreic movements of limbs, trunk, and face, with some disturbance of speech. (3) *Severe cases:* Those in which the movements were so severe and the hypotonia so marked that the child was unable to perform any voluntary movement whatever.

Case 1.—Aged 11 years. History of rheumatism and chorea four years previously. On admission, a typical chorea of moderate severity. Heart sounds normal. Intravenous T.A.B. vaccine in increasing dosage given for seven days. At the end of this time there was marked improvement, there being practically no evidence of chorea. The heart sounds were still normal. Eighteen months later the mother says she has been quite well since discharge. There is no evidence at the moment of any rheumatic manifestation, and the heart sounds remain normal.

Case 2.—Aged 8 years. Admitted on January 5th, 1932, with one week's history of twitching of arms and legs and incoherent speech. No previous history of chorea. On examination the child presented the picture of a severe case of chorea. Heart sounds were normal. A series of nine injections was given, with satisfactory pyrexial response. The movements were diminished at the end of this time, but were still fairly well marked. The patient was kept in bed for two weeks, during which time the movements became slightly worse. A second course of seven injections was therefore given. At the end of this the movements were very slight, and disappeared entirely within a few days—that is, during the sixth week from the onset of the attack. Fifteen months later the child is well, has had no recurrence, and has no evidence of valvular disease of the heart.

Case 3.—Aged 5 years. Had chorea in January, 1930, and was admitted on November 24th, 1931, with a recurrence. Choreic movements of moderate severity. No clinical evidence of cardiac involvement. A series of eight injections was given ranging from 0.1 to 1.5 c.cm. At the end of this time the choreic movements had almost disappeared. The patient was kept under observation for three months, at the end of which time she was again admitted to hospital with a recurrence. T.A.B. treatment was not given on this occasion, and under the usual sedative treatment all movement ceased after a further two months. Now, eighteen months after the treatment with T.A.B., she is in the throes of yet another attack. The heart sounds are still normal.

Case 4.—Aged 10 years. Admitted on January 14th, 1932, with a mild attack of chorea. Previous history of acute rheumatism in June, 1930. Heart enlarged. Blowing mitral systolic murmur conducted towards the axilla with rough mitral diastolic murmur. After a course of seven injections of T.A.B. the choreic movements were no longer in evidence. In view of his heart lesion he was kept under observation at a convalescent home. He was readmitted to hospital on May 26th, 1932, with severe chorea and acute pericarditis. The heart enlarged progressively, and death occurred on July 10th, 1932.