second transfusion. The original transfusion of 5 pints of blood within 36 hours at the time of wounding can be regarded as a single antigenic stimulus. It is of comparative interest that Cappell (1948) has found that the first recorded manifestation of haemolytic disease of the newborn due to Rh incompatibility is usually one of the severer forms, contrary to the widely held belief that the first one or two affected children in a family show only mild symptoms.

Unfortunately, the volume of incompatible blood transfused in the case is not known with certainty, but the late Dr. Douglas Macrae, of the Edinburgh Blood Transfusion Service, informed us that at the time of the transfusion it was the practice to screen all Group O donors with a diagnostic anti-D serum, and, as it is certain that blood specifically marked Rh-negative was not given to this patient, the probability is that 1,600 ml. of incompatible Rh-positive blood was given. Bordley (1931) stated that cases receiving larger volumes of incompatible blood tend to be more serious—a conclusion with which Muirhead *et al.* (1948) are in general agreement. On the other hand, one of us (J. W.) has recently seen a Group O patient who had only a transient haemoglobinuria following a transfusion of 4 pints (2.27 litres) of Group A blood and did not develop renal failure. The anti-A titre of this Group O patient's serum four weeks after transfusion was 512,000. The probability is that several factors play a part in producing renal failure in such cases, the most important being renal anoxia (Maegraith *et al.*, 1945).

3. Compatibility Tests

The direct compatibility test in which the patient's serum is set up against saline suspensions of red cells will fail to detect the presence of blocking antibodies. To detect such antibodies the red cells must be suspended in AB plasma or preferably in 20% bovine albumin solution (Mourant, 1948). There is of course no proof that in this case blocking antibodies would have been detected in the patient's serum *before* transfusion. These antibodies may disappear after the original sensitization, but can be produced again very rapidly following the appropriate antigenic stimulus.

The two most important lessons to be learned from this case are : (i) always to determine the Rh blood group of any patient previously transfused, and (ii) the so-called compatibility test is not an absolute safeguard against incompatibility.

4. Survival of the Patient

Many forms of therapy have been advocated in the treatment of haemolytic transfusion reactions—e.g., alkaline therapy, forced fluids, transfusion of compatible blood, splanchnic block, and decapsulation of the kidney (Kilduffe and De Bakey, 1942)—but opinions differ on the value of these methods. Few observers are in a position to study a large controlled series of such cases, and this renders assessment of a particular form of therapy difficult. According to De Gowin (1938) some patients recover spontaneously, while others die in spite of the therapeutic measures advocated. The present case illustrates that even severely damaged kidneys may recover completely without any heroic therapy.

Summary

A severe degree of renal failure from which the patient subsequently made a complete recovery occurred after a blood transfusion.

The transfused blood appeared to be compatible when tested against the patient's serum.

On investigation the patient, who had been transfused previously as a war casualty, was found to be Rh-negative and to

have rhesus antibodies of the incomplete, blocking, or albumin-agglutinating variety in his serum.

The importance of determining the Rh group in any patient previously transfused, and the danger of relying on the direct compatibility test only, are stressed.

The clinical features and treatment of haemolytic transfusion reactions are discussed.

We wish to thank Dr. W. M. McAlister, medical superintendent of Bangour Hospital, for permission to publish this case. We also acknowledge with thanks the help received from Dr. I. A. Purdie in the biochemical investigations and the helpful co-operation of Mr. A. B. Wallace, who was in charge of the case.

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DYSENTERY IN SOUTH PERSIA

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The control of this group of diseases, apart from the relief of the patients' discomfort, is of importance because they are productive of much time-wastage and inefficiency, matters of outstanding interest to a commercial concern. Moreover, the opportunity of identifying and segregating the patients who continue to be infective after apparent recovery will bring about a steady reduction in the incidence of the dysenteries in the province of Khuzistan, South Persia.

Accordingly arrangements were made in March, 1947, for all cases regarded as dysenteric, either on clinical grounds or from the initial examination of the stools in the laboratory, and arising among the company's 30,000 male artisan employees on Abadan Island, to be admitted to the Isolation Hospital, a segregated wing of which was allocated for this purpose. The project had been under consideration for two years but had been delayed by the restricted supplies of sulphaguanidine. The arrival of a hundredweight (50 kg.) of this drug in March was followed by the opening of a forty-bed ward on April 1, and the figures subsequently quoted relate to the admissions between April 1, 1947, and April 1, 1948.

The survey relates to a permanent and static civilian population and therefore has a value greater than that of a survey of the same diseases during the conditions of war, when large masses of population are moved into abnormal sites and situations. Apart from its local value it has a bearing on the steadily increasing flow of short-term visitors of all nationalities drawn to the Persian Gulf by its

growing commercial importance. A proportion of these visitors will no doubt develop intestinal disturbances after leaving the area, and the rarity of amoebiasis in this particular area, shown in Table I, makes it unlikely that this disease will need serious consideration.

TABLE I.—*Diagnosis*

Amoebic dysentery in which vegetative <i>E. histolytica</i> was the sole agent found	52
Cases failing to respond to sulphaguanidine and in which <i>E. histolytica</i> was found later	2
Cases failing to respond to sulphaguanidine and treated as amoebic dysentery without proof	1
Balantidial dysentery in which <i>Balantidium coli</i> was the sole agent found	13
Pure bacillary infections:	
<i>B. dysenteriae</i> Flexner	353
" Schmitz	49
" Sonne	97
" Shiga	19
" Boyd	22
Mixed dysentery:	
<i>E. histolytica</i> and Flexner	3
" and Boyd	2
<i>Balantidium coli</i> and Flexner	2
" and Sonne	2
Bacillary type cases with negative culture responding to sulphaguanidine	698
Admitted late without laboratory investigation and responding to sulphaguanidine	115
Total	1,430

Table I is devoted solely to the dysenteries, the irrelevant admissions having been excluded. Such diverse conditions as diverticulitis, carcinoma of the colon, constipation, the acute diarrhoea of aestivo-autumnal malaria, and many more have inevitably arrived in the ward from time to time and have been redirected to the appropriate departments.

Proved amoebic dysentery therefore accounted for only 3.8%, whereas proved bacillary infections accounted for 37.3%, and 56.6% were of bacillary type but unproved. Balantidial and mixed dysenteries account for the balance.

The following facts are in favour of the bacillary origin of the cases in which no pathogen was seen or isolated: (1) A clinical side-room with a competent technician has been in existence close to the dysentery ward for four months and all cases slow in responding to sulphaguanidine have been reviewed. In only one case has *Entamoeba histolytica* been found. (2) The frequent use of test purges in these cases without result. (3) The absence of Charcot-Leyden crystals, the mucoid nature of the stools, and the characteristics commonly found microscopically in cases of bacillary dysentery. (4) The headache, the fever, and a colic relieved completely by the passage of a stool.

TABLE II.—*Carriers**

Organism	Carriers	Total Recorded	Percentage of Total
<i>B. dysenteriae</i> Flexner	21	358	5.9
" " Sonne	8	99	8.1
" " Schmitz	2	49	4.1
" " Shiga	1	19	5.3
" " Boyd	3	24	12.5
Total	35	549	—

* The medium used was SS ("difco") desoxycholate citrate agar adjusted to pH 7.

Table II resulted from the following procedure: Each case was detained in hospital for two days after sulphaguanidine therapy had ceased, the next stool passed was cultured, and the patient was discharged without waiting for the result. Those cases found to be positive were readmitted and given a course of 100 g. of the drug; all cases were then found to be free of infection. Multiple cultures would no doubt have revealed even more carriers, but the retention of so many recovered patients for six or seven days would not only have given rise to great discontent among the patients but added a further volume of work to the laboratory and put extra pressure on bed accommodation.

Treatment

Amoebic Dysentery.—All cases were given 4 g. of sulphaguanidine four-hourly, including the night hours, to a total of 20 g. Emetine hydrochloride in a dose of 1 gr. (65 mg.) was given daily for ten days and was followed by a five-day course of 0.25 g. of quinoxyl by mouth three times a day, and a retention enema of 5 g. in 200 ml. of saline each evening. Seven of the 54 cases were readmitted with a relapse in the course of the year.

Bacillary Dysentery.—Sulphaguanidine, 4 g. four-hourly, was given day and night until the patients were afebrile and symptomless. Table III shows the quantities required.

TABLE III.—*Sulphaguanidine Dosage*

Group	20 g.	40 g.	60 g.	80 g.	100 g.	120 g.	140 g.	Total
Flexner	116	87	50	58	24	17	1	353
Sonne	43	28	8	16	2	—	—	97
Schmitz	15	17	8	7	2	—	—	49
Shiga	11	5	3	—	—	—	—	19
Boyd	15	5	1	1	—	—	—	22
Clinically bacillary	364	181	98	41	10	4	—	698
No lab. investigation	66	24	14	4	7	—	—	115
Total	630	347	182	127	45	21	1	1,353

Expressed in units of 20 g., the average requirement of each group is as follows: Flexner, 2.5; Sonne, 2; Schmitz, 2.3; Shiga, 1.6; Boyd, 1.7; clinical dysentery, 1.8; no investigation, 1.8.

Complications.—The only major complication worthy of record is acute hepatitis, which may or may not have been amoebic in origin, ten cases developing while in hospital. One of them was admitted with a Sonne infection and one with a Flexner. The remainder had negative stool cultures. In none had amoebae or cysts been seen in the stools, but all responded satisfactorily to emetine.

Mortality.—No death occurred in the series. Two individuals who were not employees died with bacillary dysentery as a terminal event, one being a case of advanced rheumatoid arthritis and the other an old man with prostatic hypertrophy and acute retention.

Summary

An organization for the control of dysentery in a large industrial population is described, the frequency of the different forms assessed, and an analysis made of the quantities of sulphaguanidine required in the different bacillary types.

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The Minister of Food has made the Mineral Oil in Food Order, 1949, which came into force on April 9, prohibiting the use of mineral oils in the manufacture of food for sale to the public. The Ministry states that for some time past the Ministries of Food and Health and the Department of Health for Scotland have been concerned both on medical and nutritional grounds about the growing practice of using paraffins in the preparation of food. The Ministry also urges housewives not to use these substances in home cooking. The statement says that deposits of medicinal paraffin would not, so far as is known, be harmful in themselves, but the same could not be said for other mineral oils, many of which are known to contain harmful substances. "Too little is known about the fate of deposits of mineral oils in such organs as the liver for the medical profession to remain indifferent about them." The risks of consuming liquid paraffin were discussed in a leading article in this *Journal* in 1948, June 12 (p. 1141). It concluded with these words: "On the evidence available, therefore, the use even of refined liquid paraffin (*B.P.*) in the preparation and cooking of food is to be condemned. . . . The internal use of other (unrefined) mineral oils in any shape or form must always be condemned."