GASTRO-ENTERITIS IN GENERAL PRACTICE

A STUDY OF 90 UNSELECTED CASES

BY

W. J. SMITHER, M.D., D.P.H.

The *British Medical Journal* (1951) notes a real as well as an apparent increase in the amount of gastro-intestinal infection. There has also been a steady annual increase in the number of cases of food-poisoning notified. The *Monthly Bulletin of the Ministry of Health* (1951) states, "That better reporting accounts for the whole of the increase is unlikely, and it appears that food-poisoning is still increasing."

It is often said that earlier bacteriological investigation would reveal an increased proportion of specific infections. The Chief Medical Officer to the Ministry of Health says in his report for the year ending March 31, 1950: "The fact that no causal agent could be found in a large number of sporadic cases [of food-poisoning] was because many of these cases were not reported until it was too late for investigation." In the United States Felsen (1945) concluded, *inter alia*, that "when the unclassified infectious diarrhoeas are studied the majority appear to be bacillary dysentery. . . . The reported incidence of bacillary dysentery far exceeds that of any other specific infectious diarrhoea."

That statement holds true for this country, where the picture of bacillary dysentery is acknowledged to be very different from that seen abroad. The number of corrected notifications rose to the record figure of 17,223 in 1950. Of these, 14,085 were investigated bacteriologically, and 96% of this number were due to *Shigella sonnei*. When these figures are compared with the total number of "incidents" of food-poisoning for the same period—that is, 3,979—it would appear that *Sh. sonnei* is the commonest cause of acute diarrhoea. Particularly would this be expected in general practice, where the mild type of diarrhoea is so commonly seen.

For the year ending March 31, 1950, when there were 2,431 incidents of food-poisoning, the Chief Medical Officer reported that "there was evidence that at least 11,000 persons were affected." Even if we allow that the increase in the number of incidents in 1950 was entirely a real increase and in no way due to the new method of reporting, the proportionate number of estimated as opposed to reported persons affected should not rise above the total reported cases of dysentery. Thus the general practitioner should still expect to find that Sonne dysentery is the commonest cause of diarrhoea.

It was decided to test the truth of these assumptions and the value of the statements that early bacteriological investigation would reveal more specific causal agents. A study of unselected cases of acute diarrhoea, with or without vomiting, was felt to be of value.

The Investigation

The method chosen was to investigate bacteriologically by means of rectal swabs every case of acute diarrhoea, with or without vomiting, seeking treatment. From June to November, 1951, inclusive, 74 cases occurred in a general practice in an industrial area near London. A

second group of 16 cases were investigated from mid-December, 1951, to mid-February, 1952, with a slightly different technique. The number considered to be at risk—that is, likely to seek advice—was approximately 7,000. No attempt at selection was made and all acute cases were investigated. Cases of chronic or recurrent diarrhoea were excluded. Rectal swabs were sent to the local laboratory without a provisional diagnosis, and the bacteriological diagnosis quoted is the one arrived at by this laboratory.

Because of criticism of rectal swab efficiency in general practice, the technique was changed for the second group of 16 cases. In these the rectal swab was used to inoculate immediately a bottle of selenite medium, and both swab and inoculum were sent to the laboratory.

The results obtained are shown in the Tables. Following the terminology of the Ministry of Health, a "family outbreak" means two or more related cases in the same family, and a "sporadic case" means a case which had no ascertainable relation to another case. Each family outbreak and sporadic case has been treated as one unit and described as an "incident." The Ministry of Health defines an "outbreak" as the occurrence of two or more related cases in persons of different families. No relationship was observed between any of the sporadic cases reported, so the term outbreak is not used.

Table I shows the incidence by the presumed cause. In the largest group no pathogenic organisms were isolated. All the second series of cases came into this group, making

TABLE I

Presumed Cause	Sporadic Cases	Family Outbreaks	Total Incidents	Total Cases
No pathogens	68	1	69	71
<i>Sh. sonnei</i>	3	4	7	14
<i>Pr. vulgaris</i>	1	1	2	3
<i>Salm. typhi-murium</i> ..	1	—	1	1
Food-poisoning (toxin type)	1	—	1	1
	74	6	80	90

a total of 69 incidents. *Sh. sonnei* was the most frequently isolated specific causal agent—7 incidents comprising 14 cases. *Proteus vulgaris* was the next most frequent—two incidents comprising three cases. *Salmonella typhi-murium* was isolated in only one case.

One family outbreak occurred in the group from which no pathogenic organisms were isolated. There was one family outbreak in the proteus group. This contrasts with the comparatively large number of four family outbreaks of Sonne infection.

Only one case required admission to hospital. This patient was a young woman with high fever whose failure to respond to treatment led to her admission on the third day of the illness. The hospital diagnosis was food-poisoning (toxin type). She recovered in eight days. All the other cases responded rapidly to treatment and yielded negative swabs on the second attempt, except the case from which *Salm. typhi-murium* was isolated. This gave a positive rectal swab one week later. One case, subsequently diagnosed as acute appendicitis, presented as acute diarrhoea.

Table II shows the incidence by age and presumed causal agent. The youngest patient was 4 months and the oldest 74 years. No pathogenic organisms were isolated in the majority of incidents at all ages, but the smallest number of these negative swabs occurred in the group under 1 year. Most cases of Sonne dysentery occurred in the 5–14 years group. Half as many occurred in the 1–4 group, and there was one case in each of the groups of under 1 year and over 14 years. There was one case of proteus infection in the under-1-year group, and a family outbreak comprising

TABLE II

Presumed Cause	Age in Years			
	Under 1	1 to 4	5 to 14	Over 14
No pathogens	6	23	16	26
<i>Sh. sonnei</i>	1	4	8	1
<i>Pr. vulgaris</i>	1	2	—	—
<i>Salm. typhi-murium</i> ..	—	—	—	1
Food-poisoning (toxin type)	—	—	—	1
	8	29	24	29

two cases in the 1-4 years group. The individual case of salmonella infection and that of food-poisoning (toxin type) occurred in adults.

Table III shows the incidence by weekly intervals. Those incidents in which no pathogenic organisms were isolated were fairly evenly distributed throughout the whole period. Incidents of Sonne dysentery were evenly spaced until the beginning of November, after which no further cases occurred. This is not in keeping with the comment of the

TABLE III

Week Ending	No Pathogens	<i>Sh. sonnei</i>	<i>Pr. vulgaris</i>	<i>Salm. typhi-murium</i>	Food-poisoning (Toxin Type)
2/6/51 ..	2	1			
9/6/51 ..	3				
16/6/51 ..	1				
23/6/51 ..	4				
30/6/51 ..	2	1			
7/7/51 ..	4			1	
14/7/51 ..	1				
21/7/51 ..	1				
28/7/51 ..	1	1			
4/8/51 ..	2				
11/8/51 ..	1				
18/8/51 ..	5	1			
25/8/51 ..	1				
1/9/51 ..	—				
8/9/51 ..	3		1		
15/9/51 ..	2		1		
22/9/51 ..	3				
29/9/51 ..	3	1			
6/10/51 ..	—				
13/10/51 ..	1				
20/10/51 ..	—				
27/10/51 ..	3				
3/11/51 ..	4	1			
10/11/51 ..	2	1			
17/11/51 ..	3				
24/11/51 ..	1				
22/12/51 ..	2				
29/12/51 ..	5				
5/1/52 ..	—				
12/1/52 ..	2				
19/1/52 ..	1				
26/1/52 ..	1				
2/2/52 ..	2				
9/2/52 ..	1				
16/2/52 ..	2				

British Medical Journal (1951) that "in this country dysentery, as opposed to food-poisoning, is now almost a winter disease." The incidents of proteus infection occurred together in mid-September, and those of salmonella infection and of food-poisoning (toxin type) in early July.

Discussion

It may be said that there is no justification for regarding those mild cases of gastro-enteritis in which no pathogenic organisms were isolated from rectal swabs as food-poisoning. However, the clinical course, the rapid response to treatment, and the absence of parenteral infection lend support to such a clinical diagnosis. The Chief Medical Officer (1951), noting the increased incidence of food-poisoning, gives three main reasons for that increase. The first is the retention overnight and reheating of meat dishes cooked the previous day for reasons of economy. The second is the great increase in communal feeding in schools, mines, and factory canteens, where such cooking practices are common. The third cause is the lack of personal hygiene. These conditions are so widespread in this area, where domestic refrigerators are rare and food is commonly kept in the

larder or kitchen, that a history of any of the predisposing factors is of little value. Histories are unreliable in isolated cases of food-poisoning.

Only one case, that infected with *Salm. typhi-murium*, gave an unequivocal history. This patient was a woman of 43 who was quite sure that her symptoms followed the eating of a boiled duck egg. The *Lancet* (1951) casts doubt on the role of duck eggs in salmonella infections. It is difficult, however, to get bacteriological proof in the case of a boiled duck egg. There is rarely any of the egg left, and these eggs are not common articles of diet eaten as such in this area. Large numbers are used in cookery, particularly in catering establishments, where they fetch a high price. It seems interesting that in this series the only person who volunteered information concerning the ingestion of suspected food was the sole case of salmonella infection.

The cases of Sonne dysentery reported here were so mild and their response to treatment so rapid that, but for the interest engendered by this study, they might never have been investigated and reported. There were more family outbreaks of this infection than of any other. The group of cases in which specific organisms were isolated was dominated by Sonne infections—14 cases out of a total of 18. This suggests that infection with *Sh. sonnei* is even more common than the numbers of reported cases would indicate.

The presence in this series of one isolated case and one family outbreak of gastro-enteritis in which *Pr. vulgaris* was isolated may or may not be of significance. However, it seems fair to comment that this organism was found more often than *Salm. typhi-murium*, believed by many to be the commonest cause of food-poisoning. The one case of the latter infection noted was so mild that it might easily have passed unnoticed.

There were six infants under 1 year with diarrhoea from whom no pathogenic organisms were isolated. Since no special bacteriological techniques were employed, there is no means of determining whether these were due to a specific strain of *Bact. coli*. No parenteral infection was noted. The numbers compare with two sporadic cases of specific infection under the age of 1 year. In one of these *Sh. sonnei* was isolated and in the other *Pr. vulgaris*.

It is submitted that any of the cases from which no pathogenic organisms were isolated could be due to the heat-resistant enterotoxin produced by certain strains of staphylococci. These organisms may be extinct in the food, and even more probably extinct in the rectal swab, and yet cause symptoms. The ubiquitous distribution of such organisms, and the ideal conditions for toxin production in the common cooking practices mentioned previously, support this view. The one case in which food-poisoning (toxin type) was the final diagnosis presented clinically as a severe gastro-enteritis with marked vomiting and high fever. There was some abdominal tenderness but no other physical sign. The patient was mentally alert throughout to a degree unusual in such a pyrexia. Her failure to respond to home treatment led to early admission to hospital. No pathogens were isolated from the rectal swab, and bacterial investigation in hospital was quite negative. The final diagnosis was therefore a clinical one. This would seem to be an isolated case of unusually severe enterotoxic food-poisoning due to individual hypersusceptibility.

Any of the cases from which no pathogenic organisms were isolated could have been due to a great variety of causes. So far as was possible, many of these causes were eliminated clinically. Most of these other conditions are comparatively rare. One case subsequently diagnosed as appendicitis presented as acute diarrhoea, and one case of adenomatosis of the colon was picked up. Neither of these has been included.

It is realized that more argument than evidence has been adduced to support the belief that most of the cases in which no pathogenic organisms were isolated were due to staphylo-

coccal food-poisoning; what evidence we found is negative rather than positive. Nevertheless it would seem that staphylococcal food-poisoning is the commonest cause of the frequent mild cases of diarrhoea, with or without vomiting, met with in general practice.

Summary

Ninety unselected cases of acute gastro-enteritis, occurring over a period of nine months in an urban practice, were investigated. In by far the greatest number of these no pathogenic organisms were found. The commonest specific organism isolated was *Sh. sonnei*. *Pr. vulgaris* was the next most common. Only one case of infection with *Salm. typhi-murium* was found. One case was subsequently diagnosed in hospital as food-poisoning (toxin type).

Arguments are advanced for the belief that staphylococcal food-poisoning is the commonest cause of mild cases of gastro-enteritis.

REFERENCES

- British Medical Journal*, 1951, 2, 102.
Chief Medical Officer (1951). Rep. Min. Hlth, 1949. Part II, p. 47.
H.M.S.O., London.
Felsen, J. (1945). *Bacillary Dysentery, Colitis and Enteritis*. Saunders, London.
Lancet, 1951, 2, 825.
Monthly Bull. Minist. Hlth, Lond., 1951, 10, 228.

Medical Memoranda

Intra-partum Uterine Rupture

Mr. Hodkinson's article in the *British Medical Journal* of February 9, 1952 (p. 308), on this subject prompts me to record my experiences at the Government Hospital, Gatooma, with similar cases during the past two years. This hospital contains some 250 beds for Africans and about 150 to 200 deliveries take place in it every year. Caesarean section is often carried out, since contracted pelvises, and especially pelvis with contracted outlets, are common. I have averaged about 25 such operations a year during the past five years. Uterine rupture has not occurred in any case in which caesarean section has been carried out, although nearly all these operations have been of the "classical" variety. I attribute this immunity to following the advice of Mr. Victor Bonney to use a layer of non-absorbable sutures in the uterine wall. Our present practice is to use a deep layer of catgut and a superficial layer of nylon. No irritation seems to be set up by the latter, and in a case on which I operated for the second time recently it was extremely difficult to trace the previous scar in the uterus. The following four cases of uterine rupture have been met with.

CASE REPORTS

Case 1.—An African woman aged about 35 was admitted to hospital on January 14, 1950. She had had five previous pregnancies; the first three were normal full-term deliveries of live children, the fourth was a full-term delivery of a stillborn child, and the fifth a four-months abortion. She stated that labour began late in the evening of January 13, and she did not think that the membranes were ruptured. On examination she was shocked and collapsed, and had just come about 40 miles by ambulance over rough roads. No foetal parts could be distinguished through the tense abdomen, and the foetal heart was not heard. Per vaginam there was a foul-smelling discharge, and a shoulder was presenting. The cervix was fully dilated. In spite of all the usual restorative measures the woman died two hours after admission without recovering sufficiently to warrant

active treatment. At necropsy it was found that the uterus had ruptured into the left broad ligament, and that the child was still *in utero*. The patient had lost only about a pint (570 ml.) of blood. Death was obviously due to shock and toxæmia.

Case 2.—This patient, an African woman aged about 25, was admitted to hospital on February 1, 1950. She had had two previous pregnancies, both of which terminated normally in live children. The present labour began the evening before admission. The uterus was tonically contracted, no foetal parts were felt through the abdomen, and the foetal heart could not be heard. Vaginal examination revealed that the cervix was three-quarters dilated and a head could be felt high up at the pelvic brim. There was a large caput and the cervix was hanging loosely below it. The patient was profoundly collapsed and pains had ceased some hours before admission. After the usual shock treatment a laparotomy was performed. A full-term dead foetus was found loose in the abdomen. The uterus had ruptured through its left side behind the broad ligament and the peritoneum contained about 3 pints (1.7 litres) of blood and clots. Subtotal hysterectomy was performed. Convalescence was stormy, but the patient eventually made a complete recovery.

Case 3.—An African woman of about 30 was admitted on May 22, 1951. She had had five previous full-term pregnancies, all of which terminated in easy and normal labours. On examination the child was lying in the L.O.A. position and seemed very large. The maternal pulse rate was 80 and the foetal 96. The foetal head was fixed at the pelvic brim, and a large caput reached nearly to the vulva. A catheter drew off 2 pints (1.1 litres) of very blood-stained urine. It was decided that caesarean section was indicated, and a laparotomy was performed in order to do this. To our surprise the uterus was extensively ruptured through the anterior part of the lower segment. The child was still *in situ*. It was removed by enlarging the uterine hole, and a subtotal hysterectomy was carried out in view of the extensive laceration of the lower segment. The child was dead, but the mother made a good recovery after a stormy convalescence.

Case 4.—This woman, who appeared to be about 40 years old, was admitted on September 30, 1951. She had had ten previous full-term pregnancies with easy labours. She was very collapsed. The foetal parts could be felt with difficulty and the head was palpated in the right iliac fossa. Vaginal examination revealed severe bleeding, and the case was thought to be one of placenta praevia. On laparotomy the peritoneal cavity was found to contain about 2 pints (1.1 litres) of blood and clots.

The child was free amongst the intestinal coils, and the uterus was found to have a large rent through its posterior lower segment. The child was removed, dead, and a subtotal hysterectomy was performed. Apart from some trouble with atony of the bladder—a common difficulty in post-partum African cases—the woman made an uninterrupted recovery.

COMMENT

In none of these cases had a caesarean section been performed previously, nor had there been any interference in the present labour so far as is known. All the cases occurred in multiparae, and it is suggested that the cause of the obstructed labour in each case was progressive enlargement of children with each pregnancy. It is felt that a lesson to be learnt is that a good previous obstetrical history should not be allowed to warp one's judgment into expecting that all will necessarily be well with subsequent labours, even with a child in a good obstetric position.

My thanks are due to Dr. R. M. Morris, the Secretary for Health, for permission to publish this article.

H. J. KNIGHT, M.B., B.S., D.Obst.R.C.O.G.,
Medical Superintendent, Government Hospital, Gatooma,
Southern Rhodesia.