Method and Results

A gruel fractional test meal examination was made and the presence of hyperacidity demonstrated. Forty-eight

FIG. 1.—Superimposed fractional test meal curves of five patients with peptic ulcer.

FIG. 2.—Fractional test meal of same five patients as in Fig. 1 after ingestion of 0.8 g. of resin at point indicated.

hours later a similar examination was performed, but after the third specimen had been withdrawn two tablets (0.8 g.) of resin were given. The subjects were asked to chew the tablets to a fine powder, and then swallow them. The curves of free and total acid (average of the five patients) are shown (Fig. 1). The second graph (Fig. 2) is of the same five, except that polyaminostyrene has been given at the point indicated. It can be seen that the free acid is eliminated and the total acid greatly reduced. This effect has been observed to last for an average of two hours after the tablets are taken. No unpleasant side-effects were observed; and it is perhaps significant that, of the five patients, three considered that their ulcer pain was relieved within ten minutes of taking the resin.

Discussion

Since this was merely a pilot investigation to determine whether in fact a prolonged clinical trial would be worth while, no attempt was made to observe the effect of the resin upon healing of the ulcer, etc. Blood electrolyte studies were not made, in view of the very small dosage given, but in a larger series, when the resin would be given over a prolonged period of time, this would become necessary. However, the effects of anionic exchange resins as antacids have been studied by Segal *et al.* (1945) and by Wirts *et al.* (1950). The results obtained show that the resins have an action similar to that of aluminium hydroxide. Both substances will cause a rise in the pH of the gastric contents, reducing the free acid and depressing pepsin activity. Anionic resins in these cases did not cause electrolyte imbalance. Hjort (1953) comments on the double action of polyaminostyrene in reducing peptic activity. This worker demonstrated that not only was pepsin inactivated by the rise in gastric pH, but that the resin was capable of absorbing pepsin and removing it from the stomach. Despite favourable reports from Scandinavia and the U.S.A., there has been a relative neglect of anionic resins in this country, and, as Jordan (1951) states, these substances would seem to merit a trial. Since the sheet anchor of ulcer therapy is still antacids, any simple and safe method of producing neutralization of gastric acidity would be advantageous.

It is difficult for ambulant patients to carry bottles of medicine about with them, and it is important that such patients should have easy access to their drugs throughout

the day. For this reason, medication in tablet form is the vogue, and there are many preparations of this nature available. Of these, perhaps the most reliable is "nulacin" (Douthwaite and Batty Shaw, 1952). This tablet, while sucked in the mouth, provides an alkaline milk drip for the active patient, and has been shown capable of neutralizing gastric hyperacidity. Nevertheless, the tablets are too large for some, and if taken too often may cause alkalosis. Polyaminostyrene, however, has also been shown to be effective, safe, and free from side-effects. Apart from its effect on the pH, the ability of the resin to absorb pepsin makes it attractive to the clinician, and results elsewhere, as stated, have been favourable. Thus Tomenius (1955) sums up by saying that the resin "... of our antacids is one of the best, possibly the best so far available, in the treatment of peptic ulcers." Because of these results, and in the light of personal experience, it is hoped to make a trial of polyaminostyrene in the long-term treatment of peptic ulcer on a much larger group of patients. It is hoped that these findings will be published at a later date.

I would like to thank Dr. J. C. Hawksley, on whose patients these investigations were made.

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Medical Memorandum

Association of Jejunal Diverticulosis with Macrocytic Anaemia

The association of macrocytic anaemia and jejunal diverticulosis has seldom been recorded. The first case we have been able to trace is that of Taylor (1930). Other cases have been recorded by Montuschi (1949), Badenoch and Bedford (1954), Paulley (1954), and Dick (1955). This last is very similar to our own, and Dick noted the beneficial effect of chlortetracycline (aureomycin) on the intestinal symptoms. Liver preparations had been given previously, and it is not possible to judge what part, if any, the chlortetracycline played in the haematological control. It is therefore worth while reporting a case in which a satisfactory response was obtained with chlortetracycline alone.

CASE REPORT

A married woman aged 70 was referred to the out-patient department in May, 1954, with abdominal pain; she had suffered from such attacks for 40 years and had had her appendix removed in 1926. After an attack of bronchitis in December, 1953, her health declined, with repeated attacks of abdominal pain and vomiting, and loss in weight. She had never had diarrhoea. For the past two or three years her tongue had periodically been sore. She was not regarded as anaemic. Barium-meal examination showed a large diverticulum at the duodeno-jejunal flexure and many fluid levels in the bowel. At operation the large diverticulum was found to be fixed to the inferior mesenteric vein, and as it was thought to be capable of obstructing the bowel (rather in the manner in which a pharyngeal pouch produces dysphagia) it was removed. Beyond this there were 80 or more fair-sized jejunal diverticula (Fig. 1).

After her discharge she suffered from diarrhoea as well as from periodic abdominal colic and vomiting. Her stools

were loose and "like a baby's." She noticed that fat upset her. In November, 1954, she felt paraesthesiae in the fingers and was readmitted because of anaemia.

On examination she was a thin, pale woman with some faint skin pigmentation of the trunk. The tongue and nails were normal. The abdomen was moderately distended and peristalsis was visible. No lesion in the nervous system was discovered.

On November 18 a blood count showed: Hb, 5.9 g./100 ml.; P.C.V., 20%; M.C.H.C., 30%; R.B.C., 1,360,000;

FIG. 1.—Photograph showing numerous jejunal diverticula.

M.C.V., 143 cubic microns; W.B.C., 2,500 (polymorphs 46%). The red cells were macrocytic hypochromic, and showed gross anisocytosis and poikilocytosis. The sternal marrow was hypercellular. The myeloid-erythroid ratio was 1:2.5. Megaloblasts constituted 29.8% of the marrow cells and were very like those characteristic of pernicious anaemia in relapse. Reticulocytes between November 22 and 29 were less than 1%. Serum bilirubin, less than 0.5 mg. per 100 ml.;

fat balance: intake 50 g. of fat daily, 86.6% absorption (unfortunately, owing to error in collection, the balance was limited to two days).

On November 30 chlortetracycline, 250 mg. six-hourly, was started, being continued until December 13. During this time her abdomen became less distended and the diarrhoea diminished.

On December 12 she developed fever and an exacerbation of the diarrhoea, and it was felt unwise to persist with chlortetracycline. Owing to an error, cyanocobalamin, 100 µg. daily, was given by mouth from December 11 to 17 inclusive. Fig. 2 shows the maximum reticulocyte response of 11.8% on the eighth day of chlortetracycline therapy (and Hb 9.5 g./100 ml., and R.B.C. 3,280,000 on December 14). A second reticulocyte response of 7% followed the intramuscular cyanocobalamin (500 µg. on December 15 and 100 µg. on the 16th).

By January 7, 1955, with no further treatment than a low-fat diet, the blood count was: Hb, 12 g./100 ml.;

FIG. 2.—Chart showing response to chlortetracycline.

P.C.V., 36%; M.C.H.C., 33%; R.B.C., 3,920,000; M.C.V., 91 cubic microns; W.B.C., 6,350.

On December 31 a fasting test meal showed a histamine-fast achlorhydria; the serum calcium was 9.6 mg. per 100 ml. and serum inorganic phosphorus 4.6 mg. per 100 ml.

The patient was discharged on January 11. When last seen (May 12) her Hb was 14.2 g./100 ml.; the red cells were normochromic and normocytic. She felt better than for over a year, and the diarrhoea had ceased and she needed mild laxatives to prevent constipation.

COMMENT

The presence of a histamine-fast achlorhydria suggests the possibility that this was merely a case of pernicious anaemia with jejunal diverticulosis. However, the presence of an intestinal disorder, the development of severe anaemia following the onset of diarrhoea, and the normal serum bilirubin are in favour of an anaemia of intestinal origin.

There is a body of evidence, reviewed by Barker and Hummel (1939) and by Watson (1950), to suggest that these anaemias are due to infection of the small bowel, and it was with this possibility in mind that chlortetracycline was used in our case. It has been used in the treatment of pernicious anaemia (Lichtman *et al.*, 1950; Davis and Brown, 1953), nutritional megaloblastic anaemia (Davis and Brown, 1953), and intestinal macrocytic anaemia due to a blind loop (Naish and Capper, 1953), with significant but suboptimal haematological response. The more satisfactory response in our case than in those referred to above may have been due to a difference in dosage. We used a smaller daily dose than Lichtman or Naish and Capper. Foy *et al.* (1952) have shown that the dose of penicillin used in treating megaloblastic anaemias in Africans is important, and believe that too large a dose may destroy organisms synthesizing essential substances as well as competing flora.

Little is known about the flora of the intestine in cases of intestinal anaemia, and it is recommended that when such patients come to operation needling or swabbing of the small bowel should be carried out for bacteriological purposes.

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A home for children whose home life is interrupted by the treatment of their mother's tuberculosis was opened recently by the Duchess of Kent. The home, which is named the Edith Edwards Children's Home after its benefactress, will be administered by the Invalid Children's Aid Association. The association was appointed trustee of the Edith Edwards Trust, amounting to £29,000, under a scheme drawn up by the Charity Commissioners. The home will accommodate 30 children and allow brothers and sisters to stay together. Inquiries about the home should be sent to the General Secretary, Invalid Children's Aid Association, 4, Palace Gate, London, W.8.