The British Society of Gastroenterology

The 24th annual meeting was held at Brighton on 1 and 2 November 1963 with Dr. W. A. Bourne as President and Dr. J. K. Wagstaff as local secretary. The meeting was held at the Grand Hotel, Brighton, and at the University of Sussex. A most delightful dinner was held at the Royal Pavilion.

At the annual business meeting the following were elected: President-Elect, C. E. Newman; Hon. Treasurer, G. D. Hadley; Hon. Secretary, H. A. Magnus; Council members, R. H. Girdwood and F. H. Kemp. The following were elected to the ordinary membership: E. D. Acheson, E. V. Cox, C. W. Crane, G. P. Crean, I. E. Gillespie, I. D. Johnston, A. G. Melrose, A. N. Smith and J. K. Wagstaff. The following were elected to the Associate Membership: J. H. Baron, P. A. J. Ball, C. G. Clark, F. C. Edwards, D. A. P. Evans, P. B. Gatnby, M. J. S. Langman, M. S. Losowsky, K. Lumsden, C. F. McCarthy, I. P. M. MacDougall, N. S. Painter, R. C. Reynell, A. D. Roy, R. Shields, J. Schrager, J. S. Stewart, R. Wright, R. B. Wright, W. B. Young.

At the scientific meeting papers were presented of which the following are summaries.

GASTROINTESTINAL 'HORMONES'

E. L. Blair, A. A. Harper, H. J. Lake, and J. D. Reed (Newcastle) 'Gastrin' extracts of pyloric gland area and intestinal mucosa exhibit a variety of stimulatory activities in the gastrointestinal tract. These various activities could be the properties of one complex molecule or of several closely associated molecules.

In support of one complex molecule is the difficulty found in separating the various stimulatory activities of these extracts using the accepted technique of protein chemistry and the frequency with which in disease states alterations in the concentrations of acid stimulant in pyloric gland area extracts are accompanied by parallel alterations in the concentrations of pepsin and pancreatic enzyme stimulants.

The polymolecular view is supported by the extraction from the intestinal mucosa of some of these stimulants separately; by an occasional dissociation between the proportions of the various stimulants in extracts of pyloric gland area mucosa and tumour tissue; by the absence of cholecystokinin from potent gastrin extracts of pyloric gland area mucosa, and by the preparation of such extracts which contain no significant pepsin stimulant.

PEPSIN RESPONSES TO HISTAMINE AND TO GASTRIN EXTRACTS

I. E. Gillespie (Sheffield) Whether the increased gastric pepsin output following histamine administration is due to true stimulation, or simply to 'wash-out' by the acid response is still a subject of debate. A major obstacle to the interpretation of pepsin responses to histamine has been the inability to measure basal pepsin outputs, the volumes being often so small, and the pH frequently sufficiently high to inactivate any pepsin present. In a Heidenhain pouch both of these problems can be overcome by using the technique of Schofield, in which a measured volume of acid is introduced at the beginning of each collection period. From experiments using this technique evidence will be presented that histamine truly stimulates an increased pepsin production, the effect decreasing with increase in dosage. The pepsin response pattern obtained using gastrin extracts was triphasic. Hypotheses regarding the intimate mechanism of pepsin stimulation were discussed in the light of these response patterns.

INTRAGASTRIC TITRATION USING A pH TELEMETERING CAPSULE

A. M. Connell and T. E. Waters (London) The limits of accuracy of the Heidelberg pH telemetering capsule were assessed. This capsule has been shown to be accurate to ±0.5 pH unit in the first three hours after activation. Using this capsule direct measurements of the rate of secretion of hydrochloric acid by the stomach were made, adopting the method of intragastric titration to measure both basal and maximal acid secretion. The method has been compared directly with the augmented histamine test and the estimates of acid secretion by the two methods correlated well.

It was concluded that telemetering capsules in association with the method of intragastric titration provides a simple, comfortable, and accurate method of estimating gastric secretion.

CHROMATOGRAPHIC STUDIES OF HYDROLYSATES OF HUMAN GASTRIC SECRETION AND SALIVA

J. Schrager (Wigan) Human gastric secretion and saliva were dialysed at 4°C, for five days until chloride free (the gastric secretion was incubated with diastase at 37°C, for five hours before dialysis). The dialysed secretions were hydrolysed and the liberated sugar components resolved chromatographically. Ninety hydrolysates of gastric secretion and 50 salivas were investigated. They all showed the presence of galactose, fucose, mannose, and glucose. No uronic acid could be detected. When uronic acid was added to the gastric secretion and hydrolysed it did appear in the chromatograms. One per cent solution of chondroitin sulphate treated exactly
as the gastric secretion and chromatogrammed showed uronic acid. The carbohydrate components of the gastric mucopolysaccharides of patients with gastric carcinoma showed quantitative ratio differences from those of all the gastric secretions investigated. In the latter galactose and fucose are the predominant sugars. The secretion of the malignant stomach revealed a marked decrease in galactose and a great increase in glucose.

THE EFFECT OF OESTROGENS AND PROGESTOGENS ON GASTRIC SECRETION IN PATIENTS WITH DUODENAL ULCER

S. P. PARSHOO and I. D. A. JOHNSTON (Belfast) Renewed interest in the relationship between ovarian hormones and gastric secretion has arisen following Truelove's report of the value of oestrogens and progestogens on the output of acid, pepsin, and mucus in 29 patients with clinical and radiological evidence of duodenal ulcer.

Stillboestrol and norethisterone were given orally in doses of 10 mg. per day for one month and the basal and augmented histamine secretion measured before and after. There was no significant change in the output of gastric acid or pepsin. There was an increase in the amount of visible mucus secreted in patients treated with stilboestrol and norethisterone. The nitrogen content of the basal secretions was increased after stilboestrol. There was a significant remission of symptoms in the patients receiving oestrogens.

The effect of an intramuscular progestogen (17α-hydroxyprogesterone caproate) was studied in five men without any effect on acid or pepsin production after 10 days.

The effect of intravenous infusions of large doses of oestrogens was studied in patients secreting steadily at low rates in response to continuous intravenous histamine. Six subjects received conjugated equine oestrogens and three oestriol di-hemisuccinate, a synthetic 'non-oestrogenic' oestrogen. No significant change in acid output occurred.

The possible modes of action of oestrogens in providing relief of ulcer symptoms were discussed.

FOLIC ACID DEFICIENCY FOLLOWING GASTRECTOMY

A. E. READ, K. R. GOUGH, and J. L. THIRKETTLE (Bristol) Folic acid and vitamin B₁₂ metabolism was studied in patients before and after gastrectomy. In a small group of patients after gastrectomy folic acid deficiency was severe enough to cause megaloblastic anaemia. In a larger group of post-gastrectomy patients there was biochemical evidence of folic acid deficiency. The reasons for these observations were discussed with particular reference to the nutritional status of patients before and after operation.

POST-GASTRECTOMY BONE DISEASE

J. A. WILLIAMS, G. I. NICHOLSON, and W. T. COOKE (Birmingham) The physiological changes that follow gastric operations may lead to many disorders of metabolism including those of fat, fat-soluble vitamins, proteins, and calcium. Gross bone disease is rarely reported after gastrectomy and is usually diagnosed as osteomalacia due to associated steatorrhoea. Forty-two post-gastrectomy patients with evidence of disturbed bone metabolism were studied biochemically, radiologically, and by bone biopsy. Some patients had osteomalacia and some osteoporosis though most showed features of both diseases. One patient had osteomalacia, hyperparathyroidism, and a parathyroid adenoma.

The exact categorization of this common bone disease is so difficult that it has been considered as a separate entity and for the present it has been termed 'post-gastrectomy bone disease'.

THE ABSORPTION OF MONOSACCHARIDES IN MAN

C. D. HOLDsworth and A. M. DAWSON (London) The absorption of monosaccharides in the jejunum of man has been studied by a modification of the technique described by Schedl and Clifton (1961). At a constant infusion rate of 20 ml. per minute, the kinetics of absorption of glucose and galactose were similar, and by means of a Lineweaver-Bark plot the data were consistent with Michaelis-Menten kinetics, absorption rising to a maximum of 0.4 g. per 30 cm./minute. The absorption rate of fructose was directly proportional to the concentration perfused. Glucose inhibited the absorption of galactose but not of fructose.

In idiopathic steatorrhoea a Vmax for glucose could still be demonstrated, but was much lower at 0.1 g. per 30 cm./min., while fructose absorption was again proportional to the concentration perfused. After treatment with a gluten-free diet the Vmax for glucose became normal in two patients, but remained low in two other patients in spite of return of xylose absorption to normal as assessed by the standard urine excretion technique.

These results suggest that, as found by techniques in vitro using animal mucosa, glucose and galactose in man are absorbed by a special transport system which is shared at some point, whereas fructose is absorbed by a different mechanism. In idiopathic steatorrhoea a transport system for glucose capable of saturation can still be demonstrated in spite of the mucosal cells being histologically abnormal.

REFERENCE


IRON ABSORPTION IN 'FAMILIAL HAEMOCHROMATOSIS MEASURED BY A DOUBLE ISOTOPE TECHNIQUE

ROGER WILLIAMS, C. S. PITCHER, and H. S. WILLIAMS (London) Iron absorption has been measured using a double isotope technique. Fe⁵⁷ is injected intravenously in the form of labelled plasma and Fe⁵⁵ is given orally as a solution of a ferric salt during the course of a standard meal. The percentage absorbed is determined from the activities of the two isotopes in the red cells at 14 days and the method is ideal for out-patient investigation. The mean absorption in 30 normal subjects was 7.5% and the upper limit of the normal range 18%.
In primary idiopathic haemochromatosis only one of the three patients examined before venesection therapy had increased absorption. Iron absorption, however, was markedly increased in six other patients studied during venesection therapy and in five of seven patients seen a year after treatment had been completed. Twelve immediate relatives were also examined. In six absorption was increased and in three others the percentage absorbed was at the upper limit of normal.

Although the increased absorption of iron demonstrated in the relatives would be sufficient to account for the gradual appearance of the disease, it seems likely that environmental factors also influence its development. Approximately a third of patients with well-compensated alcoholic or cryptogenic cirrhosis were found to have increased iron absorption.

THE ROLE OF THE ADRENAL CORTEX IN THE CONTROL OF WATER AND ELECTROLYTE TRANSFER ACROSS THE INTESTINAL MUCOSA

R. SHIELDS (Cardiff) In 90 minutes a volume of fluid equal to the plasma volume, enters and leaves the lumen of the intestine by virtue of the simultaneous exchange of water and electrolytes across the intestinal mucosa. The factors controlling this two-way transfer of fluid are poorly understood. The adrenocortical control of the intestinal transport of water, sodium, and potassium was investigated in isolated segments of ileum and colon of dogs. In states of sodium depletion, both sodium and water were conserved by a reduction in the rate at which these substances were excreted into the gut. Potassium entered the gut at a markedly increased rate. The intestinal loss of potassium was also increased after the intravenous administration of aldosterone whose intestinal action could be blocked by spironolactone.

This work shows that water and electrolyte transport in the intestine can be influenced by adrenocortical steroids and suggests that these hormones may act on the gut in a manner fundamentally similar to the way in which they act on the renal tubules, that is to promote sodium conservation by the body, and at the same time, favour potassium loss.

ABSORPTION OF WATER AND ELECTROLYTES FROM THE ILEUM WITH SPECIAL REFERENCE TO THE EFFECT OF REGIONAL ENTERITIS

H. L. DUTHIE and J. D. ATWELL (Leeds) Using radioisotopic techniques, the bidirectional rates of transport of water, sodium, and potassium were measured in isolated loops of ileum in 10 patients undergoing radical surgery.

Regional enteritis of mild degree tended to make the loops of ileum lose water and electrolytes into the lumen. This loss was mainly due to an increase in the movement from the body into the intestinal lumen (exsorption) and to a lesser extent due to a diminution of the movement from the intestinal lumen into the body (insorption). More severe disease, with involvement of all coats of the bowel wall, was associated with an obvious decrease in both insorption and exsorption. The resultant net movement was minimal. The possible functional implications of these findings were discussed.

MUCOSAL STRUCTURE AND ABSORPTIVE FUNCTION OF JEJUNUM AND ILEUM IN IDIOPATHIC STEATORRHOEA

J. S. STEWART, D. J. POLLOCK, C. C. BOOTH, and D. L. MOLLIN (London) Mucosal biopsies were taken from the jejunum and ileum of nine patients with idiopathic steatorrhea. These studies confirmed that the proximal intestine is involved in this condition, the ileum being either normal or less severely involved than the jejunum.

To determine the effects of these changes on intestinal function, studies of absorption of xylose, folic acid, pyridoxine, and ascorbic acid (substances predominantly absorbed proximally) were carried out; fat balances were also performed and vitamin B₁₂ absorption (a test of distal bowel function) was studied. Patients with convoluted jejunal mucosa and normal ileum showed moderate impairment of folic acid absorption and minimal or no steatorrhea; all but one of those with a flat jejunum showed more severe steatorrhea and malabsorption of folic acid. On the other hand, pyridoxine absorption was often normal and ascorbic acid was invariably normally absorbed. There was no clear correlation between ileal structure and the absorption of vitamin B₁₂.

THE BACTERIOLOGY OF THE SMALL INTESTINE IN MALABSORPTIVE STATES

A. W. DELLIPIANI and R. H. GIRDWOOD (Edinburgh) The bacteriology of the gastrointestinal tract was studied by an intubation technique using a fine polyvinyl tube.

The patients studied included patients with ‘primary malabsorptive disease’ and patients with impaired absorption related to anatomical derangement of the small intestine due to jejunal diverticulosis, ileo-transverse colostomy, partial gastrectomy, and gastro-enterostomy.

In patients with malabsorptive disease the small intestinal flora did not differ consistently from that in a control group of patients, though yeasts and lactobacilli did appear to be more common.

In patients with blind or stagnant loops in the small intestine the finding of an abnormal flora was not infrequent. An abnormal content of coliiform organisms was present in the upper small intestine when there was impairment of vitamin B₁₂ absorption resulting from the presence of a blind or stagnant loop regardless of the site of the loop in the small intestine.

THE NATURE OF THE TOXIC SUBSTANCES PRODUCED BY LATE STRANGULATION OBSTRUCTION OF THE BOWEL

J. M. POWLEY and A. C. B. DEAN (London) Figures were produced showing that a high mortality from intestinal obstruction persists in spite of modern improvements in resuscitating. Circulation failure often results from absorption of the fluid produced by strangulated bowel,
but the identity of the toxic factor is still disputed and its mode of action has not been clearly demonstrated.

Fluid was prepared in dogs using pure cultures of a variety of bacteria in an isolated strangulated loop of small bowel. A product of coliform organisms is responsible for toxicity, probably the endotoxin typical of all Gram-negative bacteria. Other bacteria tested, including *Clostridia*, are not important, and by-products of bowel necrosis do not appear to be toxic. Potency was assessed by mouse toxicity and falls in blood pressure were reproduced in anaesthetized cats. Other studies were made on smooth muscle preparations including human vein. Toxic fluid enhances the effect of adrenaline, a finding which is known to be another characteristic of endotoxins.

It is suggested that sympathtic should not be used in the treatment of circulatory failure in late strangulation obstruction and that anti-adrenaline substances such as chlorpromazine may be more effective.

THE EPIDEMIOLOGY OF ULCERATIVE COLITIS AND REGIONAL ENTERITIS IN OXFORDSHIRE

E. D. ACHEON and J. GRIMLEY EVANS (Oxford) A survey for the years 1951-1960 was made of all cases of regional enteritis, ulcerative colitis, and proctitis in a population of 300,000 in and around Oxford. It was found that colitis and proctitis were eight times as common as regional enteritis. The frequency of colitis and proctitis had increased over the decade and although this was partly due to increased discovery of the diseases, there was also, probably, a real increase in attack rate. Age- and sex-specific rates for these two conditions were plotted, and showed a slight female preponderance. The rates were low in childhood, reached a peak in early adult life, and thereafter declined, although the risk continued into old age. A secondary rise in the rate was found for the sixth and seventh decades, but the significance of this is not yet clear.

No geographical variations in incidence were found within the region, and marital status, urban or rural residence, and degree of crowding were without demonstrable effect on the risk. A slight social gradient was found, classes 4 and 5 being affected less than classes 2 and 3. The risk in Jews appeared to be higher than in the general population.

EXTRAHEPATIC PORTAL HYPERTENSION: STUDIES ON THE AETIOLOGY AND CHANGES IN LIVER FUNCTION

EILEEN N. THOMPSON, ROGER WILLIAMS, and SHEILA SHERLOCK (London) Possible aetiological factors were examined in a group of 46 non-cirrhotic patients with extrahepatic portal vein thrombosis proven by splenic venography or at laparotomy.

Forty-eight per cent of the 23 children in the group had a history of sepsis, seven of whom had neonatal sepsis, compared with a history of sepsis in 21% of the adult patients. Two children had had exchange transfusions. In the adult patients pancreatic tumours, myeloproliferative disorders, and pregnancy were the predominant aetiological factors. In 20 patients the aetiology was unknown. A follow-up survey of 438 children who had had exchange transfusions and 80 cases of neonatal sepsis failed to reveal any further cases of portal hypertension, showing that the incidence of this syndrome occurring after an exchange transfusion is rare.

In the older age group there was definite clinical and biochemical evidence of liver cell dysfunction in the patients who had been followed for five to seven years. Increased bromsulphalein retention was found in 18% of 20 adult patients. All nine children examined had normal bromsulphalein excretion. Measurement of the relative storage capacity and secretory transport maximum for bromsulphalein showed that the increased retention in adult patients was due to a marked reduction in storage capacity.

CHRONIC PANCREATIC EXOCRINE DISEASE IN UGANDA

J. G. BANWELL, JEAN CAMPBELL, V. BLACKMAN, and M. S. R. HUTT (Kampala, Uganda) Tropical and non-tropical sprue are uncommon in Africa but no accurate information is available as to the prevalence of other causes of the malabsorption syndrome. Reports from Indonesia, Uganda, and Nigeria have described pancreatic calcification in association with diabetes mellitus with varying emphasis on the prevalence of steatorrhoea.

In a study made over a two-year period in Kampala we found that chronic pancreatic disease was the cause of over 90% of all cases of the malabsorption syndrome. Intestinal tuberculosis and effects of surgical treatment (post-gastrectomy steatorrhoea, massive resections of small bowel for strangulated hernias or volvulus) accounted for the remainder. Hookworm infestation, although prevalent in this community, in our experience has not produced the malabsorption syndrome.

Pancreatic exocrine deficiency was assessed in our series both by such standard clinical methods as serum amylase estimations, secretin pancreatic tests, provocative serum amylase tests, starch tolerance tests, and radiology of the upper abdomen for evidence of calcification. Small intestinal function was studied by 72-hour stool fat estimation, vitamin A absorption tests, d-xylene excretion tests, jejunal biopsy, and radiological studies of the small bowel using a barium follow-through or enema technique. Patients with pancreatic exocrine deficiency frequently had steatorrhoea and/or diabetes mellitus. There were distinct differences between our patients and the disease of chronic pancreatitis as seen in North America and Europe.

Features of tropical pancreatic disease Many Ugandan patients were young, presenting in adolescence or early adult life with symptoms of diabetes mellitus and malnutrition. Diabetic ketosis was rarely seen.

Chronic alcoholic ingestion was a feature of some patients. It could not be related to the disease of early adult life.

Cholecytitis and cholelithiasis were not present in our series.

The presence of significant malabsorption was associated with clinical features of extreme wasting, parotid gland enlargement, and changes in the hair, skin, and
mucous membranes which resembled adult kwashiorkor.

Significant abnormalities were found in the jejunal mucosa in pancreaticoatrogenic diabetes. The more grossly abnormal mucosal changes were related to impaired d-xylene excretion.

131I albumin turnover studies failed to demonstrate abnormal protein loss into the intestinal lumen.

Liver function tests and liver biopsy material failed to demonstrate any significant hepatic abnormality apart from excess iron in the liver cells in some cases.

THE RESULTS OF SURGICAL REPAIR OF HIATUS HERNIA

D. A. W. EDWARDS, J. W. P. GUMMER, S. F. PHILLIPS, and E. N. ROWLANDS (London) The symptomatic and radiological results of repair operations for hiatus hernia performed between 1951 and 1963 were examined in 63 patients. In spite of a high incidence (about 60%) of post-operative radiological evidence of some degree of reflux the symptoms of the corrosive action of gastric juice were usefully reduced in severity in 90%. Vagotomy and drainage, or gastric resection, did not influence the symptomatic result but contributed an additional source for morbidity. Simple repair is very likely to relieve symptoms of corrosion and regurgitation but less likely to relieve vomiting, excessive belching, or dysphagia. About 7% of patients with hiatus hernia were operated upon and at least 50 patients felt the operation was worthwhile. Dissatisfaction arose because of complications or failure to relieve certain symptoms.