FIG. 1—Case 1. Response of hypocalcaemia in neonatal rickets to calcium supplements and vitamin D. FIG. 2—Case 2. Right lower femoral epiphysis two weeks after delivery showing splaying and irregularity typical of rickets.

serum alkaline phosphatase was 32 K.A. units/100 ml. These figures were strongly suggestive of neonatal rickets and maternal osteomalacia respectively. X-ray films of the infant's long bones showed evidence of active rickets, most noticeable at the lower femoral epiphyses (fig. 2). Examination of the urine showed generalized amino-aciduria. The infant was treated with 1,000 I.U. of calciferol daily and showed complete clinical, biochemical, and radiological remission within three months.

Comment

The neonatal rickets found in these two cases was almost certainly acquired in utero, and the terms "congenital" or "fetal" rickets could be applied with equal justification. A substantial number of Asian women with osteomalacia now live in the United Kingdom, and many are of child-bearing age. This has provided a setting in which cases of neonatal rickets may appear for the first time in appreciable numbers. As shown initially in case 1, the condition may be easily overlooked or misdiagnosed. Rickets should always be considered as a cause of tetany or convulsions in neonates born to Asian mothers. Softening of the skull bones should be looked for routinely at the infant's postnatal examination. Radiological evidence of the disease or the characteristic biochemical changes, in particular a raised level of serum alkaline phosphatase, should confirm the diagnosis and differentiate it from other causes of neonatal hypocalcaemia. Amino-aciduria, a sensitive index of early vitamin D deficiency (Chisolm and Harrison, 1962), may provide additional supporting evidence.

The prevention of neonatal or congenital rickets depends on the detection and adequate treatment of osteomalacia during pregnancy. Osteomalacia is sufficiently common in the Asian population of the United Kingdom to merit biochemical screening for this disease as a part of routine antenatal care. A survey of the prevalence of neonatal rickets and hypocalcaemia in infants born to Asian mothers would be of wide interest.

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Mucosal Ulceration and Mesenteric Lymphadenopathy in Coeliac Disease

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Ulceration of the small bowel mucosa has been reported in a number of cases of coeliac disease and is probably a direct complication of the disease itself. The prognosis is poor and it has been suggested that surgical resection gives the best chance of survival, no effective medical therapy being known (Bayless and Hendrix, 1970). The following case shows that healing of the ulcers may occur with intensive conservative management.

Case Report

An Irishman aged 58 was admitted to hospital in May 1971 with upper abdominal distension for four months and weight loss of

1 st (6.4 kg). For a week before admission he had passed pale loose motions, up to eight daily, and had noticed a postprandial "dragging" pain in the left hypochondrium. On examination he was seen to be wasted and dehydrated. The tongue was smooth and there was tenderness in the left hypochondrium.

INVESTIGATIONS AND TREATMENT

Haemoglobin 16.7 g/100 ml; serum folate 1.5 ng/ml; serum B₁₂ 300 pg/ml; serum iron 20 µg/100 ml; total iron binding capacity 165 µg/100 ml. Tests of digestion and absorption: glucose tolerance test 60-70-70-80-70 mg/100 ml after 50 g glucose by mouth; faecal fat excretion 27 g/24 hr; xylose excretion 0.6 g in five hours after 5 g dose (normal > 1.2 g); serum calcium 8.4 mg/100 ml; serum phosphorus 3.5 mg/100 ml; jejunal biopsy showed on dissecting microscopy a flat mosaic appearance and there was subtotal villous atrophy on light microscopy (fig. 1).

FIG. 1—Subtotal villous atrophy of jejunal mucosa on first biopsy. (H. and E. × 19.)

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Liver function: serum bilirubin 0.7 mg/100 ml; alkaline phosphatase 38 K.A. units (electrophoresis 95% liver origin); 5-nucleotidase 45 IU/l. (normal > 17 IU/l); aspartate aminotransferase 80 units/ml (normal < 40 units/ml); alanine aminotransferase 60 units/ml (normal < 35 units/ml); serum albumin 2.3 g/100 ml; serum globulin 3.0 g/100 ml; bromsulphalein retention 40% at 45 min. Immunoglobulin: IgA 740 mg/100 ml (normal 170-410 mg/100 ml); IgM 150 mg/100 ml (normal 50-110 mg/100 ml); IgG 1,000 mg/100 ml (normal 900-1,500 mg/100 ml); C3 100 mg/100 ml (normal 125-170 mg/100 ml). Skeletal survey showed osteoporosis.

Because of the possibility of lymphoma laparotomy was carried out (Mr. J. F. Clegg, 12 July, 1971). Three segments of the distal jejunum showed thickening of the bowel wall, with dilated bowel proximal to these segments. Enlarged, firm lymph nodes were present throughout the small bowel mesentery, which was itself thickened; the mesenteric lymphatics were dilated and fluid spurted from them when cut. Biopsy specimens of the thickened jejunum, the liver, and lymph nodes were taken. Histological examination of the jejunum showed patchy ulceration with plasma cell and polymorphonuclear infiltration and fibrosis extending through the muscularis (fig. 2). No granulomas were seen. The mesenteric lymph nodes and lymphatics were grossly distended with chyle and the architecture of two of the lymph nodes had been replaced by fibrous tissue (fig. 3). Perilobular fatty infiltration was present in the liver.

FIG. 2—Small intestine showing ulceration, inflammation, and fibrosis with destruction of muscularis mucosae. (H. and E. $\times 39$.)

FIG. 3—Mesenteric lymph node showing fibrosis and central cavity (bottom left) which had contained eosinophilic material. (H. and E. $\times 33$.)

Postoperatively the patient was treated with strict gluten withdrawal. After three weeks there was no clinical improvement and prednisolone 60 mg daily was started. A right subclavian vein thrombosis occurred, and after multiple pulmonary emboli had developed anticoagulation with intravenous heparin, followed by oral phenindione, was instituted. Intravenous feeding with Aminosol and Intralipid was begun four weeks after surgery.

Five weeks after the operation there was some clinical improvement and the faecal fat excretion had fallen to 12 g/day. Recovery was set back, however, by the development of a lung abscess, and seven weeks postoperatively subacute intestinal obstruction occurred which eventually required surgical relief.

The jejunum was found to be constricted by a fibrous band at the site of the previous biopsy. In contrast the rest of the small bowel appeared normal; the lymph nodes had diminished in size and the mesenteric thickening was less marked. The constriction was excised and the jejunum biopsied at a site proximal to this. The mucosa of the proximal jejunum showed partial villous atrophy and infiltration by chronic inflammatory cells.

Postoperatively the patient's condition improved and the prednisolone was reduced. Xylose excretion returned to normal levels and the lung abscess diminished in size. He was discharged having gained 20 lb (9 kg) in weight.

On repeat peroral jejunal biopsy (19 October 1971) the improvement in architecture was seen to be maintained; immunofluorescence (Dr. Francis Green) showed the normal predominance of IgA. One year after discharge the patient remained well. Prednisolone was stopped two months after discharge and a further weight gain of 18 lb (8.2 kg) occurred. Serum immunoglobulins returned to normal levels and a further jejunal biopsy (18 April 1972) showed marked improvement, though a degree of partial villous atrophy remained.

Comment

Small bowel ulceration complicating coeliac disease may prevent a response to gluten withdrawal or cause a recurrence of symptoms in a patient maintained on a gluten-free diet. In the present case no other cause of intestinal ulceration can be incriminated; the patient was not receiving corticosteroids, enteric-coated potassium, or salicylates.

The prognosis is usually poor, survival occurring in only five out of 16 previously reported cases. Four of these cases were treated by resection of the ulcerated small bowel followed by gluten withdrawal (Hindle and Creamer, 1965; Davidson, 1969; Moritz *et al.*, 1971) and one was treated and then maintained on corticosteroids alone (Goulson *et al.*, 1965).

The value of resection of the ulcerated small bowel followed by gluten withdrawal seems evident. Corticosteroids have been implicated as a possible cause of intestinal perforation and haemorrhage; nevertheless, they may in the individual case, such as the one reported here, exert a specific beneficial effect.

Abnormalities in the mesenteric lymph nodes were prominent in the present case and had been noted in nine of the 16 previous reports.

The aetiology of intestinal ulceration in coeliac disease is unknown. It is possible that abnormalities in immunoglobulins secreted into the intestinal lumen may allow food antigens to damage the mucosa and cause ulceration.

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