

Case report

Juvenile pernicious anaemia in a Sri Lankan child

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Introduction

Juvenile onset pernicious anaemia has been described in children. The clinical features include the characteristic megaloblastic anaemia, neurological features and development delay (1,2). An autosomal recessive inheritance pattern has been described. The disease is a vitamin B12 (cobalamin) deficiency due to lack of intrinsic factor. We report a case of juvenile pernicious anaemia in a Sri Lankan child.

Case report

A 6-year old boy was admitted to the Professorial Unit, Lady Ridgeway Hospital, Colombo, with difficulty in walking, paraesthesiae in both legs, lethargy, severe anorexia, pallor and pigmentation of extremities. At age 3 years he had undergone a nephrectomy for a non-functioning kidney with grade 5 vesico-ureteric reflux. He had no symptoms referable to the gastrointestinal tract and no history of gastric or intestinal surgery. His schooling had stopped because of the present illness.

He shared the family diet, which included milk and meat, and was the second of three children born to consanguineous parents. The siblings and parents were healthy.

He appeared well thrived (height 108 cm, weight 15.9 kg). He was drowsy and apathetic, with severe pallor, a smooth shiny tongue, peripheral pigmentation, ankle oedema and a blood pressure of 90/60 mm Hg. Muscle power in the lower limbs, was grade 3, and in the upper limbs grade 4. There was generalised hypotonia, absent tendon reflexes and bilateral extensor plantar reflexes. He was ataxic and unable to stand without support. Examination of the sensory system showed absent position sense.

The haemoglobin level was 3.2 g/dl, platelet count $128 \times 10^9/l$, white cell count $5.2 \times 10^9/l$ with 72% lymphocytes, and the reticulocyte count 0.6%. Macrocytes and target cells were seen in the peripheral blood film. Urine analysis was normal and the culture sterile. Blood urea was 2.3 mmol/l, serum creatinine 0.6 mmol/l and creatinine clear-

ance 109 ml/min/1.73m² BSA. Bone marrow examination showed megaloblastic erythropoiesis. The nerve conduction velocities were: right median nerve 36 m/s, right ulnar nerve 42 m/s and right common peroneal nerve 30 m/s. The terminal latencies for these nerves were 3.3, 2.4, and 6.2 m/s respectively. Low amplitude muscle action potentials were recorded.

Serum B12 was undetectable and serum folate was within normal limits. Gastroscopy showed normal mucosa, confirmed histologically. Gastric secretion, had normal amounts of acid. Intrinsic factor activity in gastric secretion and in mucosal biopsy specimens were not assessed. Parietal cell and intrinsic factor antibodies were absent in the serum.

The child was treated with vitamin B12 by intramuscular injections 1 mg daily for 14 days. The serum B12 levels increased to 873 pg/ml. He was followed up with 3-monthly vitamin B12 injections of 1 mg and regular physiotherapy. He made a complete haematological and neurological recovery, and returned to school. His siblings aged 8 and 3 years were asymptomatic and had serum B12 levels of 354 pg/ml and 262 pg/ml (within normal range).

Discussion

Pernicious anaemia is a vitamin B12 (cobalamin) deficiency resulting from a lack of intrinsic factor (IF). In adults it is often due to acquired gastric insufficiency with reduced acid secretion and atrophy of the gastric mucosa. In contrast, in children the gastric acidity and morphology are normal but a lack of IF occurs as an inherited disorder (3). Although rare, several inborn errors of metabolism have been described to result in disease entities similar to pernicious anaemia. The pattern of inheritance in the conditions described so far is autosomal recessive.

These inherited disorders include abnormalities in the absorption, transport or cellular utilisation of vitamin B12. Different clinical presentations enable differentiation

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of these conditions from intrinsic factor deficiency. In the patient we report, a dietary lack of vitamin B12 is unlikely as his diet included food from animal sources (4). There was no evidence of intestinal disease such as neonatal necrotising enterocolitis, inflammatory bowel disease, tuberculosis or surgical resection, to suggest terminal ileal malabsorption. The clinical picture was not of congenital deficiency of transcobalamin II (the principal B12 binding protein in the plasma), which results in severe megaloblastic anaemia in infancy requiring massive doses of vitamin B12 for effective therapy (5).

Several different types of functional IF deficiency have been described including failure of production and the presence of physiologically inactive IF (6). The latter has a reduced affinity to vitamin B12 or to ileal IF receptor. The unavailability of immunohistochemical studies to assess the absence of IF and the Schilling test to differentiate B12 malabsorption and its correction when given with IF, prevented a definitive diagnosis. However, Imerslund-Grasbeck syndrome, a related disorder with a specific vitamin B12 absorption defect was ruled out by the absence of proteinuria (7).

The age of presentation, normal gastric morphology and acidity, the absence of autoantibodies to IF and prompt response to intramuscular B12 suggest a deficiency of IF secretion rather than an inherited disorder of vitamin B12 metabolism as the cause of the clinical features in this patient. This child was recommended life-long intramuscular B12 injections at 3-monthly intervals.

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Moreover, aid which ignores recipients' needs can be useless, or worse. Poor countries are littered with electrical equipment for villages without electricity, machines for which no spare parts can be found, recycled clothes that destroy local textile markets. As long ago as the 1960s, it was apparent that America's PL480 grain programme had virtually destroyed Egypt's wheat farmers. All in all, says one British charity, tied aid is 25% less effective than the untied sort.

Anon (Editorial). *The Economist* 17-23 June 2000, p 20.