Clinical Reports

Immunoglobulin deficiency responding to vitamin B<sub>12</sub> in two elderly patients with megaloblastic anaemia

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Summary: Two elderly patients with vitamin B<sub>12</sub> deficiency were found to have low immunoglobulin levels. These returned to normal on treatment with vitamin B<sub>12</sub>.

Introduction

In younger patients vitamin B<sub>12</sub> deficiency may be associated with immunoglobulin deficiency, but the immunoglobulins do not rise when vitamin B<sub>12</sub> is given (Conn et al., 1968). In older patients with vitamin B<sub>12</sub> deficiency serum immunoglobulins are usually within the normal range (Odgers et al., 1969; Selroos & von Knorring, 1973). This report describes two elderly patients with immunoglobulin deficiency associated with megaloblastic anaemia due to vitamin B<sub>12</sub> deficiency, whose immunoglobulins rose to normal when vitamin B<sub>12</sub> was administered.

Case reports

Case 1

A 79 year old man presented with a 4 year history of weight loss (17 kg) and increasing oedema and lethargy. Investigations showed a macrocytic and megaloblastic anaemia due to vitamin B<sub>12</sub> deficiency. Haemoglobin was 7.2 g/dl, mean corpuscular volume (MCV) was 128 fl, serum vitamin B<sub>12</sub> was 20 ng/l (normal range 160–975 ng/l) and bone marrow examination showed megaloblastic changes. This was caused by malabsorption due to bacterial contamination of jejunal diverticula, as shown on barium studies, a raised serum folate (36.0 μg/l, normal range 6–21) and no absorption of radio-labelled vitamin B<sub>12</sub> without and with intrinsic factor (Chanarin, 1979). A 14C glycocholate breath test was grossly abnormal. Both the vitamin B<sub>12</sub> absorption and the glycocholate breath test improved towards normal after treatment with erythromycin for 2 months.

Before B<sub>12</sub> was given, serum protein levels were low. Total protein was 39 g/l, albumin was 23 g/l; IgG was 5.8 g/l (normal range 5–16 g/l), IgA was 0.75 g/l (1.25–4.25) and IgM was 0.30 g/l (0.5–1.8). Chromium 51 studies showed no evidence of protein-losing enteropathy. After vitamin B<sub>12</sub> therapy, and before erythromycin, IgG had risen to 7.2 g/l, IgA to 4.25 g/l and IgM to 0.95 g/l. Concurrently, haemoglobin rose to 11.4 g/dl with an MCV of 92 fl. Albumin was unchanged and only rose after antibiotic therapy. Therefore the rise in immunoglobulins was related to the vitamin B<sub>12</sub> therapy, and not to alteration of the bowel flora by antibiotics.

Case 2

An 81 year old woman presented with a 6 week history of vomiting and diarrhoea. Investigations showed a macrocytic and megaloblastic anaemia due to vitamin B<sub>12</sub> deficiency. Haemoglobin was 6.0 g/dl, MCV was 108 fl, serum vitamin B<sub>12</sub> was 60 ng/l, serum folate was 19.0 μg/l. Examination of the bone marrow showed megaloblastic changes. This was caused by intrinsic factor deficiency shown by very little absorption of radio-labelled B<sub>12</sub> alone, but normal absorption of vitamin B<sub>12</sub> when given with intrinsic factor (Chanarin, 1979). There was no clinical or biochemical evidence of any other form of malabsorption. Before vitamin B<sub>12</sub> administration, total protein was 47 g/l, albumin was 34 g/l, IgG was 4.0 g/l, IgA was 0.6 g/l and IgM was less than 0.25 g/l. Serum transferrin was within the normal range. After vitamin B<sub>12</sub> administration, albumin was unchanged, IgG rose to 7.7 g/l, IgA to 1.0 g/l and IgM to 0.65 g/l. Concurrently, haemoglobin rose to 11.4 g/dl with an MCV of 69 fl.

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Accepted: 1 July 1985

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Discussion

The hypogammaglobulinaemia in these patients was mild and was of no obvious clinical significance. Low immunoglobulins in a patient with vitamin B$_{12}$ deficiency, rising after vitamin B$_{12}$ therapy, have only been described once before in an infant with congenital transcobalamin II deficiency (Hitzig & Kenny, 1975). The first patient may have had such a deficiency in view of the abnormality of liver synthesized proteins suggested by the low serum albumin. However, the second patient had a relatively normal serum albumin and also a normal transferrin level suggesting no disturbance in liver protein synthesis. Furthermore, an adult case of transcobalamin II deficiency had normal gammaglobulins (Lawrence, 1966).

Vitamin B$_{12}$ does seem to be necessary for immunoglobulin synthesis by lymphocytes (Hitzig & Kenny, 1975). This is not surprising in view of the importance of vitamin B$_{12}$ to metabolic events within the cell. However, low immunoglobulin levels are rare in such patients, so in these patients the lymphocytes may have been unusually sensitive to vitamin B$_{12}$ deficiency.

Acknowledgements

I thank Dr H.J.F. Hodgson and Professor H.M. Hodkinson for helpful discussions and permission to report their patients.

References

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doi: 10.1136/pgmj.61.722.1065

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