THE ABSORPTION OF VITAMIN B₁₂ IN MEGALOBlastic ANAEMIA ASSOCIATED WITH PREGNANCY

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The absorption of ⁵⁷CoB₁₂ has been studied in a group of patients suffering from megaloblastic anaemia associated with pregnancy and in a control group.

The mean urinary excretion of ⁵⁷CoB₁₂ in the patients with megaloblastic anaemia is not significantly different from that of the control group. Five of the 30 patients showed a value towards the lower limit of normal, but the serum vitamin B₁₂ content in this group was within the normal range.

Malabsorption of vitamin B₁₂ does not appear to play a significant role in the pathogenesis of this form of megaloblastic anaemia.

The role of deficient intake, impaired absorption, and loss of anti-megaloblastic factors in the pathogenesis of megaloblastic anaemias associated with pregnancy is obscure. Recent investigations have drawn attention to absorption defects in this group. Chanarin, Anderson, and Mollin (1958) have presented evidence suggesting some impairment in the absorption of folic acid in normal or apparently normal pregnancy, and Baker (1958) finds that the common cause of megaloblastic anaemia in pregnancy in India is a vitamin B₁₂ deficiency due primarily to the presence of an intestinal lesion which impairs B₁₂ absorption.

In Bantu adults in South Africa megaloblastic anaemia is encountered most frequently following pregnancy (Cassel and Metz, 1958). The condition appears to differ from the megaloblastic anaemias of pregnancy in white races, in that it often presents some months after confinement. While 64% of cases occur within three months after delivery, 20% of the patients present with anaemia more than six months after confinement (Metz, 1958). The present study was undertaken to determine the role, if any, of malabsorption of vitamin B₁₂ in this group.

Material and Methods

The subjects investigated were Bantu hospital patients. All had been delivered within the previous year, and were still lactating. Two groups were studied.

Controls.—These were 20 non-anaemic subjects who were convalescing from various diseases, e.g.,

pneumonia, not usually affecting absorption from the gastrointestinal tract. The relation to pregnancy is shown in Table I.

TABLE I
MONTH AFTER CONFINEMENT AND RESULTS OF SCHEDULED TEST IN CONTROLS AND PATIENTS WITH MEGALOBlastic ANAEMIA

Controls			Megaloblastic Anaemias		
No.	Month after Confinement	Urinary Excretion of ⁵⁷ CoB ₁₂ (%)	No.	Month after Confinement	Urinary Excretion of ⁵⁷ CoB ₁₂ (%)
1	4	4.3	1	1	3.9
2	6	5.0	2	3	4.1
3	3	5.1	3	2	4.3
4	11	5.8	4	1	4.4
5	10	6.3	5	3	4.4
6	5	6.7	6	7	5.9
7	2	7.3	7	5	5.9
8	1	7.4	8	3	6.2
9	1	7.8	9	2	6.9
10	1	7.8	10	8	9.5
11	1	8.1	11	1	9.9
12	2	10.1	12	1	10.6
13	11	10.1	13	1	10.9
14	2	12.0	14	2	13.5
15	7	13.7	15	1	14.3
16	1	15.2	16	2	14.4
17	2	16.6	17	1	14.6
18	2	21.1	18	4	14.7
19	1	26.0	19	3	15.1
20	3	30.2	20	1	15.3
			21	9	19.3
			22	6	19.8
			23	4	22.2
			24	3	23.2
			25	5	24.2
			26	1	24.3
			27	2	24.4
			28	1	24.8
			29	1	30.4
			30	3	38.7
Mean		11.3	Mean		14.6
S.E.		1.5	S.E.		1.6

Patients.—These were 30 subjects suffering from megaloblastic anaemia. All showed classical or intermediate megaloblasts and giant myeloid cells in the bone marrow. The relation to pregnancy is shown in Table I.

The haematological methods employed were standard (Dacie, 1954). The absorption of radioactive vitamin B₁₂ was studied by a modification of the Schilling test, as described previously (Metz, Cassel, and Lewis, 1958).

Results

Controls.—The urinary excretion after oral administration of a dose of 0.6 µg. vitamin B₁₂ labelled with 0.15 µc. ⁶⁰Co to the control subjects ranged from 4.3 to 30.2% of the administered dose (mean value 11.3%).

Megaloblastic Anaemia.—The urinary excretion after administration of an identical dose of ⁶⁰CoB₁₂ to the group of patients with megaloblastic anaemia ranged from 3.9 to 38.7% of the administered dose (mean value 14.6%). The results are detailed in Table I.

Of the 30 patients studied, five showed a urinary recovery of less than 5% of the administered dose of vitamin B₁₂, while only one of the 20 control subjects absorbed less than 5% of the dose. In our clinic normal subjects usually absorb more than 5% of the dose, while patients with Addisonian pernicious anaemia absorb less than 4% of the dose, this defective absorption being corrected by the concomitant administration of intrinsic factor. In two patients where the urinary recovery of ⁶⁰CoB₁₂ was 3.9% and 4.3% respectively, the concomitant administration of a potent source of intrinsic factor together with the labelled vitamin B₁₂ did not enhance the absorption of the vitamin.

With the Schilling test, failure to collect all the urine passed during the 24-hour collection period may result in spuriously low values for ⁶⁰CoB₁₂ excretion. Of the five patients in the present series with a urinary excretion of less than 5%

of the administered dose, the volume of urine passed was 1,300, 1,280, 1,000, 710, and 510 ml. respectively. In the first four of these patients, the serum vitamin B₁₂ content was 270, 340, 450, and 150 µµg./ml. (In view of the small urinary output, the result of the Schilling test in the patient with a urinary volume of 510 ml. must be treated with reserve.)

Discussion

These results indicate that the absorption of vitamin B₁₂ in a group of patients suffering from megaloblastic anaemia associated with pregnancy is as efficacious as that of a control group of non-anaemic subjects. The mean value for the Schilling test in the anaemic group is in fact greater than that of the control group, but the difference is not statistically significant. In the cases where the absorption of vitamin B₁₂ is towards the lower limit of normal, the presence of a normal serum vitamin B₁₂ content suggests that malabsorption of the vitamin does not play a significant role in the pathogenesis of this form of megaloblastic anaemia.

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