

Vitamin B-12 and Anemia

[Drug Ther Bull.](#) 2009 Feb;47(2):19-21.

Oral or intramuscular vitamin B12?

[No authors listed]

Vitamin B(12) deficiency is common, becoming more so with age, and estimates of its population prevalence have ranged from 1.5% to 15%. If untreated, it can lead to megaloblastic anaemia and irreversible neurological complications. In the UK, the usual treatment is regular intramuscular injections of hydroxocobalamin. High-dose oral vitamin B(12) replacement is standard practice in some other countries and less costly. Here we review issues around adopting an oral vitamin B(12) replacement regimen more widely in the UK.

PMID: 19193702 [PubMed - in process]

Glossitis with linear lesions: an early sign of vitamin B12 deficiency.

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The classic oral manifestations of vitamin B(12) deficiency are considered nonspecific. We describe 4 patients with oral linear lesions associated with vitamin B(12) deficiency. Patients were free of neurologic symptoms and anemia at diagnosis. We believe that glossitis with linear lesions is an early clinical sign of vitamin B(12) deficiency. We recommend the determination of vitamin B(12) in such patients, even in the absence of anemia.

Publication Types:

- [Case Reports](#)

PMID: 19231648 [PubMed - indexed for MEDLINE]

Folate-vitamin B-12 interaction in relation to cognitive impairment, anemia, and biochemical indicators of vitamin B-12 deficiency.

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Previous reports on pernicious anemia treatment suggested that high folic acid intake adversely influences the natural history of vitamin B-12 deficiency, which affects many elderly individuals. However, experimental investigation of this hypothesis is unethical, and the few existing observational data are inconclusive. With the use of data from the 1999-2002 National Health and Nutrition Examination Survey (NHANES), we evaluated the interaction between high serum folate and low vitamin B-12 status [ie, plasma vitamin B-12 < 148 pmol/L or methylmalonic acid (MMA) > 210 nmol/L] with respect to anemia and cognitive impairment. With subjects having both plasma folate < or = 59 nmol/L and normal vitamin B-12 status as the referent category, odds ratios for the prevalence of anemia compared with normal hemoglobin concentration and impaired compared with unimpaired cognitive function were 2.1 (95% CI: 1.1, 3.7) and 1.7 (95% CI: 1.01, 2.9), respectively, for those with low vitamin B-12 status but normal serum folate and 4.9 (95% CI: 2.3, 10.6) and 5.0 (95% CI: 2.7, 9.5), respectively, for those with low vitamin B-12 status and plasma folate >59 nmol/L. Among subjects with low vitamin B-12 status, mean circulating vitamin B-12 was 228 pmol/L for the normal-folate subgroup and 354 pmol/L for the high-folate subgroup. We subsequently showed increases in circulating homocysteine and MMA concentrations with increasing serum folate among NHANES participants with serum vitamin B-12 < 148 pmol/L, whereas the opposite trends occurred among subjects with serum vitamin B-12 > or = 148 pmol/L. These interactions, which were not seen in NHANES III before fortification, imply that, in vitamin B-12 deficiency, high folate status is associated with impaired activity of the 2 vitamin B-12-dependent enzymes, methionine synthase and MMA-coenzyme A mutase.

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PMCID: PMC2647758 [Available on 2010/02/01]

Oral cobalamin (vitamin B(12)) treatment. An update.

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The objective of this review was to evaluate oral cobalamin (vitamin B(12)) therapy in adult and elderly patients, from the perspective of a hematologist. PubMed was systematically searched for English and French articles published from January 1990 to January 2007. Data from our working group, the 'Groupe d'étude des carences en vitamine B(12)des Hôpitaux Universitaires de Strasbourg', have also been included. Several prospective studies in well-determined population (n = 4), prospective randomized studies (n = 3) and a systematic review by the Cochrane group (n = 1) provide evidence that oral cobalamin therapy may adequately treat cobalamin deficiency, particularly hematological abnormalities or manifestations. These studies suggest that at least 1000 microg/day of oral cyanocobalmin are needed for pernicious anemia and a mean daily dose of 250 microg for food-cobalamin malabsorption. This present review confirms the previously reported efficacy of oral cobalamin treatment in adult and elderly patients.

Publication Types:

- [Research Support, Non-U.S. Gov't](#)
- [Review](#)

PMID: 19032377 [PubMed - indexed for MEDLINE]

Update of nutrient-deficiency anemia in elderly patients.

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Anemia, defined as a hemoglobin level < 13 g/dL in men and < 12 g/dL in women, is an important healthcare concern among the elderly. Nutrient-deficiency anemia represents one third of all anemias in elderly patients. About two thirds of nutrient-deficiency anemia is associated with iron deficiency and most of those cases are the result of chronic blood loss from gastrointestinal lesions. The remaining cases of nutrient-deficiency anemia are usually associated with vitamin B12, most frequently related to food-cobalamin malabsorption, and/or folate deficiency and are easily treated (nutrient-deficiency replacement).

Publication Types:

- [Research Support, Non-U.S. Gov't](#)
- [Review](#)

PMID: 19013375 [PubMed - indexed for MEDLINE]

Anemia following Roux-en-Y surgery for morbid obesity: a review.

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Morbid obesity is a significant problem in the Western world. Recently, there has been an increase in the number of patients undergoing surgical weight loss procedures. Currently, the most widely performed procedure is the Roux-en-Y gastric bypass operation which combines restriction of food intake with malabsorption of calories and various nutrients, resulting in weight loss and nutritional deficiencies, respectively. Various types of anemia may complicate Roux-en-Y and commonly include deficiencies of iron, folate, and vitamin B12. Iron deficiency is particularly common and may result from many mechanisms including poor intake, malabsorption, and mucosal bleeding from marginal ulceration. However, less appreciated etiologies of nutritional anemia include deficiencies of B-complex vitamins, ascorbic acid, and copper. Replacement of the missing or decreased constituent usually reverses the anemia. Since physicians of various medical and surgical specialties are often involved with the postoperative care of bariatric patients, a review of anemia in this patient population is warranted.

Publication Types:

- [Review](#)

PMID: 18791538 [PubMed - indexed for MEDLINE]

[Klin Lab Diagn.](#) 2008 Jul;(7):29-32.

[Morphometric characteristics of erythrocytes in B12-deficiency anemia (based on computer morphometric data)]

[Article in Russian]

[Potapova SG](#), [Shishina RN](#).

The paper presents the results of computed morphometry of peripheral red blood cells in elderly patients with B12-deficiency anemia before treatment. The study was performed in the fine Romanovsky-stained peripheral blood smears, by using an ASPEK Russian hematological cell image analyzer. The objective quantitative characteristics of the parameters of the major megaloblastic hematopoiesis markers (macro- and megalocytes) in peripheral blood are given. The composition of peripheral blood was determined from the content of red blood cells with varying amounts of hemoglobin.

Publication Types:

- [English Abstract](#)

PMID: 18756730 [PubMed - indexed for MEDLINE]

Review of interventions for the prevention and control of folate and vitamin B12 deficiencies.

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Folate and vitamin B12 deficiencies represent important and evolving global health challenges that contribute to the global burden of anemia, neurologic conditions, neurodevelopmental disorders, and birth defects. We present a review of population-based programs designed to increase consumption of folates and vitamin B12. A folic acid supplementation program targeting couples prior to marriage in China has led to optimal consumption of supplements containing folic acid and a significant reduction of neural tube defects (NTD). Supplementation programs that use mass community education show some promise, but have not been shown to be as effective as targeted education. The success of supplementation programs hinges on a strong and persistent educational component and access to the supplements. Fortification with folic acid has been shown to reduce the prevalence of NTD in the countries where it has been implemented. Challenges to fortification programs include identifying the appropriate delivery vehicles, setting the optimal fortification level, sustaining the quality assurance of the fortification level, and addressing regulatory challenges and trade barriers of commercially fortified flours. Supplementation and fortification are cost-effective and viable approaches to reducing the burden of NTD, anemia, and other conditions resulting from folate deficiency. The experience with interventions involving folic acid could provide a model for the subsequent development of supplementation and fortification programs involving vitamin B12.

Publication Types:

- [Review](#)

PMID: 18709892 [PubMed - indexed for MEDLINE]

Prepartum anaemia: prevention and treatment.

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This review focuses on the occurrence, prevention and treatment of anaemia during pregnancy in Western societies. Iron deficiency anaemia (IDA) is the most prevalent deficiency disorder and the most frequent form of anaemia in pregnant women. Minor causes of anaemia are folate and vitamin B12 deficiency, haemoglobinopathy and haemolytic anaemia. Anaemia is defined as haemoglobin of <110 g/L in the first and third trimester and <105 g/L in the second trimester. The diagnosis relies on haemoglobin, a full blood count and plasma ferritin, which can be supported by plasma transferrin saturation and serum soluble transferrin receptor. Among fertile, non-pregnant women, approximately 40% have ferritin of ≤ 30 microg/L, i.e. small or absent iron reserves and therefore an unfavourable iron status with respect to upcoming pregnancy. The prevalence of prepartum anaemia in the third trimester ranges 14-52% in women taking placebo and 0-25% in women taking iron supplements, dependent on the doses of iron. In studies incorporating serum ferritin, the frequency of IDA in placebo-treated women ranges 12-17% and in iron-supplemented women 0-3%. Requirements for absorbed iron increase during pregnancy from 0.8 mg/day in the first trimester to 7.5 mg/day in the third trimester, on the average approximately 4.4 mg/day, and dietary measures are inadequate to reduce the frequency of prepartum IDA. However, IDA is efficiently prevented by oral iron supplements in doses of 30-40 mg ferrous iron taken between meals from early pregnancy to delivery. Treatment of IDA should aim at replenishing body iron deficits by oral and/or intravenous administration of iron. In women with slight to moderate IDA, i.e. haemoglobin of 90-105 g/L, treatment with oral ferrous iron of approximately 100 mg/day between meals is the therapeutic option in the first and second trimester; haemoglobin should be checked after 2 weeks and provided an increase of ≥ 10 g/L, oral iron therapy has proved effective and should continue. Treatment with intravenous iron is superior to oral iron with respect to the haematological response. Intravenous iron is considered safe in the second and third trimester, while there is little experience in the first trimester. Intravenous iron of 600-1,200 mg should be considered: (1) as second option if oral iron fails to increase haemoglobin within 2 weeks; (2) as first option at profound IDA, i.e. haemoglobin of <90 g/L in any trimester beyond 14 weeks gestation; and (3) as first option for IDA in third trimester. Profound IDA has serious consequences for both woman and foetus and requires prompt intervention with intravenous iron. This is especially important for the safety of women who for various reasons oppose blood transfusions.

[Neth J Med.](#) 2008 May;66(5):216-7.

Anaemia and haemolysis in pregnancy due to rapid folic acid and vitamin B12 depletion.

[van Gellekom SA](#), [Lindauer-van der Werf G](#), [Hague WM](#), [de Vries JJ](#).

Publication Types:

- [Case Reports](#)
- [Letter](#)

PMID: 18490802 [PubMed - indexed for MEDLINE]

[J Pediatr.](#) 2008 May;152(5):731-3.

Neonatal vitamin B12 deficiency secondary to maternal subclinical pernicious anemia: identification by expanded newborn screening.

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A neonate with elevated propionylcarnitine on the newborn screen was found to have methylmalonic acidemia due to vitamin B(12) deficiency. The mother was also vitamin B(12)-deficient. This case illustrates the utility of expanded newborn screening for detection of vitamin B(12) deficiency, allowing prompt treatment and prevention of potential sequelae.

Publication Types:

- [Case Reports](#)

PMID: 18410783 [PubMed - indexed for MEDLINE]

[Eur J Haematol](#). 2008 May;80(5):448-51. Epub 2008 Jan 23.

Severe vitamin B12 deficiency resulting in pancytopenia, splenomegaly and leukoerythroblastosis.

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Deficiency of vitamin B12 is a well known cause of megaloblastic anemia and pancytopenia. Splenomegaly and leukoerythroblastosis are much less well known manifestations of B12 deficiency. We report a B12 deficient female with severe pancytopenia including normocytic anemia who also had enlarged spleen and circulating nucleated red blood cells as well as circulating immature myeloid cells. Although these findings are reported in the earlier literature, more modern reviews of the subject often fail to mention this association. We review the literature on these unusual manifestations of B12 deficiency and remind clinicians that splenomegaly and erythroblastosis can serve as diagnostic clues in cases of severe megaloblastic anemia secondary to B12 deficiency.

Publication Types:

- [Case Reports](#)

PMID: 18221385 [PubMed - indexed for MEDLINE]

[Eksp Klin Gastroenterol](#). 2005;(6):33-6, 112-3.

[Clinical and morphological characteristics of chronic gastritis complicated with B12- and iron-deficiency anemia]

[Article in Russian]

[Vorob'ev SA](#).

There was a study of 49 patients with iron- and B12-deficiency anemia. Morphological symptoms of chronic gastritis were revealed in 100% of patients. Chronic gastritis against the background of iron-deficiency anemia was characterized by superficial and focal atrophic lesions of the antral mucous coat, frequently--by erosions, and clinical manifestations in the form of intestinal indigestion and abdominal pains. Chronic gastritis against the background of B12-deficiency anemia always had an atrophic nature, was localized in the body and in the antral part of the stomach, and had clinical manifestations in the form of intestinal indigestion.

Publication Types:

- [English Abstract](#)

PMID: 17378384 [PubMed - indexed for MEDLINE]

[Eur J Haematol](#). 2008 May;80(5):448-51. Epub 2008 Jan 23.

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