# Antianemic agents

**Antianemic agents** are used in cases where we need to increase the hematopoiesis.

## Iron

The reference range of serum iron = 10,0–27,0 µmol/l. Iron deficiency anemia is expected predominately in:

- neonates, pre-term newborns,
- pregnant and breast-feeding woman,
- patients with small bowel disease,
- with increased blood loss to gastrointestinal tract, during metrorhagia, blood donors.

**Acute iron intoxication**
: The signs and symptoms are necrotising gastroenteritis with vomiting, stomach ache, diarrhea with bleeding, shock, lethargy and dyspnea. After mild improvement, there is severe metabolic acidosis, coma and death. It is very dangerous in children - we need to store them beyond their reach. The therapy is based on thorough gastric emptying and lavage phosphate or carbonate solutions. They form with iron non-absorbable complexes. Then we proceed with administation of *deferoxaminu* (i.m. or i.v.). It is a chelator agent which binds remaining iron in the gut.

**Chronic iron intoxication**
: Is call hemochromatosis or hemosiderosis. It leads to storage of iron in heart, liver and pancreas.

### Peroral therapy

It designated for long-term therapy: 3–6 months. It is well tolerated in most of the patients.

#### Negative side effects

*Nausea, abdominal cramps, constipation, diarrhea, black stool (with no clinical significance). These symptoms can be removed by lowering the dose.*

### Parentheral therapy

It is used in patients with malabsorption syndrom, with large blood loss etc.

For further information see Iron

## Vitamin B12 (cyanocobalamin)

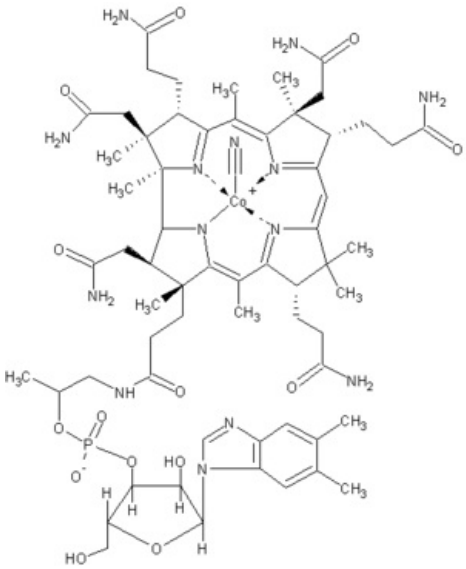
It is not synthetized by plants or animals. It is produced by microbial activity in digestive system or it is deliver to the organism with food containing milk, meat and eggs. It is absorbed after forming a complex with intrinsic factor (glykoprotein) - this complex is absorbed in distal ileum after binding to receptors with highly specific transport system.

They are used in therapy only in cases of it´s deficiency - for example in patients with pernicious anemia (in patients with normal level it´s administration has no value).

Considering fact, that most of the patiens have a failure to absorb B12, we need to treat this condition by it´s administration via parentheral route (by injection) - in irreversible cause of deficiency the lifelong therapy is necessary; reversible disorders leading to B12 deficiency are treated after the vitamin treatment is finished.

*Negative side effects:* rare– acne, allergic skin reaction, even with high doses there were not seen any toxic effects.

For further information see Vitamin B12


Vitamin B12

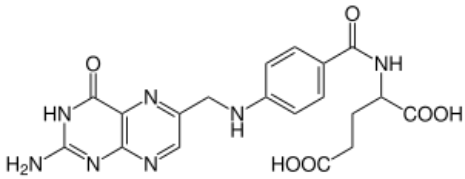
## Folic acid (acidum folicum, vitamin B9)

It is synthetized by plants and microorganisms = intake with food (meat – liver, kidney, yeast, leaf vegetable).

Folic acid deficiency is often caused by it´s lower intake in food, for example: the elderly, the poor, the ill (tumors, leucemia, skin diseases, chronic disease), pregnant woman, patients with hemolytic anemia (increased demand) - folate deficiency in mothers can be harmful to fetus (spina bifida), medication interacting with absorption or folate metabolism (fenytoin, isoniazid, some anticonvulsants and contraceptives inhibits the conjugases in gut; methotrexate, trimethoprim inhibits dihydrofolate reductase, barbiturates).

They are administered in p.o. (pills) – good absorption and tolerance.

For further information see Folic acid (vitamin B9)



Folic acid

## Vitamin B6 (pyridoxin)

For further information see Vitamin B6 (pyridoxin)

## Copper

For further information see Copper.

## Cobalt

- Essential element which is a part of vitamin B12.

## Hematopoetic growth factors

- Agents with glycoprotein hormone properties, which influence the production and differentiation of red blood cells in the bone marrow, some of them are:
  - **erythropoietin** (EPO),
  - **granulocyte growth factor** (G-CSF),
  - **monocyte-macrophage growth factor** (M-CSF),
  - **granulocyte-macrophage growth factor** (GM-CSF),
  - **interleukin 3**.

## Other agents

### Anabolics

- They stimulate the hematopoiesis by increasing the production of erythropoietin (↑ erytrocytů).
- *Indication:* aplastic anemia, myelofibrosis and myelodysplastic syndrome.
- **Nandrolon**.

### Corticosteroids

- They have impact on the hematopoiesis.
- *Indication:* autoimmune disease affecting the hematopoiesis (autoimmune hemolytic anemia, trombocytopenia, neutropenia), blood malignancies.
- **Methylprednisolone, prednisone**.

## Links

### Literature


- MARTÍNKOVÁ, Jiřina, Stanislav MIČUDA a Jolana ČERMÁKOVÁ. *Vybrané kapitoly z klinické farmakologie pro bakalářské studium : Terapie anémií* [online]. ©2001. [cit. 2010-07-08]. <http://www.lfhk.cuni.cz/farmakol/predn/bak/kapitoly/anémie-bak.doc>.


### Related articles

- Anémie
- Posthemorhagická anémie
- Hemolytická anémie
- Anemie megaloblastové
- Anémie ze snížené tvorby erythrocytů