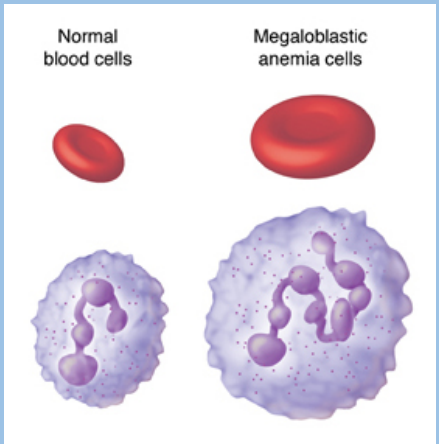
Megaloblastic Anemia

Types:

1) B_{12} deficiency
2) Folate deficiency
3) Pernicious anemia (also known as B_{12} malabsorption)

Megaloblastic anemia is defined as the formation of large, irregular and immature red blood cells.



https://www.fairview.org/hlimg/krames/176946.jpg Retrieved 10/20/2021

Patients with megaloblastic anemia may experience symptoms such as:

- Irritability, pallor, pale sclera, pancytopenia
- Chromosomal damage
- B_{12} neuropathies
- Homocysteinemia
- Memory loss/ personality changes (more prevalent in older patients)
- Increased risk of cancer (AMAG patients)

While the primary B_{12} and Folate deficiencies can be attributed to a lack of oral intake. Pernicious anemia can be attribute to secondary conditions such as:

- Pancreatic disorders
- Surgeries resulting in the loss of HCl, digestive enzymes, intrinsic factor (IF) and/or ileal function
- GI disorders (Autoimmune atrophic gastritis, Loss of gastric mucosa, gastrectomy, Hypochlorhydria, H_2 blocker medication, protein pump inhibitors, insufficient pancreatic protease, intestinal bacteria overgrowth and disorders of the ileac mucosa)
- In older patients, the most common cause is metaplastic atrophic gastritis (AMAG)

Vitamin B_{12} & Folate Intake

Normal digestion of B_{12} begins with the intake at the mouth and travels to the stomach where it would be met by a gastric glycoprotein known as intrinsic factor (IF). The purpose of the intrinsic factor would be to bind to the B_{12} and transport it to the intestines. However whenever there is an interruption, such as one of the secondary conditions previously mentioned, the B_{12} becomes unescorted and unable to be further digested.

Folate on the other hand does not require intrinsic factor (IF) to be digested. It is able to move throughout the gastrointestinal system to be broken down and absorbed. Conditions such as age, pregnancy, medication interaction, etc. can interrupt the digestion of folate thus leading to deficiency. Without enough folate DNA synthesis will become hindered, producing abnormal genetic material that produces large/undeveloped red blood cells.

Who's at Risk?

Those most at risk of developing megaloblastic anemia include:

- Pregnant women with insufficient stores
- Infants with predating deficient mothers
- Patients with atrophic gastritis
- Chronic alcohol users
- The elderly/ those with deteriorating health
- Risk increases with Institutionalization

Medical Nutrition Therapy (MNT)

The recommended course of treatment is dependent on whether or not the anemia is secondary to an impaired absorption.

Primary anemia should be treated primarily with oral supplementation of either vitamin B_{12}, Folate or both.

Secondary anemia should be treated with alternative supplementation in conjunction with the underlying condition.

Both anemias will require routine follow up lab testing to ensure that the deficiencies do not reoccur.

- Transcobalamin (B_{12})
- Serum Homocysteine
- Serum Folate

Nutritional education is the key to patient recovery:

It will become the responsibility of the patient to learn about the importance of vitamin B_{12} and Folate. And how best to incorporate this knowledge into their daily lives.

Dietary intake of vitamin B_{12} and Folate remain the recommended primary source of preventing/ treating megaloblastic anemia. Foods such as yeast, milk and meats are rich in not only these nutrients but also other essential micronutrients as well

References

Nelms, M., Sucher, K. P. (2020). *Nutrition therapy & pathophysiology (4th ed.)*. Cengage Learning.