

**ADVERSE EFFECTS
OF
PROTON PUMP INHIBITORS
(Prilosec®, Protonix®, Prevacid®,
Nexium®, AcipHex®, Dexilant®,
Zegerid®)**

I. Deficiency of essential amino acids.

In the absence of acid in the digestive enzyme pepsin cannot be produced. Pepsin is one of three enzymes in the body that can metabolize amino acids. The other two being trypsin and chymotrypsin which originate in the pancreas.

The failure to break down proteins can lead to a deficiency of essential amino acids (histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan and valine.)

The chronic suppression of acid that occurs with the long-term use of proton pump inhibitors can, therefore, potentially lead to a deficiency of essential amino acids.

II. Iron malabsorption

Ferrous iron (FE 2⁺) is more easily absorbed than ferric iron (FE 3⁺). This change from ferrous to ferric is largely dependent on the presence of gastric acid in the stomach and on another chemical known as ceruloplasmin within the intestine lining cells. Chronic iron deficiency anemia may result from long-term suppression of gastric acid using proton pump inhibitors.

III. B12 malabsorption

B12 enters the body bound to animal derived protein. Acid is required to separate the B12 vitamin from the protein. Suppression of gastric acid by using a proton pump inhibitor can, therefore, result in B12 deficiency. This

finding has been verified in studies of individuals treated with proton pump inhibitors for two weeks that showed an 88% reduction in B12 absorption.

IV. Folic acid malabsorption

Suppression of gastric acid with proton pump inhibitors interferes with folic acid absorption. Taking proton pump inhibitors causes chronic acid suppression that results in at least 50% folic acid malabsorption.

V. Calcium malabsorption

Calcium malabsorption increases by fivefold in an acid environment. Suppression of the gastric acid by using proton pump inhibitors, therefore, has the potential for causing calcium malabsorption.

Other potential adverse reactions to proton pump inhibitors include the following:

- **Reduced antibacterial function of gastric acid causing a likelihood of bacterial overgrowth in the small intestine (SIBO).**
- **Association with increased risk of Clostridium difficile colitis.**
- **Increased risk for community acquired pneumonia.**
- **Reduction in magnesium absorption.**
- **Association with increased risk of bone thinning (osteoporosis and osteopenia) although there still remains conflicting views on whether this association exists.**
- **Other rare adverse reactions include a low platelet count, muscle inflammation, and chronic kidney disease**

- **Rebound increases in acid upon rapid cessation of using proton pump inhibitors.**

Proton pump inhibitors should be taken on an empty stomach at least 30 minutes before the next meal.

Proton pump inhibitors should not be taken for more than 8 weeks unless specifically recommended by your healthcare provider.