

**Epidemic proportion of deficiency of Vitamin B 12, causes permanent impairment to the health. A Public Health Problem, Need immediate attention of all concerned!**

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The physicians are the watch dogs of the community and God has blessed us the duty to work for our entire lives to understand the mysteries of the human body. As more and more information is revealed to us we try to share with the community so that they could do better and live more purposeful and healthy life.

Vitamin B<sub>12</sub>, the heaviest and most complex of all vitamins, is a water-soluble vitamin naturally present in animal foods. It plays key role in the normal functioning of the brain and nervous system and for the formation of blood. It is involved in metabolism of every cell of human body especially affecting DNA synthesis. Cyanocobalamin is the form of vitamin B<sub>12</sub> used medically. Additionally, it acts as a cofactor in multiple physiologic pathways in humans.

Clinical deficiency of vitamin B<sub>12</sub> usually takes years to develop because the daily requirement is small and can be adequately met in most diets (except strict vegetarians) and because the body stores vitamin B<sub>12</sub> Cobalamin or vitamin B12 is an organometallic compound not produced by the human body but is incorporated, instead, into the diet via meat and dairy products. It is bound in the duodenum to intrinsic factor (IF). Duodenum and stomach produce the intrinsic factor. Its secretion is hampered by ant acids and increased level of Gastrin. This cobalamin-IF complex is resistant to proteolysis and is absorbed into the blood stream as it makes its journey to the distal small bowel. This route of B12 intake is adequate for everyone except for strict vegetarians and their breastfed children.

**Vitamin B 12 deficiency has so bizarre presentations, it becomes difficult to have the wildest imagination of its symptoms. Its deficiency has serious implications on human body and it must be substituted at the earliest. It is imperative to diagnose the condition at the earliest.**

**It can mimic as Acute Leukemia**, a deadly blood cancer. These could be the cases of completely curable pernicious anemia. {Cristi Aitelli, BS; Lori Wasson, DO; Ray Page, DO, PHD, Southern Medical Journal, dated 4.23.2004}

**There could be increased loss of bone of hip joints in women causing fractures.** This can be a real problem in middle aged ladies who are active and had not taken any hormone and are still losing bone mass in ankles and hips

**There is definite association of B12 deficiency in all cases of diabetes type 2** taking very commonly used first line drug-metformin, which can improve cardiovascular morbidity and mortality in the patients. It becomes difficult to assess the deficiency in these patients as all of them are advised multivitamins by the doctors and its deficiency cannot be imagined.

**Metformin induced B 12 deficiency can cause peripheral neuropathy.** There is no anemia and it can be missed . Failure to diagnose can result into

progression of neuronal damage to the central and peripheral nerves which can be arrested and cannot be reversed if treated with Vit.B 12.

**Unexplained chronic cough** may be caused by sensory neuropathy of pharynx and larynx. Vitamin B 12 deficiency reduces the threshold to histamine and vitamin B 12 supplements can raise the threshold to histamine and can relieve cough.

**Stunning neurological impairment was caused by Vit B 12 deficiency in the full term breast fed children of vegan mother**-failure to thrive and lethargy. Vomiting regularly and poor appetite. The mother had consumed vegetarian diet for 7 years before the birth of the baby. Serum B 12 was very low, once she was given cyanocobalamin, the baby became normal.

**One year old boy of vegetarian mother developed hypotonia** which caused the weight loss, decreased activity and psychomotor regression. Only detailed investigation could pinpoint the real cause was the deficiency of vit B 12.

**Can cause sub acute combined degeneration of spinal cord** and can accentuate a very serious disorder of amyotrophic lateral sclerosis. And associated with it are serious symptoms like sore tongue, paresthesias, and weakness. The patients can have numbness in body, difficulty in walking, eye sight impairment, psychiatric symptoms. There could be signs of muscle weakness, absent ankle reflexes or excessive knee jerks, bowel and bladder incontinence., light headedness impaired smell and taste. Can have low grade fever, weight loss, fatigue and malaise. Gastrointestinal symptoms include flatulence, constipation, diarrhea.

**Tiredness, fatigue, lack of sleep are common symptoms in old age** and in many other situations when the work requires less sleep and more working hours. Even if no deficiency is detected there are definite benefits of taking cyanocobalamin 1000 micrograms orally every day or 1000 mcg im monthly injections or hydroxycobalamin 5mgms im injections twice weekly.

**Kids getting ileocystoplasty done as an urgent surgical measure develop B12 deficiency.** These can also be treated by 500 micrograms once a day orally. As it is observed that B 12 is principally absorbed through ileum.

**65 years or older suffer less from depression** in case the diet is supplemented with B 12. Over all health improves and the need for medication decreases.

**Raised plasma homocysteine level is potent independent risk factor for heart diseases.** This can be checked with use of B 12, B6 and folic acid. And most of the patients do not take adequate dose of B 12 which can really help reduce the risk.

**Pancytopenia**- reduced red blood cell count, white blood cell count and platelets, a really fatal condition in a strict vegetarian lady of 85 years was found. She was very lucky that her test for B 12 was done and B 12 was not detected in blood. So blood transfusion and B 12 saved her life.

**Mild Cognitive Impairment[ MCI] cases** showed definite slow down and improvement in the rate of brain atrophy with B12 supplements. Individuals who had higher vitamin B<sub>12</sub> levels were 6 times less likely to experience brain-volume loss, a new study shows. The results are published in the September 9 issue of Neurology.

### **B 12 can curb the risk of Alzheimer's Disease.**

**PPI inhibitors or H2 antagonists which are used to reduce acidity can cause B 12 deficiency.** Gastrin is a potent acid secretagogue that is released from "G" cells in the antrum of the stomach and the duodenum in response to a meal. The feedback inhibition for gastrin is acid present in the lumen of the stomach and small intestine. The use of any agent that inhibits gastric secretion of acid (H2-receptor antagonists or PPIs) will result in a rise in serum gastrin as the feedback inhibition of gastrin release is diminished. Gastrin levels are commonly elevated in patients taking PPIs, but only unusually to a significant degree.

**Severe Dyspnea, blood stained sputum and productive cough caused by severe anemia in a young 28 year old vegetarian lady in Africa.** High-output cardiac failure, the explanation for this patient's fulminant presentation in pulmonary edema, may occur in the setting of profound anemia. Milder anemia usually only exacerbates heart failure from another cause. In this case, pregnancy as well as postpartum bleeding likely worsened the baseline anemia from a lack of vitamin B12.

**Severe Cervical Pain caused by B 12 deficiency.** Doctors suspected it to be neoplastic but MRI confirmed the cause was Sub Acute Combined Degeneration of Spinal cord.

**Duchenne Muscular Dystrophy is a genetic disorder:** The U.S. Food and Drug Administration (FDA) has approved a nasal spray formulation of cyanocobalamin for the treatment of vitamin B<sub>12</sub> deficiency; a new indication for orphan drug PTC 124, allowing its use in the treatment of Duchenne muscular dystrophy due to a gene nonsense mutation.

**Optic Neuritis in pregnancy** could be caused by along with other factors B 12 deficiency also.

**Celiac Disease, Crohn' Disease and Patients who had surgery of ilieum** do suffer from deficiency and can take the supplement for their life. It should certainly improve their body resistance and there is no harm.

### **Recommendations for Vegetarians, Non-Vegetarians, pregnant and lactating mothers.**

Adult daily dose is 2 to 3 µg per day.

The dose for pregnant and lactating mothers is 2.6 to 2.8 µg per day.

The requirement of Vit B12 for normal health is very small. This much of micronutrient in a vegetarian diet is not available. Even non vegetarian diet fulfills this requirement with lot of impediments as many drugs interfere in its proper absorption from intestines. So there is definite and dire need of this vitamin in all people over 50 years.

Dietary supplements are needed for all persons in old age as there is so much risk of neurodegenerative diseases like Parkinson's, Alzheimer, hearing loss or visual impairment related to its deficiency. No need of taking risk. Some favorable facts are so far its toxicity has not been found and the other is the excess of Vitamin B 12 gets stored in the body Taking these facts into consideration, the following recommendation can be followed and all persons must keep testing the level of B12 every year.

**Diabetics and Vegetarians who had not taken any supplement any time they may take.**

Cyanocobalamin 1000 microgram or 1mg every day for 2 months then they may reduce this supplement to twice a week for entire life.

**Non Vegetarians:** Can take Cyanocobalamin 500 microgram once every week for life.

[ I had tried to find recommendations for these groups I did not find any so this is my suggestion and you may consult your doctor for better advice.]

**Note:** I take this opportunity to thank the medical fraternity associated with Medscape CME, of which I am the member. This is non commercial and purely dedicated to the welfare of the world community through the continuous and dedicated work in the most refined, state of art and the most advanced Hospitals and Laboratories. This write up is extracted from, [www.medscape.com](http://www.medscape.com), The above writing would be put up in the website, [www.gurunanakhealing.com](http://www.gurunanakhealing.com), which is again a non commercial charitable institution. We have been successful in healing of many incurable patients in our more than 23 years of service.

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