VITAMIN DEFICIENCIES

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B 12 DEFICIENCY

Symptoms of B12 deficiency often go undiagnosed. This is largely because there are a variety of symptoms and very often they can be mistaken for something else. For example, many of the early B12 vitamin deficiency symptoms are often brushed off as the normal signs of aging. At the other end of the spectrum, some people experience very dramatic symptoms even when they are only experiencing moderately low (or low/normal) levels. In these cases, most of the time a B12 deficiency is not considered as a potential cause of the problem because the symptoms are so significant that it does not seem possible that moderately low or borderline B12 levels could be the culprit. Sadly, it is not at all uncommon for B12 deficiency symptoms to be mis-diagnosed or the signs of B12 deficiency to be ignored all together!

Here are some of the common symptoms of Vitamin B12 deficiency:

• **Neurological B12 Vitamin Deficiency Symptoms**
  • Mental confusion
  • Delusions
  • Paranoia
  • Headaches
  • Depression
  • Impulse Control
  • Pins and needles in the extremities
  • Balance issues

• **Gastrointestinal Symptoms of B12 Vitamin Deficiency**
  • Nausea
  • Vomiting
  • Heartburn
  • Bloating
  • Loss of Appetite
  • Weight Loss
  • Diarrhea
  • Constipation

• **Other Symptoms of B12 Vitamin Deficiency**
• Fatigue
• Paleness
• Shortness of breath that results from only very light exertion
• White spots on the skin (typically the forearm) due to decreased melatonin
• Hair loss
• Bruising that occurs without reason
• Dizziness

These varied B12 deficiency symptoms are the result of the body not creating sufficient red blood cells due to the decreased levels of B12. Red blood cells are required to carry oxygen to all of your cells so having insufficient red blood cells essentially starves your body of oxygen.

**Pernicious anemia**

Pernicious anemia is caused by an autoimmune disease; a person's own immune system attacks good parts of the body, as if they were bacteria or viruses.

The immune system of patients with pernicious anemia creates antibodies which attack the lining of the stomach, damaging cells that produce intrinsic factor. Intrinsic factor is a substance that is secreted by the gastric mucous membrane (lining of the stomach) and is vital for the absorption of vitamin B12 in the intestines. If the production of intrinsic factor is undermined, vitamin B12 cannot be absorbed into the body properly.

**Where to Get Your B12**

B12 is produced by microorganisms, bacteria, fungi, and algae, but not by animals or plants. B12 is found in animal products because they concentrate the nutrient after ingesting these microorganisms along with their food in their flesh, organs, and byproducts (e.g. eggs and dairy). Also, ruminant animals (such as cows, sheep, and goats) have bacteria in their rumen that produce vitamin B12.

In a vegan diet, vitamin B12 may be found in fortified plant milks, cereals, and other foods, such as nutritional yeast.

The bottom line is that it seems the best way to supplement to maximize absorption and maintain optimal blood levels of B12 is for vegan adults (as well as non-vegan adults over the age of 60) should consider supplementing with these doses of vitamin B12 which any good multi-vitamin should provide!

50 mcg once/twice a day OR

100 mcg once/twice a day OR

2,500 – 5,000 mcg once a week

**NOTE ON B12 TESTING:** One of the most important things to understand about B12 deficiency is that the serum B12 is not a very reliable marker for diagnosing B12 deficiency. When you measure B12 in the serum, you’re measuring all of the different cobalamins. Cobalamins are all the different B12 compounds. That ranges from the most inactive forms of cobalamin, like cyanocobalamin, to the more active forms of cobalamin, like methylcobalamin and adenosylcobalamin, which are referred to as active B12. That’s the type of B12 that can actually be delivered, get in the cells, and do what it’s supposed to do. Then there are intermediate forms
of cobalamins, like hydroxocobalamin, which are not super active, but more active than something like cyanocobalamin.

When you measure serum B12, you’re measuring all of those different B12s. So it would be possible to have a normal or even high level of serum B12, and have most of that be inactive, and still be suffering from B12 deficiency, because you don’t really have enough of the active B12 that gets in the cells. What are those sensitive markers? Well, the most practical and most available at this time is methylymalonic acid, or MMA for short. You can test methylymalonic acid in the urine or the serum. Methylymalonic acid is an organic acid. It’s a by-product of normal cellular metabolism. It’s converted into succinic acid via a B12-dependent enzyme. That enzyme only can use active B12. So if methylymalonic acid (MMA) is elevated, it suggests there’s not enough active B12 to make that conversion. Therefore, it’s a sensitive indicator for active B12 deficiency. This is done through our OAT TEST (organic acid urine profile test).

**LOW B6 symptoms:**

**Vitamin B6** - may be associated with less than optimum health conditions (low intake, malabsorption, or dysbiosis). Supplementation with B6 or a multivitamin may be beneficial. Low B6 symptoms: Twitching, seizures, convulsions, mood or mental changes, anemia, fatigue, heart rate irregularities, pale skin, dizziness, headaches, cold extremities, unusual body sensations (numbness, tingling or burning in feet or hands), anxiety, chronic fatigue, insomnia, indigestion, skin rashes, extreme pms, restlessness, hair loss, cracks on tongue or lips, weakness, trigger finger, carpal tunnel, swollen hands, thumb-wrist-joints painful.

**Foods High In B6**

Sweet potatoes, potatoes, spinach, cabbage, turnip greens, garlic, winter squash, bok choy, bell peppers, avocado, green peas, lentils, lima beans, pinto beans, bananas, and sunflower seeds.

**Low B1 (Thiamine) symptoms:**

Deficiency of vitamin B1 may lead to chronic diseases. One of them is Beriberi which is a neurological and cardiovascular disease. This has been associated with cardiovascular disease and is one of the most chronic symptoms of the deficiency of vitamin B1. In addition, B1 vitamin benefits include prevention of lung congestion, increased heart rate, as well as heart failure. Once again, B1 vitamin benefits include prevention of abnormal development of muscles and nerves, pricking and burning sensation in the toes and feet, leg cramps and atrophy or wasting of the muscles. More symptoms include weight low, weakness, irregular heart rate, emotional disturbances, night terrors, panic attacks, poor memory, gastro issues, hair loss (such as alopecia, etc.), Alzheimer’s, cataracts.

**Foods High In B1**

Asparagus, Brussels sprouts, green peas, beet greens, spinach, sweet potatoes, navy beans, black beans, pinto beans, lima beans, kidney beans, lentils, peanuts, unpolished rice, barley, oats, sunflower seeds, sesame seeds, flax seeds, watermelon, oranges

**Low B2 (riboflavin) symptoms:**

Riboflavin deficiency symptoms include:

- Bloodshot eyes
- Sore tongue and lips
- Infection in the mouth and throat
- Extreme and unusual sensitivity to light
- Irritability in the eyes
- Chapped lips & Migraines

Women need to take special care to ensure that they don't have a vitamin deficiency as riboflavin deficiency causes problems in the reproduction system, growth and repair of body tissues, as well as problems in the immune system. A vitamin B2 deficiency affects the metabolism of carbohydrates, fats, ketone bodies, and proteins in the body. So it can be said that a vitamin deficiency directly affects a person's energy level. Another factor is that vitamin B2 deficiency results in other vitamin deficiencies as well.

**Foods High in B2** Beet greens, spinach, asparagus, mushrooms, collard greens, sweet potatoes, green peas, almonds, sun dried tomatoes

**LOW VITAMIN B3 (niacin)**

Low Vitamin B3, also called niacin and niacinamide, is an important water-soluble vitamin that can be found in many common foods including certain types of meat and organ meat, tuna fish, seeds, mushrooms, and others. Vitamin B3 helps maintain skin health, supports brain function, lowers cholesterol, can help treat diabetes, lowers inflammation, helps with joint mobility and to treat arthritis.

When a vitamin B3 niacin deficiency is seen, the following are signs and symptoms:
- Pellagra- characterized by skin inflammation, hallucinations, digestive distress. Usually occurs in malnourished people or those with alcoholism and can include rash, stomatitis, diarrhea, and mental problems
- Mucous membrane swelling- symptoms which affect the mouth, vagina and urethra tongue can cause pain in the mouth, increased salivation, and edema of the tongue, and ulcers
- Skin symptoms include several types of lesions and acne
- Gastrointestinal (digestive) disturbances- symptoms include burning in the pharynx and esophagus, stomach and abdominal discomfort, constipation, nausea, vomiting, and diarrhea
- Brain impairment and psychosis- impaired consciousness, cognitive decline (dementia), disorientation, confusion, depression, mania, or paranoia.

**Food high in B3 (niacin):** sunflower seeds, split green peas, mushrooms, grains, brown rice, barley, buckwheat, potatoes, tomatoes

**Low B5 (Pantothenic acid) symptoms**: Signs and Symptoms of Deficiency:

Fatigue, Elevated cholesterol, Burning and pain in the arms and legs, Burning feet, Nausea, Indigestion, Irritability, Fainting, Hair loss, Elevated heart rate, Susceptibility to infection, Premature graying of the hair, **Gluten sensitivity intolerance or celiac disease**

Vitamin B5 has been shown to be beneficial for the following conditions:

Depression, Dermatitis, Adrenal disease (adrenal burn out or failure), **Headaches**, Insomnia, High Cholesterol, Chronic Fatigue syndrome, Fibromyalgia
Foods High In B5

Avocado, crimini and shitake mushrooms, sweet potatoes, green peas, lentils, corn, sun dried tomatoes, cauliflower, potatoes

Low Vitamin C Symptoms:

The first symptoms of vitamin C deficiency tend to be:

▪ Tiredness and weakness.
▪ Muscle and joint pains.
▪ Easy bruising.
▪ Spots that look like tiny, red-blue bruises on the skin. Other symptoms can include:
  ▪ Dry skin.
  ▪ Splitting hair.
  ▪ Swelling and discoloration of the gums.
  ▪ Spontaneous bleeding from the gums.
  ▪ Nosebleeds.
  ▪ Poor healing of wounds.
  ▪ Problems fighting infections.
  ▪ Bleeding into joints, causing severe joint pains.
  ▪ Changes in the bones.
  ▪ Tooth loss.
  ▪ Weight loss. If not diagnosed and treated, vitamin C deficiency can lead to jaundice, generalized edema (swelling), and shortness of breath, nerve problems, fever and convulsions. Bleeding inside the brain and around the heart can cause death in some people with untreated vitamin C deficiency.

Plant foods high in Vitamin C:

Potatoes, acerola cherries, chili peppers, yellow peppers, blue berries, kale, pineapple, broccoli, cabbage, mango, Brussels sprouts

SEROTONIN Deficiency symptoms:

The following are common symptoms of serotonin deficiency:

▪ Anxiety in typically low stress situations
• Impatience without explanation
• Fatigue when you should feel rested and energized
• Cognitive impairment (inability to focus, poor memory, lack of mental clarity)
• Negative thoughts with no apparent cause
• Agitation
• Mania/obsession
• Mood swings
• Strong sugar cravings
• Indifference to situations you typically would care deeply about
• Excessive worrying
• Inability to fall and stay asleep
• Moderate to overwhelming sadness  Feeling worse and agitated during bad/dark weather

Dopamine deficiency signs/symptoms:

• Reduced ability to feel pleasure
• Flat, bored, apathetic and low enthusiasm
• Depressed
• Low drive and motivation
• Difficulty getting through a task even when interesting
• Procrastinator/little urgency
• Difficulty paying attention and concentrating
• Slowed thinking and/or slow to learn new ideas
• Crave uppers (e.g. caffeine/nicotine/diet soft drinks) Use these to improve energy/motivation/mood
• Prone to addictions (e.g. alcohol)/addictive personality
• Shy/introvert
• Low libido or impotence
• Mentally fatigued easily and physically fatigued easily

• Sleep too much and trouble getting out of bed

• Put on weight easily

• Family history of alcoholism/ADD/ADHD

Dopamine can be raised effectively using either nutrient based therapies or medications. Dopamine is synthesized from the amino acid tyrosine.