The Ironic Truth About Iron

The Most Toxic Metal You've Been Told to Get Too Much Of

LELAND STILLMAN, MD

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LELAND STILLMAN, MD

The Iron Paradox

1. Iron is an essential element for life
2. Iron creates free radicals, which can destroy biological systems
3. The “Free Radical Theory of Aging”
4. Is iron a nutrient? Or a poison?
    a. How much should we really be getting of it?
    b. Why do I now rarely, if ever, use supplemental iron in my practice?
    c. Why do I think that blood-letting, or therapeutic phlebotomy, is due to make the greatest therapeutic comeback of all time?

Iron: Nutrient or Poison?

1. "The dose makes the poison." - Paracelsus
2. What's the right dose of iron?
3. Only 3-5 grams of iron in the whole body.
    a. The body has no way to actively excrete iron.
        i. Losses = 1 to 1.5 mg daily
    b. Tends to accumulate over time.
        i. 2 cups of spinach (60 grams) = 1.6 mg iron
        ii. ½ pound steak = ~4 mg of iron

Iron: Supply and Demand

1. We get iron from food
2. Why might we fail to absorb iron?
    a. Gastrointestinal compromise
    b. Low stomach acid
    c. Lack of vitamin C
3. How do we lose iron?
    a. Blood loss due to injury
    b. Menses
    c. Pregnancy and childbirth
    d. Parasites, like hookworm

Iron: Supply and Demand

1. We're not losing iron like we used to.
    a. We have minimized blood loss due to trauma.
    b. Birth control prevents blood loss due to menses.
    c. We've minimized blood losses in childbirth.
    d. We've eradicated parasites.

Iron: Supply and Demand

1. We're eating a lot of iron.
    a. We're fortifying our food with iron.
    b. We eat an iron-rich diet with lots of red meat and fortified cereals/grains.
    c. 1500-2000 calories tends to run between 15 and 50 mg DAILY
2. We're taking a lot of iron.
    a. Iron infusions.
    b. Iron pills.
    c. Prenatals.
    d. Multivitamins.

Iron: Supply and Demand

1. What does it take to make a pint of blood?
    a. 220 to 250 mg of iron
    b. At an RDA of 8 mg, assuming 6% absorption, this would take over 400 days to restore!
    c. 220 mg iron = 31.25 pounds of steak
2. How many pints do you have?
    a. 4-6 liters
    b. 1 liter = 2 pints
    c. 8-12 pints of blood

Iron: Supply and Demand

1. Donation = 1 pint
    a. 4 pints = 1 gram iron
    b. Every eight weeks = 32 weeks (224 days) to get rid of one gram of iron
2. How long does it take to replace one pint of blood?
    a. 220 to 250 mg of iron
    b. At the RDA of 8 mg, assuming 6% absorption…
    c. You would need to consume over 3,600 mg of iron
    d. At the RDA of 8 mg… this would take over 450 days!

Iron: Supply and Demand

1. What if you're eating more iron than this?
    a. Most people get between 15 and 50 mg of iron daily
    b. At 15 mg and 6% absorption… 244 days
    c. At 50 mg and 6%… 73 days
2. What if you're absorbing 18%?
    a. At 15 mg and 18%… 81 days
    b. At 50 mg and 18%… 24 days

How much are you really getting?

How much do you really have?!

LELAND STILLMAN, MD

Iron and Aging

1. What's so bad about iron?
    a. Iron generates an abundance of free radicals.
2. The Free Radical Theory of Aging
    a. The more you make, the faster you age.
    b. We do need free radicals - they are important signaling molecules.
3. All metals generate free radicals at some level.
    a. Iron is the chief offender.
    b. It is also one of the most abundant metals in the body.
    c. This means it is one of the chief drivers of oxidative stress/free radicals/aging in the body.
4. How big of a problem is this?

Iron and Aging

1. "Iron overload is an exceedingly common malady in the population and it is easily diagnosed, but it is under-addressed. It leads to heart disease, diabetes, cancer and numerous other chronic and debilitating illnesses."
    a. Luca Mascitelli, MD
2. "Among well-documented health hazards, iron excess must remain one of the world's best kept secrets."
    a. Leo Zacharski, MD
3. "for essentially all diseases – infections, cancers, Alzheimer's, Parkinson's, diabetes, gout, osteoporosis, cardiovascular ills, and more – iron burden is a dangerous risk factor."
    a. Eugene Weinberg, PhD

What are we getting wrong about iron?

1. Is iron a nutrient or a poison?
2. Are we iron-deficient or iron-overloaded?
3. Should we really be fortifying our food with iron?
4. If iron overload is a problem, what can we do to protect ourselves from it?
5. If anemia isn't about iron, then what it is about?

Anemia: Not Just a Disease of Iron Deficiency

1. Anemia = lack of red blood cells.
    a. Excessive losses.
    b. Inadequate supply.
2. Anemia has been a major medical problem.
    a. You need blood to survive, but it's easy to lose.
    b. The more blood you have, the better you perform athletically.
    c. You can lose about two thirds of your blood volume before you die - so you have a lot of reserve in terms of blood volume.
3. What's the whole story of anemia?

Unraveling Anemia

1. What nutritional deficiencies cause anemia?
    a. Vitamins A and C
    b. Iron, copper
    c. Vitamins B-6, folate (B-9), and B-12
    d. Many more...
2. How do we know this?
    a. Diets deficient in any one of these nutrients predictably reproduce anemia.
    b. Both in animals and in humans.
3. These nutrients are abundant in traditional/ancestral diets.
4. Modern people tend to be deficient in these nutrients.

How do nutritional deficiencies cause anemia?

1. Anemia is due to:
    a. Impaired production of red blood cells.
    b. Excessive losses or destruction of red blood cells.
    c. Nutritional deficiencies can contribute to either.
2. Impaired production:
    a. Iron, copper, and other minerals are necessary for red blood cell production.
    b. Vitamin A, vitamin C, folate, B-12, and B-6 are necessary for red blood cell production.

How do nutritional deficiencies cause anemia?

1. Excessive losses:
    a. Bleeding - loss of structural integrity in the body and its structures.
    b. Not just about trauma - scurvy can cause bleeding.
    c. Oxidative stress - excessive oxidative stress breaks down red blood cells prematurely.
2. How prevalent are these problems in modern people?
    a. Extremely

Anemia in History

1. Hunter-gatherer and early agrarian societies gravitated toward foods dense in the nutrients that prevent anemia.
    a. Fresh, whole foods
    b. A wide, wide variety
    c. Local, seasonal eating
    d. Lack of pollutants to cause modern diseases
    e. Active lifestyle
2. They had problems with BLOOD LOSS anemia

Anemia in History

1. The Industrial Revolution made these foods and lifestyle choices difficult to impossible.
    a. Processing removes nutrient-dense food components, leaving behind “empty” calories.
    b. Canned or preserved food - rather than fresh - became normal.
    c. Air, light, water, sound, and EMF pollution can all destroy or waste nutrients.
    d. Cheap drugs of abuse - alcohol, tobacco, and more.
2. What was the result?

Anemia in the Industrial Revolution

1. Nutritional anemias became a major problem in the industrialized world.
2. How did physicians respond?
   a. Research
   b. Treatment
3. What did they find?

The Nobel Prize of 1934

1. George Whipple, George Minot, William Murphy won the Nobel Prize in Medicine in 1934 for the discovery of beef liver as a cure for pernicious anemia.
    a. They would inject 3 grams of beef liver extract intramuscularly, prepared from 100 grams of beef liver.
2. Much of the population was still eating:
    a. Copper and vitamin A rich foods
    b. Whole nuts, grains, and seeds with plenty of B vitamins
    c. Whole grain bread that wasn't fortified with iron

Anemia in the Early 1900's

1. Anemia received a great deal of attention from researchers during the early 1900's.
    a. They had very effective diets to treat it.
    b. They eventually were able to isolate and then quantify individual minerals and nutrients, to understand what actually caused anemia nutritionally.
    c. A lot of this work was done in animals, with nutrient deprivation studies.
2. Things have changed...
    a. Diets continued to change and get more and more extreme.
    b. Scientists lost interest in the humble disease of anemia, and got caught up in making lots of money pushing big pharma drugs and authoring big pharma studies.

Big Changes, Big Problems

1. The Green Revolution
    a. New toxins.
    b. Mineral-depletion of the soils.
2. Animal factory farming
    a. People stopped eating the whole animal gradually.
    b. Lack of micronutrients for animals.
3. The “fat is bad” lie
    a. Vitamin A rich foods were abandoned.
4. Minerals in our water
    a. Fluoridation and chlorination.

How do we differentiate anemias?

1. Many anemias can masquerade as iron deficiency anemia.
    a. Why?
2. Copper and vitamin A are necessary for iron mobilization.
    a. Low copper and low vitamin A can each look like iron deficiency.
    b. Blood iron levels will be low.
    c. Total body iron may be entirely normal or HIGH.
3. B-6, B-12, and folate deficiency are all necessary for red blood cell production.
    a. Low functional stores of these vitamins often go undiagnosed due to outdated methods.
    b. Laboratory standards are misguided, leading to under-diagnosis.
    c. These deficiencies often occur with and compound effects due to low copper and vitamin A.
4. How do we know when it isn't just "iron deficiency anemia?"

Look at the Blood, Urine, and Hair

1. Measure functional pathways
    a. Urinary methylmalonic acid - NOT B-12 level
    b. Ceruloplasmin (blood) - NOT JUST a copper level
2. Measure absolute levels
    a. Adequate vs inadequate stores and supplies
    b. Compare ratios of functional markers and absolute markers
    c. Copper/ceruloplasmin ratio
    d. Methylmalonic acid/creatinine ratio

Vitamin A and Anemia

1. Vitamin A = a family of fat-soluble vitamins with a multitude of health effects.
    a. Circadian rhythms, immunity - it's as important as vitamin D.
2. Without vitamin A:
    a. Mucosal surfaces (mouth, GI tract, GU tract, eyes) fall apart.
    b. Vision deteriorates.
    c. Immunity wanes.
        i. Most measles death may be entirely attributable to vitamin A deficiency or insufficiency.
    d. Hemoglobin and therefore red blood cells cannot be made properly.

Vitamin A and Anemia

1. What is vitamin A found in?
    a. Full-fat dairy
    b. Cod liver oil
    c. Animal livers
    d. Can be derived from beta-carotene in fruits and vegetables
2. Who tends to get deficiencies?
    a. People who don't eat the above regularly
    b. People with gallbladder/liver problems due to malabsorption

Vitamin A and Anemia

1. How does vitamin A facilitate red blood cell and hemoglobin formation?
    a. Facilitates the movement of iron around the body, into and out of cells, and into hemoglobin.
    b. Without vitamin A, red blood cells cannot be produced.
    c. Iron can still accumulate in the body.
2. Supplementing iron in vitamin A deficiency is not the answer.
    a. Misdiagnosis can contribute to gradual iron-overload and diseases thereof.

Copper and Anemia

1. Copper is an essential mineral.
    a. Involved in tens of thousands of reactions within the body.
2. Without copper:
    a. You cannot create energy.
    b. You cannot neutralize reactive oxygen species.
    c. You cannot eliminate toxins.
    d. You cannot move iron around the body or make new red blood cells.

Copper and Anemia

1. What is copper found in?
    a. The livers of grazing animals - beef, bison, lamb, goats, and other ungulates.
    b. Nuts and seeds.
    c. Shellfish.
2. Who tends to get copper deficiency?
    a. Men
    b. People with stomach/GI problems
    c. People with toxic exposures (lead, mercury), particularly fake hormones
    d. Women under too much stress (exercise) or who are on an extreme diet

Copper and Anemia

1. How does copper facilitate red blood cell and hemoglobin formation?
    a. Facilitates the movement of iron around the body, into and out of cells, and into hemoglobin.
    b. Without copper, red blood cells cannot be produced.
    c. Iron can still accumulate in the body.
2. Supplementing iron in copper deficiency is not the answer.
    a. Misdiagnosis can contribute to gradual iron-overload and diseases thereof.

Iron, Copper, and Vitamin A

1. Without proper vitamin A and copper utilization, you cannot properly metabolize iron.
    a. You may wind up with iron overload.
2. How often are vitamin A deficiency and copper deficiency misdiagnosed as iron deficiency anemia?
    a. And therefore treated inappropriately?
    b. I have been unable to locate a definitive study looking at this.
    c. Testing in my practice suggests this is a common problem.

Folate and B-12

1. Folate and B-12 deficiency are both common and have similar clinical presentations.
    a. Similar organic acid abnormalities are found in laboratory testing.
    b. In extreme cases, they present as a triad of anemia, leukopenia, and neuropathy.
    c. Which is also true of copper deficiency.
2. How many cases of B-12 and folate deficiency are truly of copper deficiency?
    a. Goodman, B. P., Chong, B. W., Patel, A. C., Fletcher, G. P., & Smith, B. E. (2006). Copper deficiency myeloneuropathy resembling B12 deficiency: partial resolution of MR imaging findings with copper supplementation. American journal of neuroradiology, 27(10), 2112-2114.
3. How many patients diagnosed as iron deficiency anemia, B-12 deficiency anemia, or folate deficiency anemia are truly copper and/or vitamin A deficient?
    a. Beef liver contains all three of these nutrients in abundance.

What about B-6?

1. Vitamin B-6, or pyridoxine, is essential for normal hemoglobin and red blood cell production.
2. Deficiency also presents with neuropathy, neutropenia, and anemia.
    a. Dermatitis and psychiatric illness may also be prominent.
3. Serum levels are unreliable.
4. Organic acid testing of kynurenic, xanthurenic, and quinolinic acid are best.
5. This is commonly missed.

Back to Iron...

1. What happens when we treat anemia with iron?
2. Do we really need to use iron as a pill or infusion when practically every food we can eat contains an abundance of iron?
3. Iron is far from harmless.
4. Who does iron harm and how much harm does it do?

Iron Overload

1. What exactly is iron overload?
2. "Ferritin levels are a continuum and susceptibility to iron toxicity thus may commence at ferritin levels mistakenly considered to be within the “reference range” used commonly."
    a. - Leo Zacharski, MD
3. Extreme iron overload is uniformly fatal.
    a. We see this in a genetic disease called hemochromatosis.

Cardiovascular Disease

1. "Dr. Jerome Sullivan, a pathologist, first theorized that men had higher rates of heart disease than women because they have more iron in their bodies."
    a. PD Mangan, Dumping Iron
2. Oxidative stress generated by iron oxidizes lipid particles
3. Lipid particles, when oxidized, can adhere to blood vessel walls
4. We call these atherosclerotic plaques
    a. Sullivan, JeromeL. "Iron and the sex difference in heart disease risk." The lancet 317, no. 8233 (1981): 1293-1294.
    b. Holsworth Jr, R. E., Y. I. Cho, J. J. Weidman, G. D. Sloop, and JA St Cyr. "Cardiovascular benefits of phlebotomy: relationship to changes in hemorheological variables." Perfusion 29, no. 2 (2014): 102-116.
5. Phlebotomy improves many parameters of blood, parameters that are associated with risk of heart attack.

Cardiovascular Disease

1. The Kuopio Ischaemic Heart Disease Risk Factor Study
2. A cohort of 2, 862 men aged 42–60 years were followed for an average of almost 9 years.
3. One man (0.7%) out of 153 men who had donated blood in 24 months preceding the baseline examination experienced an acute myocardial infarction during 1984 to 1995, whereas 316 men (12.5%) of 2,529 non-blood donors had an acute myocardial infarction ($p < 0.0001$ for difference between proportions).
4. **...blood donors had a 88% reduced risk (relative hazard = 0.12, 95% confidence interval 0.02–0.86, p = 0.035) of acute myocardial infarction, compared with non-blood donors.**
    a. Salonen, J. T., Tuomainen, T. P., Salonen, R., Lakka, T. A., & Nyyssonen, K. (1998). Donation of blood is associated with reduced risk of myocardial infarction: the Kuopio Ischaemic Heart Disease Risk Factor Study. American journal of epidemiology, 148(5), 445-451.

Type 2 Diabetes

1. Iron generates oxidative stress within cells
2. Chronic nutrient wasting
3. Excessive oxidative stress breaks down normal metabolic machinery
4. This can result in glucose intolerance, resulting in insulin insensitivity and diabetes

a. Valenti, Luca, Anna Ludovica Fracanzani, Paola Dongiovanni, Elisabetta Bugianesi, Giulio Marchesini, Paola Manzini, Ester Vanni, and Silvia Fargion. "Iron depletion by phlebotomy improves insulin resistance in patients with nonalcoholic fatty liver disease and hyperferritinemia: evidence from a case-control study." American Journal of Gastroenterology 102, no. 6 (2007): 1251-1258.

b. Houschyar, Khosrow S., Rainer Lüdtke, Gustav J. Dobos, Ulrich Kalus, Martina Broecker-Preuss, Thomas Rampp, Benno Brinkhaus, and Andreas Michalsen. "Effects of phlebotomy-induced reduction of body iron stores on metabolic syndrome: results from a randomized clinical trial." BMC medicine 10, no. 1 (2012): 1-8.

Type 2 Diabetes and Metabolic Syndrome

1. "Blood donation is simultaneously associated with increased insulin sensitivity and decreased iron stores."
    i. Paul Mangan, PhD, “Dumping Iron”
2. Non-Alcoholic Fatty Liver Disease
    a. "The liver is a principal target for iron toxicity because it is chiefly responsible for taking up and storing excessive amounts of iron." - Bonkovsky and Lambrecht, 2000.
    b. "An important mechanism implicated in alcohol-related hepatocarcinogenesis in oxidative stress from alcohol metabolism, inflammation, and increased iron storage." Seitz and Stickel, 2006.

Liver Disease

1. Diets that predispose to liver disease are low in the iron-controlling factors vitamin A and copper, and rich in iron.
2. The liver-destroying diet:
    a. Refined flours.
    b. Alcohol and simple sugars.
    c. Skeletal muscle meats only.
    d. Avoid full-fat dairy.
    e. Avoid nuts and seeds.
    f. Avoid fruits and vegetables.
    g. Avoid fish and shellfish.

Arthritis and Osteoporosis

1. Arthritis and osteoporosis
   a. One of the primary symptoms in hereditary hemochromatosis
   b. Free radicals = inflammation = pain
   c. How much arthritis is due to iron overload?
   d. Patients with hereditary hemochromatosis will develop osteoporosis prematurely, unless treated
2. Blood-letting in hemochromatosis is an effective treatment for arthritis symptoms
   a. Askari, A. D., Muir, W. A., Rosner, I. A., Moskowitz, R. W., McLaren, G. D., & Braun, W. E. (1983). Arthritis of hemochromatosis: clinical spectrum, relation to histocompatibility antigens, and effectiveness of early phlebotomy. The American journal of medicine, 75(6), 957-965.

Gout

1. Gout may be relieved by blood-letting
    a. Facchini, F. S. (2003). Near-iron deficiency-induced remission of gouty arthritis. Rheumatology, 42(12), 1550-1555.
2. Gout is closely related to insulin resistance, liver disease, and other aspects of metabolic syndrome.
3. How do you get gout?
    a. Follow the liver-toxic diet outlined before.
    b. Don’t drink enough water either.

Neuropsychiatric Illness

1. Parkinson's Disease
    a. A 1988 study showed a 176% increase in total iron and 255% increase in ferric iron within the substantia nigra (post-mortem exams)
2. Multiple sclerosis
    a. 1982, iron deposits in the plaques surrounding nerves in MS
3. Alzheimer's disease
    a. 1991, iron found beside senile plaques in Alzheimer's
    b. Dwyer, Barney E., Leo R. Zacharski, Dominic J. Balestra, Alan J. Lerner, George Perry, Xiongwei Zhu, and Mark A. Smith. "Getting the iron out: phlebotomy for Alzheimer's disease?." Medical hypotheses 72, no. 5 (2009): 504-509.
    c. Could blood letting prevent Alzheimers?
4. Hemochromatosis has neuropsychological symptoms
    a. Is this causation?

Neuropsychiatric Illness

1. "Shoham and Youdim (2004) have demonstrated that nutritional iron deprivation can alleviate chemically-induced neurodegeneration in rats."
2. "Iron overload can initiate neurological degeneration in laboratory animals (Jiang et al, 2007)."
3. "every study that has examined iron levels in neurons associated with each respective [neurodegenerative] disease has found increased levels when compared to normal brains."
    a. Jym Moon, Iron: The Most Toxic Element
4. What if iron overload is contributing to epidemics of Autism, ADHD, and other childhood neurodevelopmental disorders?
5. How do iron and aluminum interact to poison the brain?

Cancer

1. "iron participates in the initiation and promotional phases of cancer development."
2. "Iron activates xenobiotics (foreign chemicals), turning them into carcinogens"
3. "Dietary iron acts directly to cause liver cancer."
    a. Jym Moon, Iron: The Most Toxic Element
4. "An important mechanism implicated in alcohol-related hepatocarcinogenesis in oxidative stress from alcohol metabolism, inflammation, and increased iron storage."
    a. Seitz and Stickel, 2006.
5. Iron is a known carcinogen.

Cancer

1. Lung cancer
    a. Inhalation of iron filings/dust predisposes to lung cancer
    b. Asbestos contains iron - is this why it is so carcinogenic?
2. Breast cancer
    a. Breast cancer cells contain high concentrations of iron
3. Liver cancer
    a. Associated with hereditary hemochromatosis

Cancer

1. Iron sensitizes tissues to ionizing radiation
    a. Ionizing radiation from x-rays is more toxic in those who are overloaded with iron
    b. This would potentiate its carcinogenic potential
2. Skin cancer
    a. Could iron overload contribute to skin cancer?
    b. Since we started iron-fortifying our food supply, skin cancer rates have risen
    c. As time spent outside has plummeted...
    d. If the sun causes skin cancer, then spoons make people fat!
    e. "the skin-aging effects of sunshine are generated by a mechanism that requires iron."
        i. Jym Moon, PhD, Iron: The Most Toxic Element, page 101

Cancer

1. "Iron acts synergistically with viral infections in causing cancer."
2. Do we need cancer vaccines?
3. Or do we need to stop fortifying our food with iron and start eating foods that optimize iron metabolism?
4. EBV? CMV? Chronic Lyme?
    a. Look for iron overload.
    b. This is in the blindspot of most practitioners who are treating these diagnoses.

Infertility

1. You are the carbon they want to reduce…
2. “Two generations to flatten the population curve…”
3. Infertility and Impotence
    a. Hemochromatosis results in impotence and infertility
    b. Low testosterone levels
    c. Iron poisons their endocrine organs, resulting in loss of hormone production
    d. Since we started fortifying our food with iron, we have seen the rise of epidemics of impotence, low testosterone levels, low sperm quality and count, and infertility.
    e. Coincidence or causation?

Iron Overload Symptoms

1. Overwhelming infection
    a. Iron withholding is a defense mechanism
    b. Your body deprives microbes of iron to starve them to death
    c. When iron levels reach a certain level, the body struggles to control them
    d. This creates a vulnerability to infection
2. Elevated iron levels are a poor prognostic factor in infections
3. Diseases of immunocompromise all keep company with iron overload
    a. Diabetes
    b. Dementia
    c. Metabolic syndrome
    d. Is iron poisoning our immune systems?
    e. The dose makes the poison.

Pottenger's Cats

1. The rates of every disease associated with iron overload is rising.
2. These diseases are also associated with deficiencies of many nutrients.
3. As time goes on and nutritional deficiencies and toxic load worsens, the population as a whole gets sicker.
4. He found that nutritional deficiencies had radical effects on feline behavior, growth, and health that compounded over generations.
5. We are now two or three decades past the Green Revolution
    a. Kids have been raised on fake light, fake food, and fake news
    b. They have never been sicker
    c. Iron is contributing to this problem

What about energy?

1. $E = mc^2$
2. What about the energy side of the equation?
3. Light
4. Sound
5. EMF
6. Not to mention…
7. Water

What about light?

1. Light has been studied in the treatment of anemia
    a. Strong light does seem to stimulate the production of red blood cells
2. Every nutrient involved in red blood cell and hemoglobin production is photo-sensitive
    a. They often have a distinctive color
    b. I believe light modulates all of these reactions

What about EMF?

1. Microwave and radiowaves
    a. What happens when you stick a fork in a microwave?
    b. What happens to someone who is iron-overloaded in a world loaded with radio and microwave radiation from cell phones, wifi routers, bluetooth devices, and smart meters?
    c. Your cell is LOADED with minerals
2. Is the roll out of 5G the real reason we saw a spike in mortality in 2020?
    a. These are interesting questions that get you censored when you ask them in most forums

What can we do to protect ourselves from iron overload?

1. Let's discuss the perils and pitfalls of testing.
2. Blood levels of iron do NOT reflect total body iron.
    a. Is anyone out there in the modern world truly iron-deficient in body?
    b. Half of the iron we consume is from fortified foods.
    c. We eat a high iron diet - lots of meat, fish, shellfish, and high-iron vegetables like spinach.
3. Most practitioners do not understand iron dynamics, or perform adequate testing.

What can we do to protect ourselves from iron overload?

1. What do blood iron levels reflect?
    a. Recent ingestion.
    b. Recent transfusion or infusion.
    c. Mobilization of iron from body stores.
    d. Low iron may simply reflect inadequate copper and vitamin A.
2. How do you know if you don't test?
    a. Vitamins
    b. Minerals

Blood iron levels

1. Elevated levels of iron in the blood suggest total body iron overload.
    a. I recommend phlebotomy to my patients who have iron overload.
    b. This means a ferritin that is over 75 ng/ml
    c. In the Copenhagen City Heart Study, "The death rate increased from 10 to 15% (depending on cause of death) for every 100-point increase in ferritin."
    d. So long as patients are robust and do not have other nutritional deficiencies that may be worsened by blood donation
    e. I also avoid in cases of low blood pressure or abnormal heart rhythms

Blood iron testing continued…

1. Depends on acuity and severity of the case.
    a. Generally, every three to six months.
    b. I check iron stores, zinc, copper, blood counts, and high sensitivity CRP.
    c. I may check organic acids to evaluate for B vitamin function.
2. How often do I recommend phlebotomy?
    a. This depends upon blood pressure, blood counts, iron levels in the blood, and constitution of the patient
3. I get HFE gene analysis in many patients
    a. Most at risk are those of Northern European Ancestry
    b. The Celtic Curse
    c. Approximately 0.5% of North Americans have double mutations.
    d. Approximately 10% are carriers.
    e. That means that more than 10% of the population is at risk of iron overload.

B-vitamin testing

1. Is not usually worth the money that is spent upon it, because doctors are ordering the wrong test.
2. Testing levels of B vitamins in your blood is like asking how many tools someone has in their toolbox.
    a. Having lots of hammers is pointless when the job calls for a screwdriver.
    b. B vitamins that are not properly methylated often cannot be used by the body.
    c. The unphosphorylated form of B6 can actually compete with the phosphorylated form to cause B6 deficiency!
    d. Taking the wrong form of a vitamin can cause the disease you are trying to cure!
    e. This is true for B-12 and folate as well.
3. What should you test?
    a. There are a variety of markers that I use on organic acid testing.

Iron-fortified foods and supplements

1. I avoid iron fortified foods as possible
    a. In 1995, Sweden stopped fortifying food with iron.
    b. They had found that the risks of iron fortification to those who have a genetic tendency to iron overload out-weighed the benefits of iron fortification.
2. This means obtaining flour from millers who will not fortify it
    a. Or milling it yourself
3. Iron-containing multivitamins
    a. I recommend against them across the board
4. Did you know there is virtually no iron in human breast milk?
    a. Why would you fortify infant formula with iron?
    b. You would only do that if you were arrogant enough to think that nature makes mistakes.
    c. Did you know that higher levels of iron are found in the livers of babies who died of sudden infant death syndrome?
    d. What do you think we would find if we examined these babies for other toxic metals, like aluminum?

What about dietary supplements?

1. Whole foods always trump dietary supplements.
    a. You cannot out-supplement a poor diet.
2. Fake vitamin A may be more of a liability than an asset.
    a. Vitamin A is very tricky.
    b. It's really a family of compounds that are all light-sensitive.
    c. Given that you can easily get therapeutic doses from multiple food sources, should you really supplement?
    d. There are cases where I think this is indicated, but they are highly contextual.
3. Copper, iron, zinc, molybdenum, and manganese.
    a. All of these metals can accumulate to toxic levels.
    b. Zinc, manganese, and molybdenum can all suppress copper levels and cause copper deficiency.
    c. Copper can reach excessive levels and cause many of the same symptoms of iron overload.

Vitamins C, E, and Phytonutrients

1. The main problem with iron is its contribution to oxidative stress within the body.
2. What are nature's remedies to oxidative stress?
    a. Vitamins C, E, and antioxidants
    b. Sulfur containing foods that boost glutathione
3. Where do we get these?
    a. Fresh fruits and vegetables
    b. Whole nuts and seeds

Water

1. People like hard water
    a. Rich in minerals like copper and magnesium
2. They don't like iron-rich water
    a. Sometimes they ignore it and just keep drinking it…
    b. This doesn't end well
3. Make sure your water is re-mineralized with the proper minerals
    a. And is free of toxic iron

Case #1

1. 39-year-old male, European descent
2. Ferritin = 355 and 358, six months apart
3. Elevated bilirubin and liver function tests
4. Elevated homocysteine (9.4 umol/l)
5. Total Testosterone = 550-816 ng/dl
6. Zinc = 75 mcg/dl
7. Copper = 87 mcg/dl
8. Mercury = 14 mcg/dl
    a. Normal = 5 or so

Case #1

1. Normal blood markers otherwise
2. Complaining of:
    a. Fatigue
    b. Abdominal pain and bloating
    c. Brain fog
3. What did we do?

Case #1

1. Donated blood
2. Immediate improvement in energy
3. Gradual improvement in GI complaints
4. Immediate improvement in brain fog
5. “Game changer”
6. Avoid iron-fortified food and high-mercury fish

Case #2

1. 74-year-old man
2. 150 pounds, 6’3”
3. Still chopping and stacking wood in his backyard
4. Both sons are physicians - ICU and orthopedic surgeon
5. Prior history of stomach surgery
6. Chronic antacid “therapy”
7. 30-year-old anemia, diagnosed Cleveland Clinic
8. Failed testosterone therapy - total T = 200

Case #2

1. Stopped antacids
2. Started a soothing GI cocktail
3. Organic acids testing
4. Blood mineral levels
5. More frequent meals
6. Oats, okra, beans, nuts, seeds, whole grains, greens
7. Pressure-cooked and slow-cooked
8. Protein powders, shakes after a while

Case #2

1. Organic acid testing
    a. B-6 and folate deficiencies
2. Minerals
    a. Copper deficiency
    b. Magnesium deficiency
    c. Zinc deficiency
3. After six months…

Case #2

1. Improved energy
2. Complete resolution of GI complaints
3. Hemoglobin improved from around 8 to above 13
4. Testosterone unchanged
5. Blood minerals and urinary organic acids much improved
6. Gained 20 pounds of lean body mass
7. 170 pounds - nearing his goal weight

Conclusions

1. Iron overload is a common problem due to iron fortification of the food supply and a diet rich in skeletal muscle meats.
2. Modern diets are deficient in the nutrients that control iron metabolism and red blood cell production.
    a. Copper, Vitamin A, B6, B12, and folate.
3. A whole food diet with proper ratios of animal fats provides an abundance of these nutrients.
4. Periodic iron assessment can help us identify those at risk of diseases of iron overload.
5. Blood donation can prevent or at least mitigate diseases of iron overload.

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LELAND STILLMAN, MD

StillmanMD.Substack.com
StillmanMD.com

LELAND STILLMAN, MD

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