Can Magnesium Deficiency Play a Role in AF?

by JEFFREY REDEKOPP

AFib and Magnesium

Magnesium is a mineral found in many common fruits, grains, and vegetables necessary for various functions in the human body. Magnesium helps your body with such physiologic processes, such as managing protein to help build muscle, aiding in regulating blood sugar levels and controlling blood pressure. But what is the relationship between AFib and magnesium?

Magnesium is also involved with transporting calcium and potassium across cell membranes, which is necessary for creating electrical conduction that sustains a normal heart rhythm. Given that magnesium influences heart rhythm because of its physiologic effects on heart cells, this vital element is currently recognized in studies for its potential to treat or even prevent arrhythmias like atrial fibrillation (AF).

Magnesium's Relationship to Atrial Fibrillation

For years, clinicians and medical researchers have studied magnesium's effect on AF. Magnesium can help treat rapidly occurring AF when it happens after surgery. Magnesium is often paired with other heart rate rhythm or control medications to help increase the probability of successfully converting AF into a normal rhythm.

The journal Circulation has articles on several different issues that address this topic:

- A 2013 issue reports that low magnesium levels are a risk factor for developing AF after coronary artery bypass graft surgery. The article also says that some research shows that administering magnesium decreases the risk of AF occurrence.
- A 2016 issue says that available data does not confirm that magnesium use is an effective strategy for preventing AF.
- A 2019 issue states that magnesium may influence the development of AF and that people with genetically higher magnesium levels could have a reduced risk for the disease. However, the article also reports limitations with findings, suggesting that this may not be true in all cases.

Some people with AF question if the arrhythmia is happening because of low magnesium levels.

According to the American Heart Association, people with low magnesium levels could have a higher risk of developing AF. The British Medical Journal supports this position, stating that people with magnesium deficiency are at an increased risk of experiencing cardiovascular events.

Dr. Carolyn Dean, MD and D also shared in a 2012 interview with the Nutritional Magnesium Association that a lack of dietary magnesium plays a large part in atrial fibrillation. The primary reason is that low magnesium levels can disrupt the normal flow of calcium in and out of the heart muscles cells, cause the heart to beat erratically, causing the arrhythmia.

However, there are not enough available studies to conclusively link the onset of AF to low magnesium levels. There is also no clear information suggesting that people should increase their magnesium intake to prevent the potential development of AF.

Signs of Magnesium Deficiency

The magnesium in our bodies exists mainly in our soft tissues and bones. Less than 1% of our magnesium is in our bloodstream. The easiest way to measure magnesium is by running blood tests.

Still, because the percentage in our bloodstream is so tiny, it is not easy to get an accurate idea of our total levels and how much is present in specific tissues. Some other methods for measuring bodily magnesium include conducting saliva and urine tests.

A magnesium deficiency will commonly produce the following symptoms:

- Appetite loss.
- Fatigue.
- Weakness.
- Vomiting.

More severe cases of magnesium deficiency include these warning signs:

- Numbness.
- Tingling.
- Cramps.
- Muscle contractions.
- Seizures.
- Coronary spasm.
- Personality changes.
- Abnormal heart rhythms.
- Abnormally low levels of calcium or potassium.

People who are most at risk for magnesium deficiencies live in impoverished areas where food sources of the mineral are scarce. Older adults also may be prone to reduced levels because of generally lower dietary intake and decreased gut absorption.

Individuals with chronic conditions such as Crohn’s disease, celiac disease, small intestine bypass, type 2 diabetes and chronic alcoholism are also at risk.

Most people do not have to fret about getting too much magnesium because our kidneys will eliminate the excess amount when we urinate. However, suppose you are taking extreme doses of laxatives or antacid-containing magnesium. In that case, you could be at high risk for developing toxic levels that can lead to muscle weakness, cardiac arrest and irreversible kidney damage.

Treating Magnesium Deficiency and People With Atrial Fibrillation

People hospitalized with an acute onset of AF or who developed it after open-heart surgery will sometimes receive IV magnesium to treat and reverse the arrhythmia. When appropriate for use, the dosages and situations will vary based on the individual’s medical condition and clinical guidelines.

Increasing your magnesium intake is necessary for magnesium-deficient people with AF, even without hospitalization with an acute episode. Most of us get enough of this mineral through the foods we eat.
So, if you are diagnosed with magnesium deficiency, set up an appointment with a dietitian to get guidance about foods you should eat more of that will not interfere with the medications you are currently taking. A dietitian can also recommend portion sizes based on your caloric needs.

Some of the foods with high magnesium content are:

- Pumpkin seeds.
- Nuts such as almonds, cashews and peanuts.
- Spinach.
- Broccoli.
- Carrots.
- Black beans.
- Edamame.
- Avocados.
- Potatoes.
- Brown rice.
- Yogurt.
- Oatmeal.
- Salmon.
- Chicken.
- Beef.

If you think you would instead take a magnesium supplement, discuss this with your physician, as they can give you guidance on appropriate frequency and dosage that will not interfere with your other medications. For most people, simply increasing your intake of magnesium-rich foods will return your levels to normal.