CONDITION

Calcium carbonate with magnesium overdose

Learn how taking too much calcium carbonate with magnesium can affect the stomach, kidneys, heart, and nervous system, and when to seek urgent help.

WHAT IT IS
Toxicity from excess calcium carbonate with magnesium

BODY SYSTEM
Digestive, kidneys, heart and circulation, nervous system

MAIN SYMPTOMS
Nausea, vomiting, muscle weakness, confusion

WHAT CAUSES IT
Excessive calcium carbonate and magnesium intake

HOW IT IS DIAGNOSED
Blood calcium and magnesium tests

MAIN TREATMENT
Supportive care and mineral level correction

CAN IT BE CURED?
Yes, with prompt treatment and monitoring

IS IT AN EMERGENCY?
Sometimes, if breathing is difficult

LONG-TERM OUTLOOK
Usually good with prompt advice and monitoring

Overview

Calcium carbonate with magnesium is found in some antacids and dietary supplements. Calcium carbonate neutralizes stomach acid. The magnesium ingredient may be magnesium hydroxide, magnesium carbonate, or another magnesium salt, depending on the product.

An overdose happens when someone takes more than the product label recommends. It can occur after one large dose or from taking excessive amounts repeatedly over days, weeks, or longer. A person may also unintentionally take too much by combining several antacids, calcium supplements, magnesium products, or multivitamins.

The effects depend on the exact ingredients, how much was taken, whether the exposure was brief or repeated, and how well the kidneys are working. Healthy kidneys remove excess magnesium and help control calcium levels. Kidney disease, dehydration, and certain

medicines can make serious effects more likely.

Too much calcium carbonate may raise the calcium level in the blood. When this occurs along with reduced kidney function and a blood chemistry change called metabolic alkalosis, it is known as calcium-alkali syndrome . Metabolic alkalosis means the blood has become more alkaline than normal.

Too much magnesium can also build up in the blood, especially when kidney function is reduced. High magnesium levels may affect muscle strength, blood pressure, breathing, and heart rhythm.

If someone may have taken more than directed, contact a poison center promptly rather than waiting for symptoms. In the United States, call Poison Help at 1-800-222-1222 . Outside the United States, contact the local poison center or emergency service. If the exposure was intentional, urgent medical and mental health support is needed.

Symptoms

Symptoms can vary widely. A person may initially have no symptoms, particularly after a modest one-time exposure. Problems from repeated overuse may develop gradually and be mistaken for another illness.

Effects on the digestive system may include:

A high blood calcium level, called hypercalcemia , may cause increased thirst, frequent urination, constipation, fatigue, muscle weakness, headache, or difficulty concentrating. More severe elevations can cause confusion, unusual sleepiness, dehydration, or an abnormal heart rhythm.

A high blood magnesium level, called hypermagnesemia , can cause nausea, flushing, weakness, reduced reflexes, low blood pressure, or drowsiness. At very high levels, breathing may become slow, the heartbeat may become unusually slow or irregular, and the person may become difficult to wake.

Kidney problems may lead to reduced urination, swelling, worsening weakness, or abnormal laboratory results. However, acute kidney injury does not always cause obvious symptoms.

Call emergency services immediately if the person collapses, has a seizure, has severe confusion, cannot be awakened, has trouble breathing, or develops signs of a serious heart problem such as fainting or severe chest discomfort. Do not delay emergency care while trying to calculate the dose.

- Nausea, vomiting, or loss of appetite

- Abdominal discomfort or bloating
- Constipation, which is more common with calcium
- Diarrhea, which is more common with some magnesium salts
- An unpleasant or chalky taste

Causes and risk factors

The most direct cause is taking more calcium carbonate with magnesium than the label recommends. This may happen because symptoms such as heartburn do not improve, doses are taken too close together, or more than one product contains the same minerals.

Chronic overuse can be particularly important. Someone may take an antacid several times each day while also using calcium for bone health or magnesium for constipation. The total amount from all products may be much higher than expected.

Factors that may increase the chance of harmful effects include:

Thiazide diuretics like furosemide or hydrochlorothiazide , which are used for high blood pressure, can reduce calcium loss in the urine. Vitamin D can increase calcium absorption. These do not automatically make calcium carbonate unsafe, but they are important for clinicians and poison specialists to know about after a possible overdose.

People with heart disease or those taking medicines that affect heart rhythm may need closer assessment if calcium or magnesium levels are abnormal. The product package, prescription list, and all supplement containers can help identify relevant ingredients.

- Chronic kidney disease or a sudden decline in kidney function
- Dehydration from vomiting, diarrhea, fever, or poor fluid intake
- Older age, especially when kidney function is reduced
- Taking multiple calcium-, magnesium-, or vitamin D-containing products
- Frequent use of calcium carbonate for ongoing indigestion or heartburn
- Medicines that affect calcium balance or kidney function
- A history of high blood calcium or certain hormone disorders
- Accidental ingestion by a child

Diagnosis

A possible overdose is assessed from the product, estimated amount, timing, symptoms, and medical history. The label matters because different products contain different calcium and magnesium compounds and strengths. Clinicians may ask about other antacids, laxatives, vitamins, supplements, and prescription medicines.

If safe to do so, have the package available when speaking with a poison specialist or clinician. Do not delay emergency care to search for it.

Blood tests may measure:

Ionized calcium is the biologically active form of calcium. It may help clarify whether the active calcium level is high when total calcium is difficult to interpret.

An electrocardiogram, or ECG, records the heart's electrical activity. It may be used when the person has significant symptoms or abnormal calcium, magnesium, or potassium levels. Blood pressure, breathing, mental alertness, urine output, and reflexes may also be monitored.

In an emergency department, clinicians may test for other substances if the product or amount is uncertain. They may also look for another reason for high calcium, high magnesium, or kidney dysfunction rather than assuming the antacid is the only cause.

- Total and ionized calcium
- Magnesium
- Kidney function, including creatinine
- Electrolytes such as sodium, potassium, chloride, and phosphate
- Bicarbonate, which helps identify metabolic alkalosis
- Albumin, a blood protein that affects the interpretation of total calcium

Treatment and management

Treatment depends on the ingredients, amount, symptoms, laboratory findings, and kidney function. A poison center can often help decide whether home observation is reasonable or whether medical evaluation is needed.

Do not induce vomiting. Do not take additional medicines, supplements, or home remedies to "balance" the minerals unless a poison specialist or clinician instructs you to do so. Drinking very large amounts of water is not appropriate for everyone, particularly people with kidney or heart disease.

Medical care may begin by stopping the calcium- and magnesium-containing product. Clinicians may also temporarily hold other contributing medicines after considering why they

were prescribed. Patients should not stop an important prescription medicine on their own.

In a healthcare setting, treatment may include intravenous fluids to correct dehydration and help the kidneys remove excess calcium and magnesium. Fluid treatment must be adjusted carefully for people with heart or kidney disease.

For serious hypermagnesemia, intravenous calcium may be used to oppose magnesium's effects on the heart and muscles. This does not immediately remove magnesium from the body. Other treatment may help the kidneys excrete magnesium when kidney function is adequate.

Severe hypercalcemia may require medicines that lower calcium or limit its effects. The best option depends on the cause. Calcium-alkali syndrome often improves after the calcium and alkali source is stopped and dehydration is corrected, but laboratory monitoring remains important.

Dialysis may be considered when toxicity is severe, kidney function is poor, or dangerous calcium or magnesium abnormalities do not respond to other treatment. Dialysis filters waste and excess minerals from the blood.

Activated charcoal does not bind calcium or magnesium well and is generally not useful for an isolated mineral antacid overdose. Decisions about gastrointestinal decontamination should be made by toxicology or emergency specialists rather than attempted at home.

Complications

Most limited exposures can be managed successfully with prompt advice and appropriate monitoring. The chance of complications rises with large ingestions, repeated excessive use, delayed care, dehydration, or reduced kidney function.

Possible complications include:

Changes in calcium, magnesium, potassium, and fluid balance can occur together. Treatment therefore requires repeat testing rather than focusing on a single laboratory result.

After the excess minerals are stopped and treated, levels can sometimes fall below normal, especially after intensive treatment. Clinicians may continue monitoring until kidney function, symptoms, and electrolyte levels are stable.

- Acute kidney injury
- Calcium-alkali syndrome
- Severe dehydration

- Low blood pressure
- Abnormal or dangerously slow heart rhythms
- Marked muscle weakness or loss of normal reflexes
- Slow or inadequate breathing
- Confusion, reduced consciousness, or coma
- Calcium deposits in kidney tissue after prolonged severe hypercalcemia

Follow up

Follow-up depends on the severity of the exposure. A poison center may recommend home observation for a low-risk exposure, while a clinician may arrange repeat blood tests after significant symptoms, abnormal laboratory results, or kidney injury.

Routine follow-up may include checking calcium, magnesium, kidney function, and other electrolytes. A clinician may also review every prescription medicine, over-the-counter product, vitamin, and supplement to identify overlapping ingredients.

Ongoing heartburn should not be managed by repeatedly exceeding an antacid label. Frequent symptoms may need a separate evaluation to look for acid reflux, an ulcer, medication effects, or another cause. A clinician or pharmacist can help select a safer long-term plan based on the person's health and other medicines.

Seek urgent reassessment for worsening vomiting, marked weakness, confusion, fainting, reduced urination, or new palpitations. Call emergency services for breathing difficulty, collapse, seizure, inability to wake, or severe chest symptoms.

Store antacids and supplements out of children's sight and reach. Keep products in their original containers so the ingredients and strength remain available if an exposure occurs.

Sources