Magnesium

GENERAL INFORMATION:

What is it?

Magnesium is a mineral found in the body that can be measured with a blood test. Blood tests are often done when you have a routine physical examination. Magnesium is especially important to muscles and nerves. It also helps some enzymes work. An enzyme is something that helps speed up a chemical reaction in your body.

Why do I need it?

You may need a magnesium blood test if you have unexplained muscle cramps, twitching, tremors, seizures, or an irregular heartbeat. People who cannot digest their food properly also may have low magnesium levels. Diuretics, sometimes called water pills, also can cause decreased magnesium levels. Laxatives and antacids can cause increased levels of magnesium.

How do I get ready for the test?

Your caregiver will tell you when to have your blood test done. The blood test may be done before or after eating.

Magnesium Test Procedures

Container

Red-top tube or gel-barrier tube

Collection

Separate serum from cells within 45 minutes of collection.

Storage Instructions

Maintain specimen at room temperature.

Use

Magnesium deficiency produces neuromuscular disorders. It may cause weakness, tremors, tetany (a condition of physiological calcium imbalance), and convulsions.
Hypomagnesemia is associated with hypocalcemia, hypokalemia, long-term hyperalimentation, intravenous therapy, diabetes mellitus, especially during treatment of ketoacidosis; alcoholism and other types of malnutrition; malabsorption; hyperparathyroidism; dialysis; pregnancy; and hyperaldosteronism. Renal loss of magnesium occurs with cis-platinum therapy also adds amphotericin toxicity to the causes of hypomagnesemia.

Magnesium deficiency is described with cardiac arrhythmias. The concept that magnesium deficiency may cause arrhythmias is repeatedly expressed.

Increased magnesium levels relate mostly to patients in renal failure. Marked increases may be found in such patients who take magnesium salts (eg, as antacids which contain magnesium). Increased serum magnesium is also found with Addison disease and in pregnant patients with severe pre-eclampsia or eclampsia who are receiving magnesium sulfate as an anticonvulsant. Hypomagnesemia may occur in patients using magnesium-containing cathartics. High magnesium levels are manifested by decreased reflexes, somnolence, and heart block.

Indications for measurement of serum magnesium include the presence of unexplained hypocalcemia, instances in which hypokalemia is unresponsive to potassium supplementation, and in patients who have cardiac disorders in which hypomagnesemia may be especially hazardous such as congestive failure, ventricular ectopy, digitalis use, or left ventricular hypertrophy. Serum magnesium is indicated only selectively in patients on diuretics: those on high dose thiazides, loop diuretics or hydrochlorothiazide in doses >50 mg/day.

Because an association between aminoglycoside therapy and severe

hypomagnesemia is described, a recommendation is published to measure serum magnesium in subjects receiving aminoglycosides. Recommendations also exist to measure it in patients on cyclosporine.

Limitations

Hemolysis will yield elevated results as levels in erythrocytes are two to three times higher than serum. Bilirubin may cause falsely low values.

Methodology

Colorimetric

Additional Information

Parathormone enhances tubular reabsorption of magnesium. Measuring magnesium in patients with hypocalcemia, of whom 23%, without renal failure, were found in one study to have hypomagnesemia. Magnesium containing drugs can cause toxic levels in patients with impaired renal function. A causal relation between decreased Mg content of cardiac muscle/coronary arteries and non-occlusive sudden-death ischemic heart disease has been proposed. Serum magnesium constitutes only a small fraction of total body stores and may not predict magnesium status correctly. Magnesium acts as a metallic cofactor in over 300 enzymatic reactions. A positive correlation between normomagnesemia and successful resuscitation is reported. Serum magnesium has prognostic importance in congestive heart failure.

Normal Results

1.8 to 3.0 mg/dL. Normal value ranges may vary slightly among different laboratories.

What Abnormal Results Mean

High magnesium levels may be seen in persons who have:

Addison's disease

Chronic renal failure

Dehydration
Diabetic acidosis
Oliguria

Low magnesium levels may be seen in persons who have:

Alcoholism
Chronic diarrhea
Delirium tremens
Hemodialysis
Hepatic (liver) cirrhosis
Hyperaldosteronism
Hypoparathyroidism
Pancreatitis
Too much insulin
Toxemia of pregnancy
Ulcerative colitis