Hypermagnesemia

Hypermagnesemia occurs when the serum level of magnesium exceeds 2.5 mEq/L. This is caused by excess magnesium intake and renal insufficiency. Pregnant women receiving magnesium sulfate to manage symptoms of eclampsia are also at risk. Magnesium is an intracellular cation used to activate enzymatic reactions and maintain normal calcium and potassium balance. Symptoms of hypermagnesemia include flushing, lethargy, muscle weakness, and decreased deep tendon reflexes. The patient may also present with decreased respirations, bradycardia, and hypotension. Interventions to address hypermagnesemia include administering IV calcium gluconate and diuretics. Patients who are renally impaired may require dialysis. Medications containing magnesium, such as certain antacids and laxatives, should be avoided.



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Assessment

Flushing
Flashlight
Magnesium causes vasodilation and increases blood flow in the tissues. Excessive serum levels of magnesium are characterized by increased warmth and flushing as blood circulates faster in the body.

Lethargy
Leather-jacket
Hypermagnesemia decreases neuromuscular and CNS functions leading to lethargy and drowsiness. Mildly elevated serum magnesium levels may lead to nausea and vomiting related to altered CNS functioning.

Muscle Weakness
Weak-drooping-muscle
Patients with hypermagnesemia will experience muscle weakness. Since magnesium is a natural calcium channel blocker, increased levels of magnesium will suppress neuromuscular transmission and lead to muscle weakness.

Decreased Deep Tendon Reflexes (DTRs)
Down-arrow DTR-reflex-hammer
The patient with elevated serum magnesium levels will have decreased deep tendon reflexes (DTR'S). Deep tendon reflexes determines the muscle's ability to stretch while indicating proper functioning of the nervous system. Hypermagnesemia will suppress neuronal impulses and decrease neuromuscular activity, resulting in decreased deep tendon reflexes.

Decreased Respirations
Down-arrow Respirator
Hypermagnesemia may inhibit neuromuscular activity and suppress normal brain functioning. Since the brain is responsible for maintaining breathing, excessive serum levels of magnesium may cause decreased respirations. Monitor the patient's breathing pattern and respiratory rate to assess for neuromuscular impairment.

Bradycardia
Snail-heart
Magnesium functions as a natural calcium channel blocker. Increased levels of serum magnesium will block calcium channels and slow down electrical activity. This action results in decreased heart rate or bradycardia.

Hypotension
Hippo-BP
Magnesium also affects aldosterone levels. Hypermagnesemia will cause hypotension by blocking the calcium channels on the adrenal cortex cells and decreasing aldosterone production. Since aldosterone increases blood pressure, an increase in serum magnesium will cause hypotension.

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Interventions

Dialysis

Dial-machine

The kidneys are responsible for excreting excess amounts of magnesium. Dialysis procedure is responsible for remove excess fluid and waste from the blood. Patients with impaired renal function require dialysis, since they are unable to excrete magnesium.

IV Calcium Gluconate

IV Calcium-cow with Glue-cone

Patients with hypermagnesemia requiring emergency treatment are given IV calcium gluconate or calcium chloride. The administration of calcium will oppose magnesium's effect on muscle contraction and alleviate the symptoms of hypermagnesemia.

Diuretics

Die-rocket

Diuretics, such as IV furosemide, may be used in emergency situations to promote urinary excretion. Increased urinary excretion will also increase magnesium excretion and decrease serum levels. Encourage the patient to increase oral fluids to help excrete magnesium in the urine.

Avoid Antacids and Laxatives containing Mg²⁺

Avoid-sign Ant-acids and Pooping-pill with Magnesium-magazine

Since hypermagnesemia is associated with excessive magnesium intake, instruct the patient to avoid laxatives and antacids containing magnesium. Teach the patient to limit magnesium-containing foods in the diet, such as green leafy vegetables, nuts, bananas, and chocolate.

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