Hypercalcemia (OLD VERSION)

Hypercalcemia is the condition in which a person’s serum calcium level is higher than normal. It can result from increased calcium intake and absorption, shift of calcium from bones into the ECF, and decreased calcium output. Patients display lethargy, hypercoagulation, constipation, pathologic fractures, and possible ECG changes.

PLAY PICMONIC

Assessment

> 10.5 mg/dL Ca2+
Greater than (10) Tin (.5) Hand
Hypercalcemia is defined as a serum calcium level higher than 10.5 mg/dL. Because the normal range is narrow, even slight increases can have severe effects.

Pathologic Fractures
Fractured Bone
In most cases, the excess calcium in the blood was leached from the bones, which weakens them. This can lead to pathologic fractures.

Lethargy
Leather-jacket
Hypercalcemia decreases neuromuscular excitability, with the most common symptom presenting as lethargy. Fatigue, confusion, and a decreased level of consciousness may be observed with severe cases leading to coma.

Hypercoagulation
Hiker-clogs
Hypercoagulation, otherwise known as the formation of blood clots, can occur more easily in states of hypercalcemia. The patient is at increased risk for developing deep vein thrombosis (DVT) of the lower extremities or in areas where venous obstruction occurs.

Constipation
Corked Con-toilet
Hypercalcemia can cause constipation due to decreased peristalsis. Patients may also experience nausea, vomiting, anorexia, and abdominal pain.

ECG Changes
Delta ECG
Hypercalcemia results in EKG changes, which includes a shortened QT interval and shortened ST segment. Cardiovascular changes are the most serious and life-threatening problems of hypercalcemia and should be treated immediately.

QT Shortening
QT-heart Shortened
Hypercalcemia causes increased cardiac contractility, and increased heart rate. This translates into shorter ventricle depolarization and repolarization times, which when viewed on ECG is a shortened QT interval.

Interventions

No Calcium Intake

No Calcium Sign

Interventions for hypercalcemia aim to reduce serum calcium levels thus, no calcium intake should be permitted. This includes stopping IV solutions containing calcium such as Ringer’s lactate and oral drugs containing calcium.

Chelating Drugs

Cleats-on Drugs

Calcium chelating drugs are those that bind to calcium thereby lowering serum levels. Examples include plicamycin (Mithracin) and penicillamine (Cuprimine, Pendramine).

Calcitonin

Cow-throne

Calcitonin is a drug used to inhibit calcium resorption from bone and thereby helps to prevent hypercalcemia.

Lasix Instead of Thiazide Diuretics

Laser overpowering Tarzan Die-rocket

Thiazide diuretics are discontinued and replaced with diuretics that promote the excretion of calcium, such as furosemide (Lasix).

Considerations

Increased Risk for Renal Calculi

Up-arrow Risk of Kidney-boat Cow-captain

As the calcium builds up in the body, crystals can form in the kidneys. Over time, the crystals may combine to form renal calculi or kidney stones.

Increase Fluids

Up-arrow Fluids

Fluid volume replacement can aid in restoring normal serum calcium levels. Fluids should be increased if not contraindicated and may include the infusion of IV normal saline as sodium increases kidney excretion of calcium.