Hypocalcemia Treatments

Hypocalcemia typically occurs as a result of other pathologic processes, so it is important to treat any underlying disorders that exist. Acute treatment begins with IV calcium gluconate, which is cardioprotective. Chronic hyocalcemia treatment includes calcium carbonate, calcium citrate, and oral vitamin D supplements. Finally, patients who are hypomagnesemia should have this electrolyte addressed. This is because hypomagnesemia can lead to decreased PTH secretion, leading to decreased availability of calcium.



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Characteristics

Treat Underlying Disorder

Underlying Diseased-guy

As hypocalcemia is most commonly caused by an underlying condition, treating that condition often resolves the hypocalcemia. This includes correction of magnesium or vitamin D levels with supplementation, correction of nutritional status, correction of acid-base disorder, and treatment of underlying liver or kidney disease.

Acute Treatments

IV Calcium Gluconate

IV Calcium-cow Glue-cones

Patients with severely acute or symptomatic hypocalcemia require emergent treatment to raise calcium levels. Acute drop to below 7.5 mg/dL should be treated, with or without symptoms. Initially, 1-2 g of IV calcium gluconate in dextrose should be infused over 10-20 minutes. Calcium chloride can also be used, however calcium gluconate is preferred because it is less likely to cause tissue necrosis if extravasated. This initial bolus must be followed by a slow infusion of 10% calcium in normal saline or dextrose.

Cardioprotective

Heart-protecting-case

Calcium has a direct effect on cardiac membrane potential and excitability, acting to stabilize the cardiac membrane. This effect can be cardioprotective in cases of impaired neuromuscular transmission and alterations in membrane potential, such as hyperkalemia. On the other side, an excess of calcium can also cause cardiac dysfunction. For this reason, IV calcium must be given slowly due to the risk of serious cardiac dysfunction and arrest with more rapid infusion.

Chronic Treatments

Calcium Carbonate

Calcium-cow with Carbonated milk

Mild or chronic hypocalcemia is defined as a total serum corrected concentration of 7.5-8.0 mg/dL, or an ionized calcium level above 3.0mg/dL, with little to no symptoms. In these cases, oral calcium repletion is preferred. Initially, 1500-2000 mg of elemental calcium given as calcium carbonate or calcium citrate is given daily.

Calcium Citrate

Calcium-cow with Citrus milk

Calcium citrate is a more expensive supplement than calcium carbonate, but it is better tolerated by patients when taken on an empty stomach. Both are equally efficacious as oral medications.

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Vitamin D Supplements

Viking Daisy Pill

Vitamin D is often needed in conjunction with calcium supplementation. Correction of vitamin D deficiency will correct hypocalcemia if it is the sole underlying cause. Treatment consists of 50,000 international units of ergocalciferol (vitamin D2) or calcitriol (vitamin D3) given once per week for six to eight weeks. In the case of impaired vitamin D metabolism (renal or hepatic dysfunction), calcitriol must be used as the body cannot activate the vitamin D precursors itself.

Considerations

Treat Hypomagnesemia

Torn Hippo-magnesium-magazine

Low serum magnesium concentration should be corrected with a total of 2g of magnesium sulfate, infused as a 10% solution over 10-20 minutes. This bolus should be followed by a 1 g/hr maintenance dose. Repletion should be continued until serum magnesium level is corrected to >0.8 mEq/L. Persistent or chronic hypomagnesemia can be treated with a daily dose of 300-400 mg of oral magnesium.

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