

the vitamin D axis as the cause of the hypocalcemia. Nutritional vitamin D deficiency is best assessed by obtaining serum 25-hydroxyvitamin D levels, which reflect vitamin D stores. In the setting of renal insufficiency or suspected vitamin D resistance, serum $1,25(\text{OH})_2\text{D}$ levels are informative.

TREATMENT

Hypocalcemia

The approach to treatment depends on the severity of the hypocalcemia, the rapidity with which it develops, and the accompanying complications (e.g., seizures, laryngospasm). Acute, symptomatic hypocalcemia is initially managed with calcium gluconate, 10 mL 10% wt/vol (90 mg or 2.2 mmol) intravenously, diluted in 50 mL of 5% dextrose or 0.9% sodium chloride, given intravenously over 5 min. Continuing hypocalcemia often requires a constant intravenous infusion (typically 10 ampules of calcium gluconate or 900 mg of calcium in 1 L of 5% dextrose or 0.9% sodium chloride administered over 24 h). Accompanying hypomagnesemia, if present, should be treated with appropriate magnesium supplementation.

Chronic hypocalcemia due to hypoparathyroidism is treated with calcium supplements (1000–1500 mg/d elemental calcium in divided doses) and either vitamin D_2 or D_3 (25,000–100,000 U daily) or calcitriol [$1,25(\text{OH})_2\text{D}$, 0.25–2 $\mu\text{g}/\text{d}$]. Other vitamin D metabolites (dihydroxycholesterol, alfalcidol) are now used less frequently. Importantly, PTH (1-84) (Natpara) is now approved by the Food and Drug Administration for the treatment of refractory hypoparathyroidism, representing an important advance in treatment of these patients. Vitamin D deficiency is best treated using vitamin D supplementation, with the dose depending on the severity of the deficit and the underlying cause. Thus, nutritional vitamin D deficiency generally responds to relatively low doses of vitamin D (50,000 IU, 2–3 times per week for several months), whereas vitamin D deficiency due to malabsorption may require much higher doses (100,000 IU/d or more). The treatment goal is to