

Indiana Medicaid Therapeutics Committee Therapeutic Class Review Summary

Therapeutic Class:
Electrolyte Depleters

Overview:

Hyperphosphatemia is defined as a serum phosphorus level greater than 5.5 mg/dL, usually in the form of inorganic phosphorus. The most common causes of this condition are acute and chronic renal failure. Hyperphosphatemia can be a consequence of decreased filtration rate, increased tubular reabsorption of PO₄, or increased phosphorus load. In addition, elevated serum phosphorus levels are associated with the progression of kidney disease and other consequences such as secondary hyperparathyroidism, renal bone disease, and calcification of soft tissues. Hyperphosphatemia rarely causes symptoms. However, progressive bone weakness can occur, resulting in pain and increased susceptibility to fractures. Calcium and phosphate can crystallize in the walls of the blood vessels and heart causing severe hardening of the arteries leading to strokes, heart attacks, and poor circulation. Crystals can also form in the skin, where they cause severe itching. Hyperphosphatemia among patients with kidney damage is treated by decreasing phosphate intake and reducing the absorption of phosphate from the digestive tract. Electrolyte depleters such as calcium acetate (Phoslo[®], Calphron[®]), calcium carbonate (Caltrate[®]), calcium/magnesium (Magnebind[®]), calcium/magnesium/fa (Magnebind[®] Rx), lanthanum carbonate (Fosrenol[®]), and sevelamer (RenaGel[®]) bind to phosphate and prevent it from being absorbed. Along with diet and dialysis, all of these agents are capable of controlling phosphate levels. However, the National Kidney Foundation (NKF) recommends calcium acetate as a first-line treatment option for hyperphosphatemia in patients with ESRD.

Calcium acetate is a phosphate binder indicated for the control of hyperphosphatemia in those with end-stage renal failure, and does not promote aluminum absorption. Patients are effectively controlled, though hypercalcemia may occur during treatment. Patients with higher-than-normal serum calcium levels should be closely monitored and their dose adjusted or terminated to bring levels to normal. Lanthanum carbonate is a calcium-free and aluminum-free phosphate binder indicated to reduce serum phosphate in patients with end-stage renal disease. Sevelamer is a calcium-free, metal-free phosphate binder indicated for the control of serum phosphorus in patients with chronic kidney disease on dialysis. Because it is non-absorbed, sevelamer controls phosphorus without the concerns of calcium or metal accumulation. Calcium carbonate, calcium/magnesium, and calcium/magnesium/fa are also indicated for hyperphosphatemia and are contraindicated in patients with hypercalcemia. The most common adverse effects for these electrolyte depleters are gastrointestinal in nature. Pruritis has also been reported during therapy with calcium acetate.

The initial dose of calcium acetate is 2 gelcaps (Phoslo[®]) or 1 to 3 tablets (Calphron[®]) with each meal. The dosage may be increased gradually to bring the serum phosphate value below 6 mg/dL, as long as hypercalcemia does not develop. Most patients require 3 to 4 gelcaps/tablets with each meal. Lanthanum carbonate tablets should be chewed completely before swallowing, and should be taken with or immediately after meals. The recommended initial total daily dose is 750 to 1500 mg, which should be titrated every 2 to 3 weeks until an acceptable serum

phosphate level is reached. The recommended starting dose for sevelamer is 800 to 1600mg, which may be administered as one to two 800-mg tablets or two to four 400-mg tablets with each meal based on serum phosphorus levels. Calcium carbonate, calcium/magnesium, and calcium/magnesium/fa tablets should also be taken with meals. Calcium carbonate is individually dosed and is based on clinical response. Calcium/magnesium and calcium/magnesium/fa are administered as 1 to 3 tablets with meals.

Generic Name	Brand Name	Manufacturer	Generic Available
Calcium Acetate	PhosLo [®] , Calphron [®]	Nabi, Nephro Tech	N
Calcium Carbonate	Caltrate [®] , etc.	Wyeth	Y
Calcium/Magnesium	Magnebind [®]	Nephro Tech	N
Calcium/Magnesium/FA	Magnebind [®] Rx	Nephro Tech	N
Lanthanum Carbonate	Fosrenol [®]	Shire	N
Sevelamer Hydrochloride	RenaGel [®]	Genzyme	N

Summary:

Available data suggest that all agents discussed are effective in treating hyperphosphatemia. NKF recommends calcium acetate as a first-line treatment option for hyperphosphatemia in patients with ESRD; however, lanthanum carbonate and sevelamer are appropriate options for patients with hypercalcemia. The preferred drug list should be based upon FDA-approved indications, efficacy, and cost.