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Lanthanum Carbonate

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Until recently, calcium salts were the only available phosphate binders considered safe for use in patients with chronic renal failure. These compounds eliminated the serious toxicity problems seen with aluminium-containing phosphate binders. However, the need for large doses and concomitant administration of potent vitamin D analogues led to other adverse events such as recurrent hypercalcaemia and adynamic bone disease. Hyperphosphataemia or increased serum calcium × phosphorus product levels are associated with increased mortality in haemodialysis patients and a direct relationship has been found between high serum calcium × phosphorus product levels and cardiac and vascular calcifications.[1,2] These reports have emphasised the need for safe calcium-free phosphate binders. Sevelamer is the only calcium- and aluminium-free phosphate binder currently approved in patients with end-stage renal disease. There is a lower incidence of hypercalcaemia with sevelamer compared with calcium-based phosphate binders.

Previous animal studies had shown that salts of rare earth metals are effective phosphate binders.[3] This led to the development of lanthanum carbonate as a phosphate binder in patients with chronic kidney disease. Lanthanum carbonate is as effective as calcium carbonate in reducing serum phosphorus levels, with a significantly lower incidence of hypercalcaemic episodes. Lanthanum carbonate may reduce the incidence of adynamic bone disease. Currently, studies addressing the effect of reduced calcium accumulation on cardiovascular calcifications and mortality have not been published, but improvements in vascular calcifications would be expected based on the experience with sevelamer. In studies of lanthanum carbonate in dialysis patients, serum lanthanum concentrations were extremely low with no evidence of accumulation up to 1 year. However, longer-term adverse event monitoring must continue to determine if chronic low-level tissue accumulation could be harmful. Second-generation lanthanum-based phosphate binders have been developed, using nanotechnology to increase phosphate binding capacity per unit surface and to reduce solubility of the compound.[4] These improvements should allow lower doses to be administered. Until the improved versions are available, lanthanum carbonate will remain an attractive new calcium-free phosphate binder for the treatment of hyperphosphataemia and its complications in dialysis patients. ▲

References

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