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Effect of Tenapanor on Serum Phosphate in Patients Receiving Hemodialysis

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ABSTRACT

Hyperphosphatemia is common among patients with CKD stage 5D and is associated with morbidity and mortality. Current guidelines recommend lowering serum phosphate concentrations toward normal. Tenapanor is a minimally absorbed small molecule inhibitor of the sodium/hydrogen exchanger isoform 3 that functions in the gut to reduce sodium and phosphate absorption. This randomized, double-blind, placebo-controlled trial assessed the effects of tenapanor on serum phosphate concentration in patients with hyperphosphatemia receiving hemodialysis. After a 1- to 3-week washout of phosphate binders, we randomly assigned 162 eligible patients (serum phosphate =6.0 to <10.0 mg/dl and a 1.5-mg/dl increase from before washout) to one of six tenapanor regimens (3 or 30 mg once daily or 1, 3, 10, or 30 mg twice daily) or placebo for 4 weeks. The primary efficacy end point was change in serum phosphate concentration from baseline (randomization) to end of treatment. In total, 115 patients (71%) completed the study. Mean serum phosphate concentrations at baseline (after washout) were 7.32–7.92 mg/dl for tenapanor groups and 7.87 mg/dl for the placebo group. Tenapanor provided dose-dependent reductions in serum phosphate level from baseline (least squares mean change: tenapanor =0.47–1.98 mg/dl; placebo =0.54 mg/dl; *P*=0.01). Diarrhea was the most common adverse event (tenapanor =18%–68%; placebo =12%) and frequent at the highest tenapanor doses. In conclusion, tenapanor treatment resulted in statistically significant, dose-dependent reductions in serum phosphate concentrations in patients with hyperphosphatemia receiving hemodialysis. Additional studies are required to clarify the optimal dosing of tenapanor in patients with CKD-related hyperphosphatemia.

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