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A Real-world Cost-effective Analysis of Sevelamer Versus Calcium-Based Binders for the Treatment of Hyperphosphatemia in Korean Dialysis Patients

Jang-Hee Cho*[1], Hye Min Jang[2], Taehoon Yim[1], Kyu Yeun Kim[1], Minjung Kim[1], Wonseok Do[1], Youngae Yang[1], Inryang Hwang[1], Su Kyung Lee[1], Hee-Yeon Jung[1], Ji-Young Choi[1], Sun-Hee Park[1], Chan-Duck Kim[1], Yong-Lim Kim[1]

[1]Internal Medicine, Kyungpook National University Hospital, [2]Statistics, Kyungpook National University, Daegu, Korea, Republic Of

Background: Sevelamer, a non-calcium based phosphate binder, has been shown to attenuate the progression of vascular calcification and improve survival in dialysis patients compared with calcium-based binders (CBBs). We conducted a cost-effectiveness analysis (CEA) comparing sevelamer with calcium acetate in dialysis patients using real-world data from the Health Insurance Review Agency (HIRA) database in Korea.

Methods: Data from 4674 patients enrolled in Korean multicenter prospective cohort study between September 2008 and December 2012 were linked to the HIRA database. After propensity score matching, the final dataset used in the CEA comprised 501 sevelamer-treated and 501 calcium acetate-treated patients. A Markov model was used to estimate costs, life years (LY), quality-adjusted life years (QALYs), and cost effectiveness. Forty-month treatment-specific survival available from the dataset was extrapolated to a lifetime horizon using Weibull regression analysis.

Results: Patients receiving sevelamer had lower mortality compared with patients receiving calcium acetate (hazard ratio, 0.64; 95% confidence interval, 0.45–0.91; p = 0.012). In the base case analysis, treatment with sevelamer was associated with a gain of 1.758 in LYs and 1.108 QALYs per patient compared with calcium acetate. The incremental cost effectiveness over a lifetime horizon was acceptable at KRW (South Korean Won, ₩) 6,966,350 per LY gained and ₩ 11,057,699 per QALY gained for sevelamer compared with calcium acetate. One-way sensitivity analyses demonstrated that sevelamer was cost effective compared with calcium acetate across a wide range of alternative assumptions. Probabilistic sensitivity analysis showed that sevelamer was cost effective in 100% of the model iterations, using a willingness-to-pay threshold of ₩ 31,355,740 per QALY gained.

Conclusion: Sevelamer was associated with better survival and acceptable cost effectiveness in dialysis patients compared with calcium acetate. Treatment of hyperphosphatemia with sevelamer could serve as a cost-effective alternative treatment option to CBBs in dialysis patients in Korea.

Keywords: calcium acetate, cost-effectiveness, dialysis, phosphate binder, sevelamer