



Indian Health Service



IHS National Pharmacy and Therapeutics Committee Non-calcium Containing Phosphate Binders November 2010

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Background:

Chronic Kidney Disease (CKD) is a multi-factorial condition affecting approximately 26 million American adults. CKD is most frequently caused by: diabetes, hypertension, autoimmune disease, systemic infections, urinary tract infections, urinary stones, urinary tract obstruction, neoplasm, family history, recovery from acute kidney failure, reduced kidney mass, medications and low birth rate. Of note, diabetes and hypertension are conditions frequently encountered in the American Indian/Alaska Native population. Approximately 16.3% of American Indian/Alaska Natives adults have diagnosed diabetes and have a 3.5 times higher rate of diabetes-related kidney failure compared with the general US population.

CKD is generally a progressive and irreversible condition that can eventually lead to “deterioration in mineral homeostasis, with a disruption of normal serum and tissue concentrations of phosphorus and calcium, and changes in circulating levels of hormones.”¹ At CKD stage 3, the kidneys ability to excrete phosphorus becomes reduced, leading to hyperphosphatemia and elevated parathyroid hormone (PTH). Additionally, 1, 25hydroxyvitamin D (1, 25 (OH)₂D) is reduced, thereby reducing intestinal calcium absorption. Therefore, one of the focal points of therapy is correction of the associated hyperphosphatemia. This hyperphosphatemia has been noted to increase mortality in patients with CKD. The associated effects of CKD on mineral metabolism has notable effects on soft tissue calcification, including areas of the lung (pulmonary fibrosis, hypertension) and heart (right side ventricular hypertrophy, right side heart failure, valvular calcification, arrhythmia’s, coronary artery calcification) among others.

Discussion:

Treatment of Hyperphosphatemia can include multiple options. In many clinical situations, calcium based products can be utilized to manage the hyperphosphatemia. However, in some instances, secondary hypercalcemia may develop due to the reduced ability to absorb calcium. In the event of hyperphosphatemia and secondary hypercalcemia, other options may be warranted. The non-calcium containing phosphate binders sevelamer or lanthanum may be utilized in this scenario. Each of these products have been shown to improve serum phosphate levels in patients with CKD. Both products have similar FDA approved indications for use; control/reduction of serum phosphorus levels in end-stage CKD/dialysis patients. Each product is dosed three times daily with meals and titrated to desired serum phosphorus level. National guidelines do not differentiate between products nor specifically endorse a product. The IHS National Pharmacy and Therapeutics Committee (NPTC) reviewed the non-calcium containing phosphate binders at its September 2010 meeting.

Findings:

For most patients with CKD induced hyperphosphatemia that require treatment, calcium based products would be considered first choice for patients without elevated serum calcium. For patients who cannot use calcium based products due to hypercalcemia, non-calcium based options should be considered. The available data reviewed by the NPTC did not reveal a clinically superior non-calcium containing phosphate binder when it compared the two products. Therefore, based upon the relative clinical equivalence, the available pharmaco-economic data and the IHS utilization data, *Renvela*® (sevelamer carbonate) was added to the IHS National Core Formulary with the criteria for use being “**patients on dialysis who cannot use calcium based phosphate binders due to hypercalcemia.**”

If you have any questions regarding this document, please contact the NPTC at nptc1@ihs.gov.

References:

- 1 KDIGO clinical practice guideline for the diagnosis, evaluation, prevention, and treatment of Chronic Kidney Disease-Mineral and Bone Disorder (CKD-MBD). *Kidney Int Suppl.* Aug 2009(113):S1-130.
- 2 K/DOQI clinical practice guidelines for bone metabolism and disease in chronic kidney disease. *Am J Kidney Dis.* Oct 2003;42(4 Suppl 3):S1-201.
- 3 The Facts About Chronic Kidney Disease. National Kidney Foundation Website. <http://www.kidney.org/kidneydisease/ckd/index.cfm#facts>. Accessed August 19, 2010. .
- 4 Bailie GR JC, Mason NA and St.Peter WL. Chronic Kidney Disease 2006: A Guide to Select NKF-KDOQI Guidelines and Recommendations. *National Kidney Foundation.* 2006.

5. Diabetes in American Indians and Alaska Natives: Facts At-a-Glance. Department of Health and Human Services. Indian Health Services Division of Diabetes Treatment and Prevention. <http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Resources/FactSheets/AIANs08.pdf>. Accessed August 19, 2010.
6. Indian Health Service Division of Diabetes Treatment and Prevention. Indian Health Diabetes Best Practice Chronic Kidney Disease. http://www.ihs.gov/MedicalPrograms/Diabetes/HomeDocs/Tools/BestPractices/2009_BP_Chronic_Kidney_Disease.pdf Accessed August 19, 2010. 2009.