



Editorial

Phosphate binders in patients with chronic kidney disease: Between the new and the old.

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Impaired phosphate excretion by the kidney leads to Hyperphosphatemia. It is an independent predictor of cardiovascular disease and mortality in patients with advanced chronic kidney disease (stage 4 and 5) particularly in case of dialysis. Phosphate retention develops early in chronic kidney disease (CKD) due to the reduction in the filtered phosphate load. Overt hyperphosphatemia develops when the estimated glomerular filtration rate (eGFR) falls below 25 to 40 mL/min/1.73 m².

Hyperphosphatemia is typically managed with oral phosphate binders in conjunction with dietary phosphate restriction. These drugs aim to decrease serum phosphate by binding ingested phosphorus in the gastrointestinal tract and its transformation to non-absorbable complexes [1].

Phosphorus binders:

Three main types of phosphate binder are available:

*Calcium-containing binders: calcium carbonate and calcium acetate are the most commonly used drugs. The main advantage of calcium binders is the low cost for equivalent efficiency. However, hypercalcemia and accelerated vascular calcification are the main concerns with calcium-containing phosphate binders, particularly when they are combined with vitamin D therapy.

*Aluminium-based binders are a second-line drug in non-dialysis chronic kidney disease. Their phosphate binding capacity is excellent. However, the aluminium accumulation toxicity limits the long term use.

*Non-calcium-based binders (sevelamer[®]; lanthanum[®]; sucroferric oxyhydroxide; and Ferric citrate) would not increase calcium level but this type is only available for dialysis patients. These binders are equally effective but may have relevant side effects, including gastrointestinal symptoms for sevelamer[®]

and risk of tissue accumulation for lanthanum[®]. Non calcium based binders are considerably more expensive [2].

Available phosphate binders are all effective in the treatment of hyperphosphatemia. According to some recent reviews, the calcium-free binders may limit the progression of vascular calcifications compared others binders [3].

How to choose?

Many studies and meta-analysis shows that there is no convincing evidence for improvements in cardiovascular mortality or fracture risk between calcium and calcium free binders [4]. How can we strongly justify the use of the new binders without evidence?

The choice of phosphorus binders should be based on serum calcium level, drugs side effects and cost. KDIGO recommends to maintain the serum phosphate in the normal range and to restrict the use of calcium binders in the presence of hypercalcemia, arterial calcification, bone disease or serum parathyroid hormone (PTH) concentrations less than two times the upper limit of the reference level. Non calcium based binders should be considered in patients with complicated diabetes mellitus, vascular calcifications and persistent inflammation. Iron based compounds could be a good option in case of iron deficiency [5].

Take home message:

Preventing severe hyperphosphatemia remains an important aim in the management of patients with kidney failure. However, the continuous monitoring of serum phosphate is sometimes difficult and lower levels of serum phosphate are not significantly correlated with better disease outcome. The choice of phosphorus binders should be studied carefully for each patients according to his history and personal factors. More randomized controlled trials are needed to confront different binders available.

References:

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