

Magnesium Based Phosphate Binder Caution

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Abstract:

As chronic kidney disease progresses through the 5 stages, hyperphosphatemia occurs, resulting in bone demineralisation, vascular and soft tissue calcification, cardiovascular disease and secondary hyperparathyroidism. Dietary restriction of phosphate alone becomes insufficient over time to counteract this process and various phosphate binders are commonly prescribed to reduce the absorption of phosphate from the gastrointestinal tract.

Magnesium calcium based phosphate binders have been shown to be non-inferior to Sevelamer for the management of hyperphosphatemia. However, there is a vast array of commercial magnesium-based supplements available to the Australian consumer. Considerable heterogeneity exists not only in their magnesium content, but the concentration of other additional ions like calcium, potassium and phosphate. We discuss these supplements and present them in a table. The clinician should note that caution should be exercised when prescribing these supplements, particularly to the chronic kidney disease population.

Introduction:

- Hyperphosphatemia, a marker of morbidity, often requires management via the use of phosphate binders in patients with advanced chronic kidney disease (stage 4 and 5).
- The phosphate binders currently available can be broadly categorised into calcium based and non-calcium based phosphate binders.
- Accelerated vascular calcification and increased cardiovascular mortality may occur with calcium based phosphate binders while the non calcium based phosphate binders are limited by cost. (1)
- Magnesium containing salts are an alternative that is commonly used for other indications including cramps and constipation. (2)
- Recent randomised controlled trials have shown that Magnesium-based phosphate binders have equivalent efficacy to Sevelamer, but at much lower cost. (3)

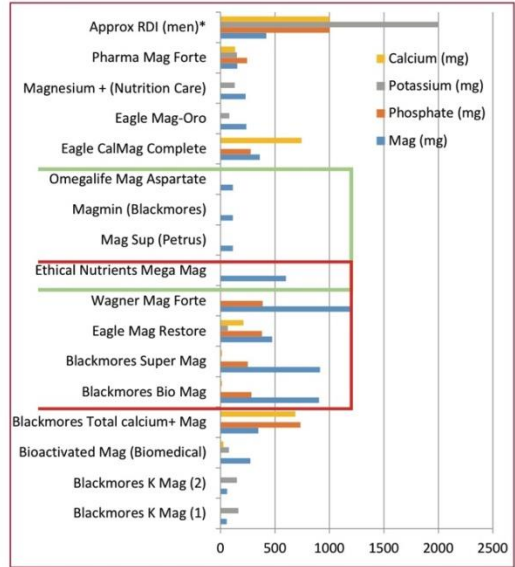
Methods:

- We compiled, analysed and confirmed with the manufacturers the composition of magnesium based supplements listed in MIMS (Monthly Index of Medical Specialties)
- We compared the concentrations of magnesium, phosphate, calcium and potassium in each of the supplements, based on three times a day dosing, with the recommended daily dietary intake for adults

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Results:



*RDI (Recommended dietary intake) values for males aged 31-70 years old with CKD stage 3 onwards. Values represent total content of calcium, potassium and magnesium for each supplement based on a three times a day dosing.
 (1) (2) - same name, different products. Green Box—supplements containing only magnesium.
 Red box—Supplements with high Mag contents

Discussion:

- Patients with chronic kidney disease have impaired renal regulatory mechanisms (5).
- Improper selection of supplements (in addition to dietary intake) may lead to exacerbation of hypercalcaemia/hyperphosphatemia in chronic kidney disease (1).
- Only 3 of 16 formulations had magnesium concentrations that did not risk causing potential magnesium, potassium or phosphate toxicity.

Conclusion:

- Magnesium salts avoid the calcium burden of traditional calcium based phosphate binders and offer a more cost effective alternative.
- However, caution needs to be exercised when magnesium based phosphate binders are prescribed particularly in the chronic kidney disease population.
- There is limited evidence comparing the efficacy of the various magnesium supplements as a phosphate binder.

Conflict of interest:

Wong Y.H.S has received travel and conference support from Amgen, Roche and Baxter.