

Potassium-Binding Resins: Associations with Serum Chemistries and Interdialytic Weight Gain in Hemodialysis Patients

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Commentary

By Professor Richard Glassock

Hyperkalemia is a serious and potentially life-endangering event that can develop in patients with ESRD undergoing hemodialysis. Studies of outcomes of such patients treated with orally administered ion exchange resins that bind potassium (K⁺) in the intestine (either sodium- or calcium-based) are very limited. The sodium-based K⁺ exchange resin (sodium-polystyrene sulfonate – Kayexalate®) might promote thirst and weight gain and thus have adverse effects on already hypervolemic dialysis patients, offsetting its beneficial effect on hyperkalemia-related complications. Hypercalcemia might be a complication of calcium-based ion exchange resins (calcium-polystyrene sulfonate – Kalimate®).

Jadoul and co-workers examined this question by analyzing the Dialysis Outcomes and Practice Patterns Study (DOPPS) data base for facilities (treating 11,409 patients) having ~5% utilization of such resins (Belgium, Canada, France, Italy and Sweden). Other geographic regions, including the USA and Japan, had <5% utilization of K⁺ binding resins and were not included in the analysis. Interestingly, the utilization of such resins varied widely from about 5% to as many as 50% (median) of patients. Such a wide variation in practice patterns is completely unexplained, as the prevalence of potentially life-threatening hyperkalemia is not that widespread or variable among dialysis-treated patients, and the use of such resins in the USA is much less than 5% of patients.

Not surprisingly, the use of resins decreased the K⁺ concentration, but at an expense of higher inter-dialytic weight gain (IDWG; about 0.25 kg on average). Serum bicarbonate, phosphate and sodium levels also increased in resin users. However, resin use was not associated with higher all-cause mortality, but data on specific causes of death (such as congestive heart failure or sudden cardiac death) are lacking and might be important. These resins (sodium based) can promote GI absorption of phosphate, and this can lead to higher serum phosphate levels and/or a higher requirement for oral phosphate binder prescription. The use of K⁺ ion exchange resins plus sorbitol (to prevent constipation) can evoke colonic ulceration and perforation, but it was not possible to examine this complication in this analysis.

It seems clear from this analysis that a wide (and largely unexplained) variation in prescription of oral K⁺-binding resins in hemodialysis treated subjects is common (at least in Europe). While no impact of such prescribing behaviors on crude all-cause mortality is evident, the effects of such prescription on IDWG, phosphate levels and oral phosphate binder requirements is disconcerting, to say the least. I agree with the authors: it is time for a rigorous examination of these practices by a suitably designed randomized controlled trial.

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