Sodium Polystyrene Sulfonate Usage and Incidence of Bowel Necrosis

Background: Sodium polystyrene sulfonate (SPS, Kayexalate) is a widely-used cation-exchange resin for the treatment of hyperkalemia. Although this agent is highly effective, incidences of serious injury and death from bowel necrosis secondary to SPS usage have been reported. Many hospitals throughout the United States have SPS on their medication formulary, but alternative potassium-binding agents are available. The primary objective of this retrospective medication use evaluation is to review the incidence of SPS-induced bowel necrosis in an inpatient setting. The results will be used to evaluate the status of SPS on the hospital formulary.

Methods: This retrospective medication use evaluation did not require submission to the Institutional Review Board. Historical electronic medical records will be utilized to identify patients at six SSM Health facilities from January 1 through December 31, 2019 who received at least 15 grams of SPS during their hospitalization. Patients who meet the above criteria will be included for review and the following data will be collected: age, sex, weight, height, medical history, the total dose of SPS administered, the serum potassium level pre-and post-SPS, bowel movement abnormalities, concomitant sorbitol administration, renal function, recent surgery, and whether bowel necrosis occurred. All data will be recorded without patient identifiers and maintained confidentially. Data will be analyzed to evaluate the incidence of bowel necrosis secondary to SPS administration at SSM Health.

Results: In 2019, 999 patients received at least 15 grams of SPS; the study time frame was narrowed to December 2019 (n=77), but also included patients throughout the year who were prescribed scheduled SPS (n=5). The incidence of SPS-induced bowel necrosis in this evaluation was 0 (0/82, 0%). Additionally, there were no instances of co-administration of sorbitol and SPS (0/82, 0%). Each of the 5 patients prescribed scheduled SPS received two 15-gram doses of SPS during their hospitalization. Seventeen patients (17/82, 20.7%) with a serum potassium less than 5 mEq/L and 3 patients (3/82, 3.6%) with emergent hyperkalemia received SPS. The average change in serum potassium within 24 hours after administration of SPS was -0.73 mEq/L. For 11 patients (11/82, 13%), follow-up serum potassium levels were not obtained within 24 hours. Of the ten providers found to prescribe SPS most often, 50% were internal medicine specialists, while 30% and 20% were emergency medicine providers and nephrologists, respectively.

Conclusions: The results seen from the sampled patients in this evaluation suggest limited risk of SPS-induced bowel necrosis. Future directions of this study include provider education to ensure appropriate usage, monitoring, and follow-up is adhered to.