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Evaluating the Effect of Sodium Zirconium Cyclosilicate in Acute Hyperkalemia Management

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Introduction

- Sodium zirconium cyclosilicate (ZS-9) can acutely decrease serum potassium (K) levels after one dose and may have favorable side effects compared to sodium polystyrene sulfate (SPS)[1,2]
- ZS-9 replaced oral SPS in the Hyperkalemia Order Set at St. Cloud Hospital in April 2019

St. Cloud Hospital Hyperkalemia Order Set		
	Medication	Dose & Route
X	Calcium gluconate	1 g IV
X	Insulin regular / dextrose	10 units / 25 g IV
	ZS-9	10 g PO
	Sodium polystyrene sulfate	30 g PR
	Furosemide	40 mg IV
	Albuterol	10 mg nebulized
	Sodium bicarbonate	50 mEq IV

X: Pre-checked in the order set
* Labs drawn 2 hours after treatment completion

Purpose

- **To characterize the acute potassium-lowering effects of one 10-gram dose of sodium zirconium cyclosilicate in conjunction with other potassium-lowering medications**

Methods

- IRB-approved, retrospective chart review of adult patients receiving at least one dose of ZS-9 for hyperkalemia from June 1 through August 31, 2019
- Potassium levels and additional therapies were recorded for 24 hours post ZS-9 administration

Results

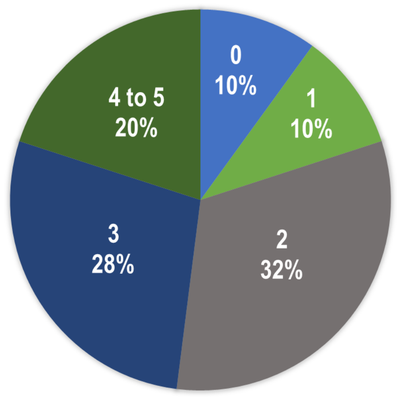
67 Screened

17 Excluded
2: insulin infusion
6: no repeat K in 12 hours
5: oral SPS use
2: pseudohyperkalemia
2: incomplete charting

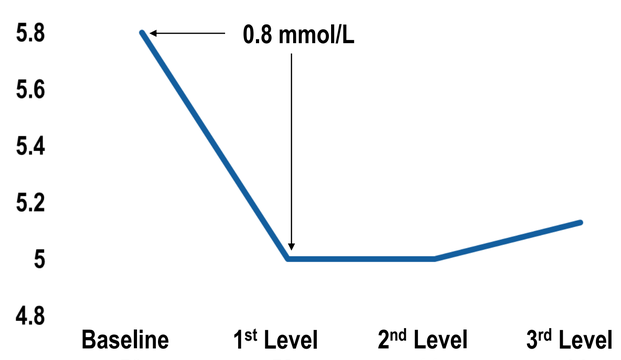
50 included

Patient Characteristics	
Age (mean ± SD), years	68.1 ± 12.1
Female gender, n (%)	17 (34%)
CKD, n (%)	28 (56%)
Dialysis, n (%)	7 (14%)
Insulin-dependent diabetes, n (%)	16 (32%)
Presence of AKI, n (%)	37 (74%)
Baseline K (mean ± SD), mmol/L	5.8 ± 0.53

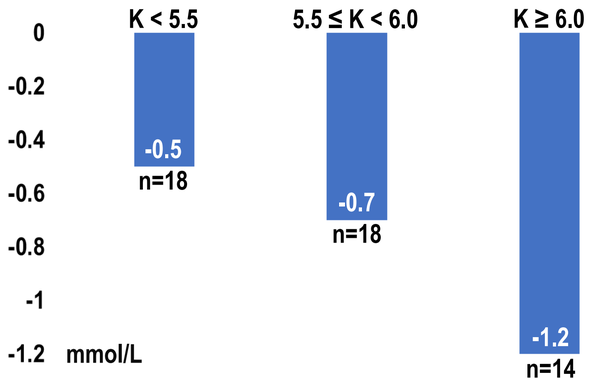
Additional Initial K-Lowering Medications



Mean K Level After ZS-9 Administration



Mean Change in K Based on Initial K Level



Secondary Outcomes	
Repeat ZS-9 dose given, n (%)	15 (30%)
24-hour resolution of hyperkalemia, n (%)	46 (92%)
Hypokalemia within 48 hours, n (%)	2 (4%)
Return of hyperkalemia in admission, n (%)	14 (28%)

Evaluation

- Mean decrease in potassium level (0.8 mmol/L) was slightly greater than studies evaluating one 10-gram dose of ZS-9 (0.4 mmol/L at 2 and 4 hours)[1,2]
- As seen in previous trials, ZS-9 had a greater effect when used for severe hyperkalemia[2]
- Hypokalemia rates (4%) were higher than previous trials (0%), possibly attributed to the use of several potassium-lowering medications[1,2]
- Limitations include lack of assessment of adverse effects and concomitant potassium-raising medications as well as inclusion of 5 patients who received dialysis within 24 hours of ZS-9 administration

Conclusion

- **One 10-gram dose of sodium zirconium cyclosilicate effectively lowers serum potassium when utilized in a hyperkalemia order set**

References

1. Packham DK, Rasmussen HS, Lavin PT, et al. Sodium zirconium cyclosilicate in hyperkalemia. N Engl J Med. 2015;372(3):222-31
2. Kosiborod M, Rasmussen HS, Lavin P, et al. Effect of sodium zirconium cyclosilicate on potassium lowering for 28 days among outpatients with hyperkalemia: the HARMONIZE randomized clinical trial. JAMA. 2014;312(21):2223-33

Disclosure

Authors of this presentation disclose the following relationships with commercial interests related to the subject of this poster:
Austin Brandes: nothing to disclose
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Paul Huiras: nothing to disclose