Relypsa For ED Acute Hyperkalemia Control and Reduction

(REDUCE)

NCT 02933450

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Protocol and Statistical Analysis

Study design and setting: This is a single center, single blinded, open label, feasibility pilot study performed at a large inner-city academic ED. The study was approved by the institutional review board.

Selection of participants: Patients ≥18 years of age and ESRD, who had serum potassium ≥ 6.0mEq/L, were eligible for enrollment. Exclusions were: i) a significant arrhythmia on initial EKG (determined by clinical provider), ii) known allergy to patiromer, iii) an oral potassium binder administered prior to enrollment, iv) pregnancy, v) not anticipated to need medical management of hyperkalemia for at least 4 hours (i.e. hemodialysis unit and staff available for emergent dialysis and medical management is not necessary).

Interventions: After obtaining informed consent, patients were randomly assigned to standard-of-care (SOC) or a single dose of 25.2g oral patiromer plus SOC (PAT) cohort. Standard-of-care is defined as intervention provided by clinical provider according to individual practice pattern or hospital protocol. Providers were blinded to treatment assignment and all data gathered by the research team. Patients were observed with telemetry monitoring for up to 10 hours or until they received hemodialysis, whichever occurred first. Blood draws and electrocardiograms (ECGs) were performed at enrollment and at 1, 2, 4, 6 and 8hrs hours thereafter.

Outcomes: The primary outcome was the difference in serum potassium between SOC and PAT groups at 2, 4, and 6 hours. Recorded adverse events included rates of new gastrointestinal symptoms, hypomagnesemia, and hypoglycemia.

Analysis: Demographic characteristics were analyzed with Wilcoxon rank sum and Chi-squared test. Baseline serum potassium was compared using median and inter-quartile range (IQR). A mixed-effect linear regression model with an unstructured covariance structure was used to model potassium levels by adjusting for time, group interaction, and baseline potassium. The adjusted means of potassium levels over time were computed for each group. Contrasts between the two groups at each time point were evaluated and adjustment of multiple comparisons was made using Bonferroni's method. The amount of insulin and albuterol given and the number of interventions within 2, 4, and 6 hours were compared using the Wilcoxon rank sum test.

Adverse events were reported and analyzed using Fischer's exact test or Chi squared test. Analyses were conducted per protocol basis; patients who went for hemodialysis treatment before 4hrs of medical treatment were excluded from the analysis