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## **REal World EVidence for TrEATment of HyperkaLemia in the Emergency Department (REVEAL - ED): a Multicenter, Prospective, Observational Study (Clinical Summary)**

The purpose of this multicenter, prospective, observational study was to evaluate the treatment patterns of emergency department (ED) hyperkalemia management including their effectiveness and safety. Two- hundred and three patients  $\geq 18$  year of age with hyperkalemia (serum potassium values  $\geq 5.5$  mEq/L) were enrolled at 14 sites in the United States. Of the patients enrolled, one patient withdrew consent to participate. Deaths occurred in 3 patients, at 4, 6, and 13 days post-enrollment. Potassium-lowering therapies and potassium values were documented at 30 minutes, 1, 2, 4, 8, 12, and 24 hours following initial ED treatment. The primary endpoint was absolute change in potassium over 4 hours.

Patient demographics and possible causes of hyperkalemia are described in the Table. The median (interquartile range, IQR) time to treatment was 2.7 (1.9, 3.5) hours after ED arrival. Forty-three different treatment combinations were employed in the first 4 hours to treat hyperkalemia; insulin/glucose (n=130; 64%) was used most frequently. In patients treated with medications alone, the initial median (IQR) potassium level was 6.2 (5.7, 6.8) mEq/L and decreased to 5.3 (4.8, 5.7) mEq/L within 4 hours. Patients treated with hemodialysis had an initial median (IQR) potassium level of 6.6 (6.2, 7.0) mEq/L which decreased to 3.8 (3.6, 4.2) within 4 hours. Clinically relevant hypoglycemia, as determined by the investigator, occurred in 6% of patients overall and in 17% of patients who received insulin/glucose therapy for a potassium level  $>7.0$  mEq/L. Although treatment effectively lowered potassium levels only hemodialysis normalized median potassium levels within 4 hours. Overall, 79% of the patients

were hospitalized and three died. The results of this observational study suggest that the treatment practice patterns for hyperkalemia in the ED are highly variable and complex.

**Table 1. Patient Demographics and Possible Causes of Hyperkalemia**

Mean (SD) or n (%)	Patients (n = 203)
Age in years, mean (SD)	56.4 (15.8)
Male, n (%)	124 (61)
Race, n (%)	
African American	104 (51)
White	97 (48)
Asian	1 (0.5)
Other	1 (0.5)
Ethnicity, n (%)	
Not Hispanic	172 (85)
Hispanic	31 (15)
ED visit or hospitalization for hyperkalemia in last 6 months, n (%)	69 (34)
History of heart failure, n (%)	77 (38)
History of diabetes, n (%)	109 (54)
History of chronic kidney disease, n (%)	149 (73)
CKD Stage (as reported by the investigator), n (%)	
2	2 (1)
3	26 (13)
4	20 (10)
5	97 (48)
Currently receiving hemodialysis, n (%)	94 (46)
Possible causes of hyperkalemia*, n (%)	
Chronic kidney disease	135 (67)
Diabetes	54 (27)
Acute kidney failure	57 (28)
ACEIs/ARBs	32 (16)

\*Occurring in  $\geq 5\%$  patients.