



## INTRODUCTION

- Diabetic ketoacidosis (DKA) is characterized by uncontrolled hyperglycemia, metabolic acidosis, and ketonemia<sup>1</sup>
- Insulin’s role in DKA is to halt lipolysis and ketogenesis, eventually resolving acidosis<sup>2</sup>
- The American Diabetes Association (ADA) recommends two different weight-based initial insulin drip rates in managing DKA: (1) 0.14 units/kg/hour infusion or (2) 0.1 unit/kg bolus followed by 0.1 units/kg/hour infusion<sup>1</sup>
- Insulin drip rates lower than the guideline recommended doses are used to avoid unnecessary hypoglycemia or hypokalemia, but no research has been done to assess the effectiveness of this strategy
- Some studies suggest despite euglycemia, appropriate weight-based dosing is necessary to avoid delaying resolution of DKA and resolving ketonemia<sup>2</sup>, others suggest that doses lower than 0.1 unit/kg/hour may be enough to suppress lipolysis and ketogenesis<sup>3</sup>
- A pilot study found no difference in time to resolution of ketoacidosis comparing patients initiated on a non-weight insulin drip versus a weight based insulin drip
- This study will add to the pilot study in assessment of safety of the different insulin drip rates, focusing on hypoglycemia and hypokalemia

## ENDPOINTS

### Primary

- Number of hypoglycemic events while on an insulin drip defined as a blood glucose less than 70 mg/dL

### Secondary

- Hypokalemia (potassium < 3.5 mEq/L) while on insulin drip
- Time in the intensive care unit
- Length of hospital stay
- Time on an insulin drip
- Death

## METHODS

- IRB approved retrospective cohort chart review from November 1, 2020 to September 31, 2021
- Baseline characteristics were obtained including: age, weight, height, type of diabetes, hemoglobin A1c (within 3 months prior to admission); primary and endpoint data were collected including initial labs, insulin drip rates, insulin drip start times, end times, hypoglycemia and hypokalemia events
- Descriptive statistics, two-sample t-test, and chi-square tests used to address baseline demographics characteristics; parametric tests used to examine continuous variables between the two independent samples

TABLE 1: Inclusion & Exclusion Criteria

INCLUSION CRITERIA	EXCLUSION CRITERIA
<ul style="list-style-type: none"> <li>• INTERNATIONAL CLASSIFICATION OF DISEASE FOR DKA</li> <li>• ADMITTED THROUGH THE ED AT OSUMC</li> </ul>	<ul style="list-style-type: none"> <li>• LEFT AGAINST MEDICAL ADVICE</li> <li>• DIRECTLY ADMITTED TO THE HOSPITAL</li> <li>• DID NOT RECEIVE INSULIN DRIP IN ED</li> </ul>

## RESULTS AND DISCUSSION

FIGURE 1: Sample Size



TABLE 2: Baseline Demographics – Abbreviated

CATEGORY	WEIGHT (N = 42)	NON-WEIGHT (N = 31)
AGE – mean	42.7	46.9
FEMALE – n (%)	17 (40)	8 (26)
PRECIPITATING FACTOR n (%):		
Compliance *p=0.024	31 (74)	15 (48)
Other	11 (26)	16 (52)
WEIGHT – mean kg	69.8	79.6
GLUCOSE ON ADMIT – mean mg/dL	693	639

TABLE 3: Results – Focused

CATEGORY	WEIGHT (N = 42)	NON-WEIGHT (N = 31)	P – VALUE
<b>PRIMARY OUTCOME:</b>			
Hypoglycemia on <i>initial</i> insulin drip, n	12	1	0.005
<b>SECONDARY OUTCOMES:</b>			
Hypokalemia on <i>any</i> insulin drip, n	10	8	>0.05
Death, n	0	3	0.072
Time on any insulin drip – mean hrs.	26.1	27.8	0.81
Time on <i>initial</i> insulin drip – mean hrs.	16.6	4.1	<0.001
ICU length of stay – mean hrs.	33.6	89.9	0.099
Hospital length of stay – mean hrs.	68.9	131.6	0.066

## DISCUSSION

- Weight-based drips were associated with a statistically significant higher amount of hypoglycemia on the initial insulin drip, this may have little clinical significance as the average time on the initial insulin drip was statistically lower in the non-weight group
- Average times on an insulin drip between groups were not statically different, however there may be a clinical significance in the time spent both the ICU and hospital, favoring the weight based group.

## REFERENCES AND DISCLOSURES

1. Kitabchi AE, Umpierrez GE, Miles JM, Fisher JN. Hyperglycemic Crises in Adult Patients with Diabetes. *Diabetes Care* 2009;32(7):1335-1343
2. French EK, Donihi AC, Korytkowski MT. Diabetic ketoacidosis and hyperosmolar hyperglycemic syndrome: review of acute decompensated diabetes in adult patients. *BMJ* 2019;365:l1114.
3. Cardoso L, Vicente N, Rodrigues D, et al. Controversies in the management of hyperglycaemic emergencies in adults with diabetes. *Metabolism Clinical and Experimental* 2017;68:43-54.

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