

Title: Evaluation of hypoglycemic events and complications in treating diabetic ketoacidosis (DKA) and hyperosmolar hyperglycemic syndrome (HHS) for patients with impaired renal function

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**Introduction:** Diabetic Ketoacidosis (DKA) and Hyperosmolar Hyperglycemic Syndrome (HHS) are severe metabolic complications of diabetes that require correction with insulin. The kidneys play a pivotal role in clearance and degradation of insulin; however, there is scarce evidence in managing insulin for patients with impaired renal function.

**Methods:** This retrospective cohort included patients 18 years of age or older who received treatment for DKA or HHS with an insulin infusion for at least one hour between 9/18/2018 and 6/30/2019. The primary outcome was the difference in rate of hypoglycemia in patients with normal renal function compared to impaired renal function, defined as eGFR < 60 mL/min. Chi-square or Fisher's exact test was used for categorical data and Student t-test for continuous data.

**Results:** One hundred eighty-five patients were included; 120 with normal renal function and 65 with impaired renal function. The incidence rate of hypoglycemia was 15.8% in patients with normal renal function and 24.6% in patients with impaired renal function (P=0.1701). The number of times that individual patients experienced hypoglycemia was increased in patients with impaired renal function (P=0.0431). Impaired renal function also had greater incidence of hyperkalemia, number of days in the hospital and ICU, and mortality.

**Conclusions:** There was no difference in the incidence rate of hypoglycemia between study groups; however, patients with impaired renal function had more recurrent events of hypoglycemia as well as increased number of complications associated with treatment. Treatment of DKA and HHS in patients with renal deficiency may require stricter management to prevent complications.