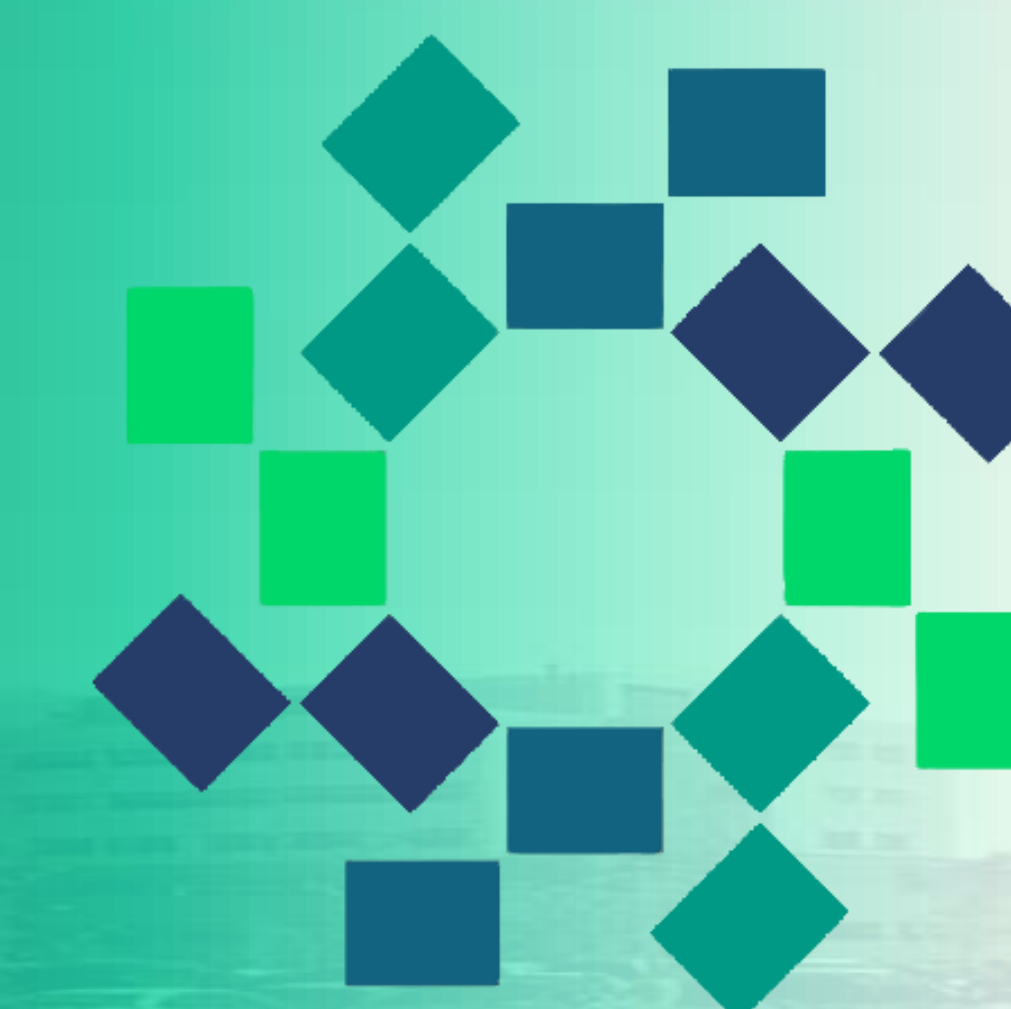




Geographical Variation of Hypoglycemia as a Complication of Diabetic Ketoacidosis Management: A National Cohort Study



A. Alshami¹; S. Douedi¹; T. Purewal¹; M. Alazzawi¹; A. Mararenko¹; M. Hossain¹; J. Cheng²; S. Patel¹.

¹ Department of Medicine, Jersey Shore University Medical Center, Neptune, NJ, United States.

² Division of Endocrinology and Metabolism, Jersey Shore University Medical Center, Neptune, NJ, United States.

PURPOSE

- Hypoglycemia is a well-established complication of diabetic ketoacidosis treatment.
- The rate of hypoglycemia is affected by clinical and non-clinical factors.
- We aimed to discover if the rate of this complication depends on the geographical location of the hospital.

METHODS

- Retrospective cohort study.
- Utilized the Healthcare Cost and Utilization Project National Inpatient Sample (HCUP-NIS) 2017 database.
- Participants: Patients with type 1 diabetes mellitus admitted for diabetic ketoacidosis.
- Missing data were imputed using multiple imputation (MI) method.
- Multivariable binary logistic regression model to calculate the adjusted odd ratios.
- Alpha < 0.05 was considered significant.

RESULTS

- A total of 3,117 admissions were found.
- Hypoglycemia occurred in 18.1% (n=565).
- There was a significant variation in the incidence of hypoglycemia between different geographical regions, as represented in **Figure 1**.
- The differences were present even after adjusting for age, admission day (weekend or weekday), gender, type of insurance, race, and being underweight in a multivariable logistic regression analysis (**Table 1**).

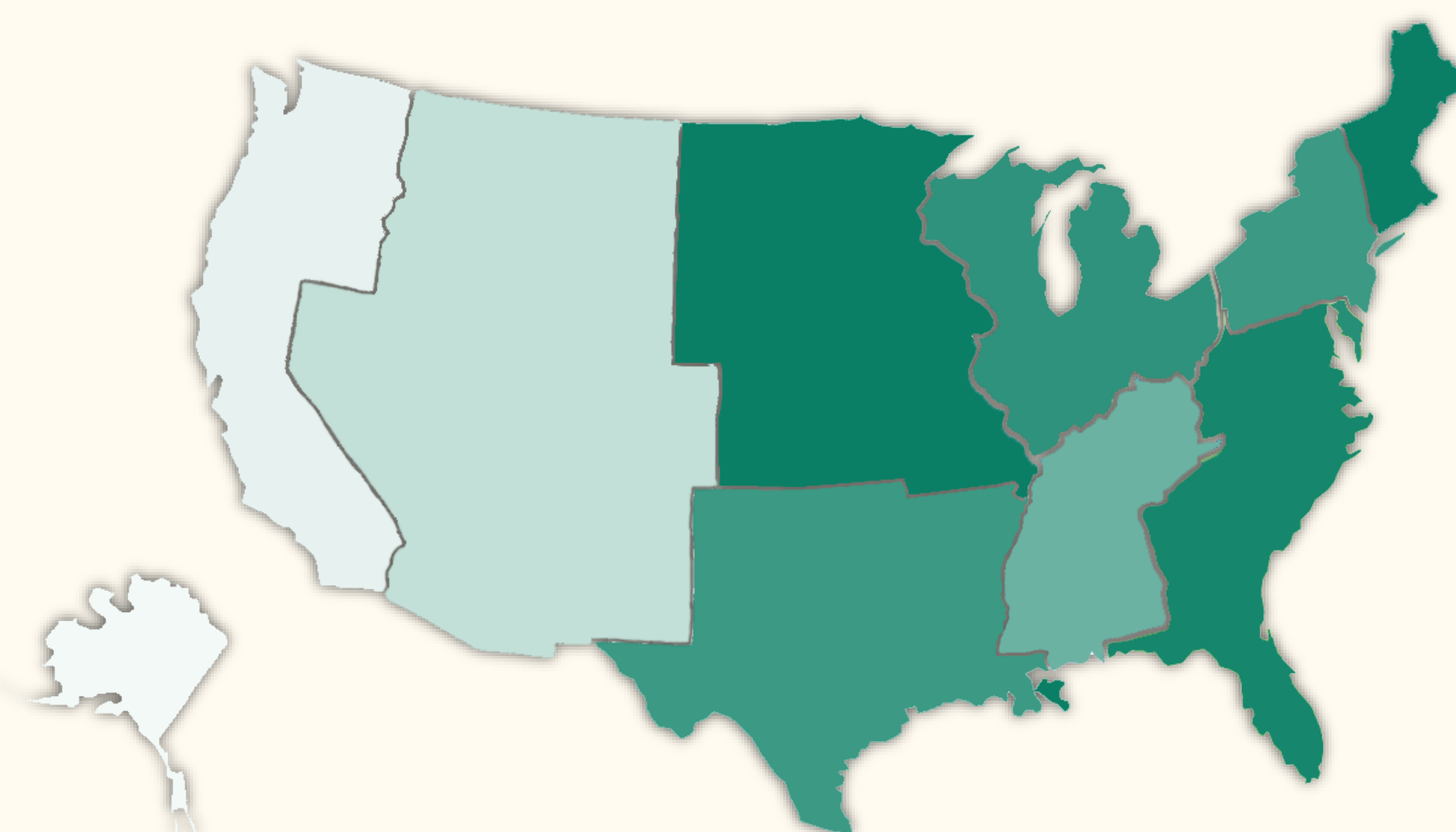


Figure 1. Divisions with higher rate of hypoglycemia are depicted in darker color.

Variable	OR	95% CI for OR	p Value
Age	0.991	0.984-0.998	0.010
Admission day (Weekend)	0.874	0.705-1.085	0.223
Female Sex	1.048	0.860-1.278	0.642
Census Division - New England	1		Ref
Census Division - Mid-Atlantic	0.842	0.598-1.185	0.323
Census Division - East North Central	0.884	0.639-1.222	0.454
Census Division - West North Central	1.043	0.689-1.578	0.842
Census Division - South Atlantic	0.917	0.638-1.318	0.640
Census Division - East South Central	0.685	0.406-1.158	0.158
Census Division - West South Central	0.789	0.487-1.276	0.334
Census Division - Mountain	0.513	0.299-0.881	0.016
Census Division - Pacific	0.437	0.265-0.720	0.001
Insurance – Medicare	1		Ref
Insurance – Medicaid	0.842	0.634-1.118	0.234
Insurance – Private insurance	0.888	0.696-1.133	0.338
Insurance – Self-pay	1.052	0.588-1.882	0.864
Insurance – Other	0.973	0.453-2.078	0.943
Race – white	1		Ref
Race – black	0.975	0.726-1.309	0.864
Race – Hispanic	1.414	0.948-2.108	0.089
Race – Asian or Pacific Islander	0.841	0.186-3.794	0.821
Race – Other	0.380	0.089-1.621	0.191
Underweight	0.995	0.605-1.638	0.986

Table 1. Multivariate logistic regression model to predict in-hospital occurrence of hypoglycemia in patients admitted for diabetic ketoacidosis.

CONCLUSION

- The incidence of hypoglycemia as complication of diabetic ketoacidosis management in patients with type 1 diabetes mellitus differed between geographical regions in the United States.
- Further investigation to determine the potential etiologies of such variation is warranted.

CLINICAL IMPLICATIONS

- Investigation of differences in the diabetic ketoacidosis protocols, regional target glycemic control, and other cultural/practice differences can help decreasing this life-threatening complication.

Abbas Alshami, MD
 Jersey Shore University Medical Center
 1945 Route 33
 Neptune, NJ 07753
 Email: abbas.alshami@hmhn.org