Incidence of Hypoglycemia in Patients with Type 2 Diabetes when Home Insulin Dose is Resumed vs Reduced While Inpatient

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BACKGROUND

- Diabetes has a prevalence rate in the United States around 11.6%.[1,2]
- Many of these patients require insulin while hospitalized.
- Current guidelines suggest modifying home insulin doses but make no specific recommendations.
- Many factors may affect insulin requirements such as A1c, nutrition status, compliance, medications, and comorbid conditions.[3]
- Inpatient hypoglycemia has been linked to longer length of stay, increased falls, and increased mortality.[2]
- This study aimed to determine if there is an increase in incidence of hypoglycemia in those who have home insulin doses resumed vs decreased while hospitalized.

METHODS

Retrospective Chart Review
- Included admissions at a community teaching hospital from February 18, 2023 through August 31, 2024.
- Primary endpoint- Incidence of hypoglycemia (BS <70) within 48 hours of insulin being restarted.
- Secondary endpoints- Length of stay, Glucagon/D5W administration for hypoglycemia, and time to hypoglycemia.
- Inclusion Criteria
  - Age 18-89
  - Diagnosis of Type 2 Diabetes on insulin
- Exclusion Criteria:
  - BS < 70 on admission, diagnosis of type 1 diabetes, DKA/HHS, home dose increased, insulin drip or insulin pump, glucocorticoid use.
- Statistical Analysis
  - Chi-square test or Fischer's exact test was used to assess nominal data as appropriate.
  - Students t-test was used to assess continuous data.

RESULTS

Figure 1: Enrollment
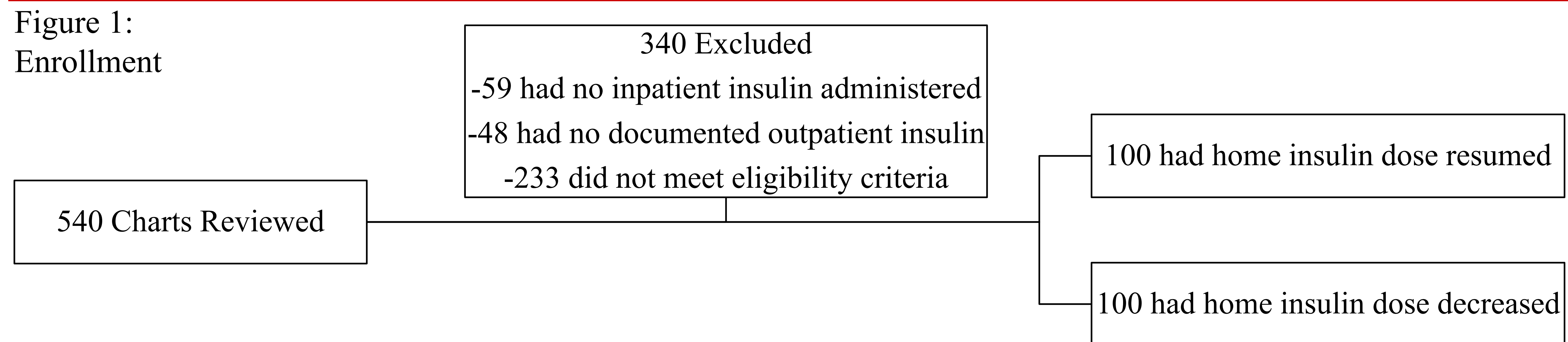
Table 1: Baseline Characteristics

Characteristics	Home Dose Resumed (N=100)	Home Dose Decreased (N=100)	P-Value
Mean Age (years)	73	72	0.349
Gender-Male (%)	57	52	0.570
Mean Admission Blood Sugar (mg/dl)	183	183	0.970
Mean BMI (kg/m^2)	32.9	33.1	0.897
Mean A1c (%)	8.27	8.31	0.892
Oral antidiabetic outpatient (%)	49	45	0.671
Mean Scr on Admission (mg/dl)	1.79	1.71	0.687
Mean Scr on Discharge (mg/dl)	1.69	1.59	0.289
Inpatient Fluoroquinolone (%)	5	6	0.756
Inpatient Antipsychotic (%)	2	3	0.651
Inpatient B-blocker (%)	56	61	0.315

Table 2: Endpoints

	Home Dose Resumed (N=100)	Home Dose Decreased (N=100)	Odds Ratio or Mean Difference (95% CI)	P-Value
Incidence of Hypoglycemia (# of readings of BS < 70)	20	7	3.32 (1.34-8.26)	0.007
D5W or Glucagon Administration (# of administrations per group)	8	2	4.26 (0.822-20.59)	0.101
Time to Incidence of Hypoglycemia (Hours)	21.92	23.94	2.02 (-9..36-13.40)	0.717
Length of Stay (Days)	6.15	6.44	-0.29 (-3.54- 2.97)	0.861

DISCUSSION

- Resumed group was associated with a significantly increased risk of hypoglycemia vs decreased group.
- The average reduction in total daily insulin doses in the reduced group was 52 percent (Average of 63 TDI on admission to 30 TDI).
- Not significant, but higher rates of D5W/glucagon administration seen in resumed group.
- Strengths:
- Similar baseline characteristics across both groups.
- Assessed for other therapies which may alter glucose.
- May help provide guidance in a grey area of practice.
- Average reduction in home insulin dose was reported for the decreased group, an area lacking in other studies.
- Limitations:
- Retrospective design, increasing likelihood of confounding variables affecting the results.
- Hemoglobin A1c data was missing on 70% of patients, so while this study's population had better baseline control than prior trials, these numbers may have been skewed.
- This study did not report sliding scale insulin usage which may have impacted blood glucose in some patients.

CONCLUSIONS

- The results of this study show resuming home insulin doses was associated with a significantly increased risk of hypoglycemia compared to decreasing the dose in hospitalized patients.

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