Identifying and Addressing Overbasalization in Outpatient Insulin Therapy Using CGM Data

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Introduction

- The ADA cautions against overbasalization, as it is a risk factor for hypoglycemia; current literature suggests rates of overbasalization range from 5.7-40%[1-3]
- Overbasalization is defined as a basal insulin dose of ≥ 0.5 units/kg or a bedtime-to-morning (BeAM) difference of ≥50 mg/dL [3,4]
- Continuous glucose monitors (CGM) can be a tool to identify overbasalization in patients and address suboptimal glycemic control[5]

Objectives

- **Primary Objective:** Determine the prevalence of insulin overbasalization through CGM utilization
- **Secondary Objectives:** Assess changes in glycemic control following CGM initiation and identify patient characteristics associated with overbasalization

Methods

- Retrospective chart review included patients with established care at the internal medicine clinic between January 2023 and November 2025
- Inclusion: Age ≥18 years, type 2 diabetes, on basal insulin for ≥3 months, at least one HbA1c value within 3 months before and after CGM initiation
- Exclusion: Type 1 diabetes, pregnancy, active malignancy or palliative care, incomplete CGM data (<70% wear time over 14 days)
- Demographics and clinical data obtained from EMR, CGM data gathered from Dexcom Clarity platform

Results

Baseline Demographics	Entire Population (n=53)	Overbasalized Patients (n=30)
Age (years)	62.2 ± 10	62.7 ± 10.7
Female Sex (%)	54.7	62.1
BMI (kg/m^2)	33.7 ± 9.6	31.8 ± 6.8
A1c (%)	8.9 ± 2.1	8.6 ± 1.7
CGM Data		
Time Very High (%)*	8 [IQR 31]	15 [IQR 20.5]
Time High (%)	26 ± 12.2	27 ± 9.5
Time in Range (%)	54.3 ± 27.6	52.8 ± 22.7
Time Below Range (%)	Negligible (<1)	
Average Glucose (mg/dL)	189.1 ± 52.6	190.2 ± 45.3
GMI (%)	7.8 ± 1.3	7.8 ± 1.1

* Reported as Median

Average Duration of CGM Use

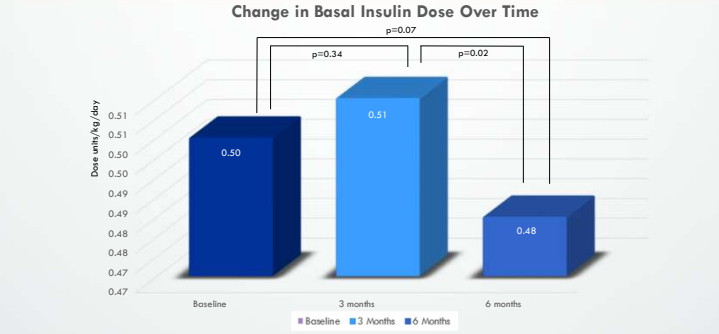
- 3 months: 105.1± 5.8 days
- 6 months: 197.4 ± 16.3 days

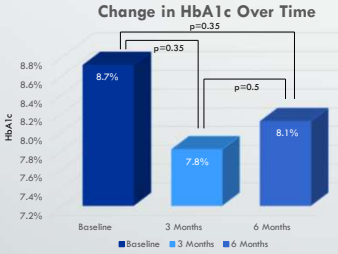
Time CGM Active

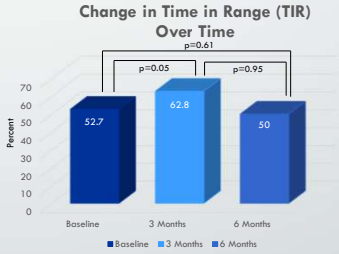
- 3 months: 95.1%
- 6 months: 94.8%

- Overbasalization of insulin was identified in 57% of patients
- CGM data contributed to reduction in overbasalization in 90% patients
- BeAM was reduced from 63.5 mg/dL at baseline to 56.7 mg/dL at 6 months (p=0.09)

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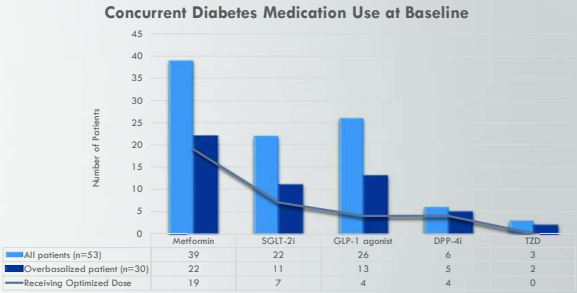


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Results

- 27% of the patients met both the daily basal insulin dose and difference in BeAM criteria for overbasalization.
- Of the overbasalized patients, 67% had follow-up data
- Reduction in overbasalization was observed in 17/20; of those, 8/20 had a decrease in basal insulin dose and 9/20 a decrease in BeAM



- In the overbasalized population:
  - 40% of patients were prescribed prandial insulin at baseline; this decreased to 31% at 3 months, then increased to 44% at 6 months
  - 16.7% were on an atypical antipsychotic and 10% were on a thyroid supplement

Conclusions

- Change in glycemic control based on increased TIR was statistically significant from baseline to 3 months in the overbasalized population
- Change in glycemic control based on decrease in HbA1c in the overbasalized population was not statistically significant
- Hypoglycemia was not observed in the overbasalized population

Discussion

- Prevalence of overbasalization observed higher than that reported in the literature but was not associated with hypoglycemia
- The incidence of overbasalization may be under reported due to follow-up data being available for approximately 2/3 of patients
- The change improvement in glycemic control was observed over time, but reductions in HbA1c and TIR were not sustained overtime
- Thyroid dysfunction likely did not contribute to lack of glycemic control as patients TSH levels were WNL

References

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