

Preoperative Diabetes and HbA1c as Predictors of Post-Colectomy Outcomes in Inflammatory Bowel Disease

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Introduction

- Inflammatory Bowel Disease (IBD), comprised of **ulcerative colitis and Crohn disease**, is among the most prevalent gastrointestinal disorders with rising incidence in recent decades.
- Given the chronic and progressive course of disease, surgical treatment is often employed for therapeutic and prophylactic purposes.
- Previous studies have linked diabetes with an increased risk for poor outcomes following colon surgery. In addition, within IBD, baseline malnutrition, steroid/biologic exposure, and sepsis risk compound vulnerability to adverse outcomes.
- HbA1c is the primary means of enumerating glucose control and offers a more sensitive indicator of health than diabetes status alone.
- A critical evaluation of both metabolic characteristics is warranted for the enhanced risk stratification, treatment planning, and continued care of IBD.

Study Objective

The objective of our study is to evaluate the impact of preoperative diabetes status as well as preoperative HbA1c levels on postoperative outcomes in patients undergoing colectomy for IBD, with an intention of isolating the combined predictive value of these metabolic risk factors.

Methods

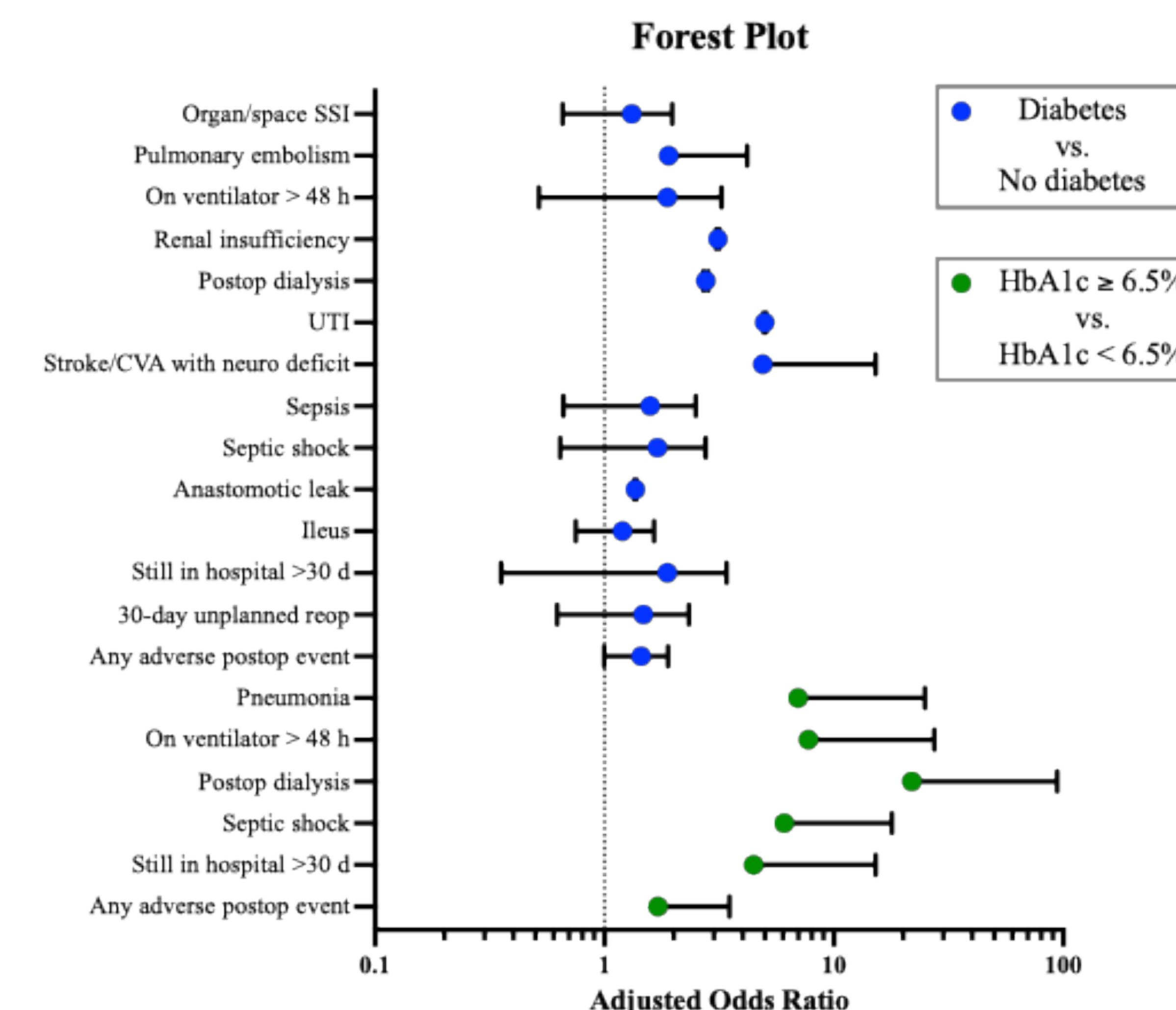
- We conducted a **7-year retrospective cohort analysis** with data extracted from the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) database.
- The study comprised of adult patients (age > 18) who underwent **colectomy** from 2017-2023 with the primary indication being **UC or Crohn's disease**.
- This resulted in **22,131 enrolled patients**, who were subsequently stratified by preoperative diabetes status and, for 2023 only, by HbA1c levels. HbA1c data was available for **603 patients**.
- Bivariate** regression analysis was conducted with two-tailed chi-square test for categorical variables and two-tailed t-test or ANOVA for continuous variables.
- Further, a **multivariate** regression analysis was conducted to control for the following potential confounding variables: **gender, age, race, and BMI**.
- All analyses were generated using the Statistical Analysis System (SAS) suite, and $p < 0.05$ was considered statistically significant.

Results

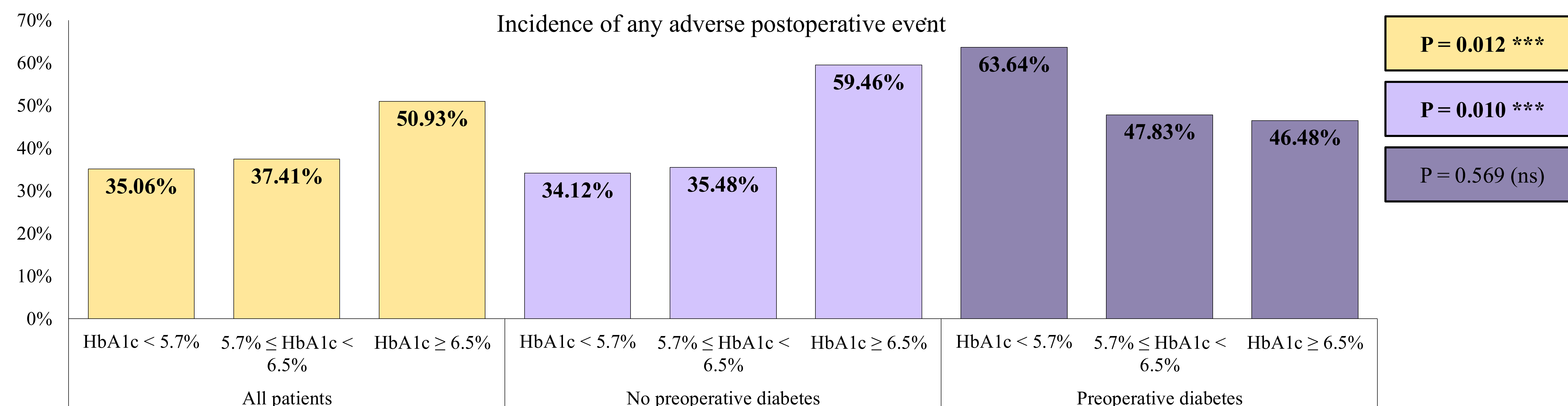
Baseline patient characteristics within study cohorts

Baseline Characteristics	Diabetes Cohorts			HbA1c Cohorts		
	Diabetes (n = 1,114)	No diabetes (n = 20,990)	P-value	HbA1c < 6.5% (n = 495)	HbA1c ≥ 6.5% (n = 108)	P-value
Gender (%)			ns			ns
Male	50.7%	49.5%		48.5%	53.7%	
Female	49.3%	50.5%		51.5%	46.3%	
Age	58.69 ± 13.88	42.60 ± 16.46	< 0.001	49.18 ± 17.21	57.54 ± 15.92	< 0.001
Race			ns			ns
White	73.36%	74.09%		67.47%	69.44%	
Black/African American	9.11%	8.27%		9.90%	12.96%	
Asian	2.02%	1.55%		3.03%	1.85%	
Pacific Islander/Native Hawaiian	0.00%	0.05%		0.40%	0.93%	
BMI (kg/m ²)	29.82 ± 7.94	25.08 ± 7.26	< 0.001	27.27 ± 7.31	29.31 ± 6.60	0.008
Currently on dialysis	1.75%	0.15%	< 0.001	0.20%	0.93%	ns
Current smoker within one year	17.09%	15.97%	ns	13.74%	17.59%	ns
Hypertension requiring medication	60.82%	15.75%	< 0.001	26.67%	48.15%	< 0.001
History of severe COPD	6.31%	1.64%	< 0.001	3.64%	7.41%	ns
Preoperative serum albumin (g/dL)	3.22 ± 0.87	3.49 ± 0.79	< 0.001	3.46 ± 0.78	3.18 ± 0.92	0.002

Impact of preoperative diabetes and HbA1c level



Combined impact of preoperative diabetes and HbA1c level



Conclusions

- Patients with diabetes and patients with high HbA1c levels that underwent colectomy for IBD exhibited independently greater odds of numerous complications.
- Even in patients **without diabetes**, high preoperative HbA1c levels predicted notably adverse outcomes. However, **in diabetic patients**, HbA1c was not found to indicate risk, prompting consideration into other metabolic or IBD-associated consequences not captured by glycemic control.
- These findings highlight that **not only diabetes status but also chronic disease management**, proxied by HbA1c levels, have a prognostic role in colectomies.
- Looking forward, preoperative glycemic status evaluation and proactive diabetes management for patients undergoing colectomy may help **predict and mitigate specific complications, inform care, and ultimately improve outcomes**.
- These findings are critical to accurately risk stratify surgical candidates preoperatively and emphasize the importance of both diabetes status and preoperative laboratory workup in tailoring treatments to reduce IBD-associated morbidity and mortality.
- Future studies can examine risk differences between specific IBD types as well as other key comorbidities associated with IBD such as low serum albumin and malnutrition.