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Long-Term Recurrence of Hypertension and Dyslipidemia after Roux-en-Y Gastric Bypass (RYGB) is Dependent on Race/Ethnicity: Trends Using a New Objective Metabolic Scoring System

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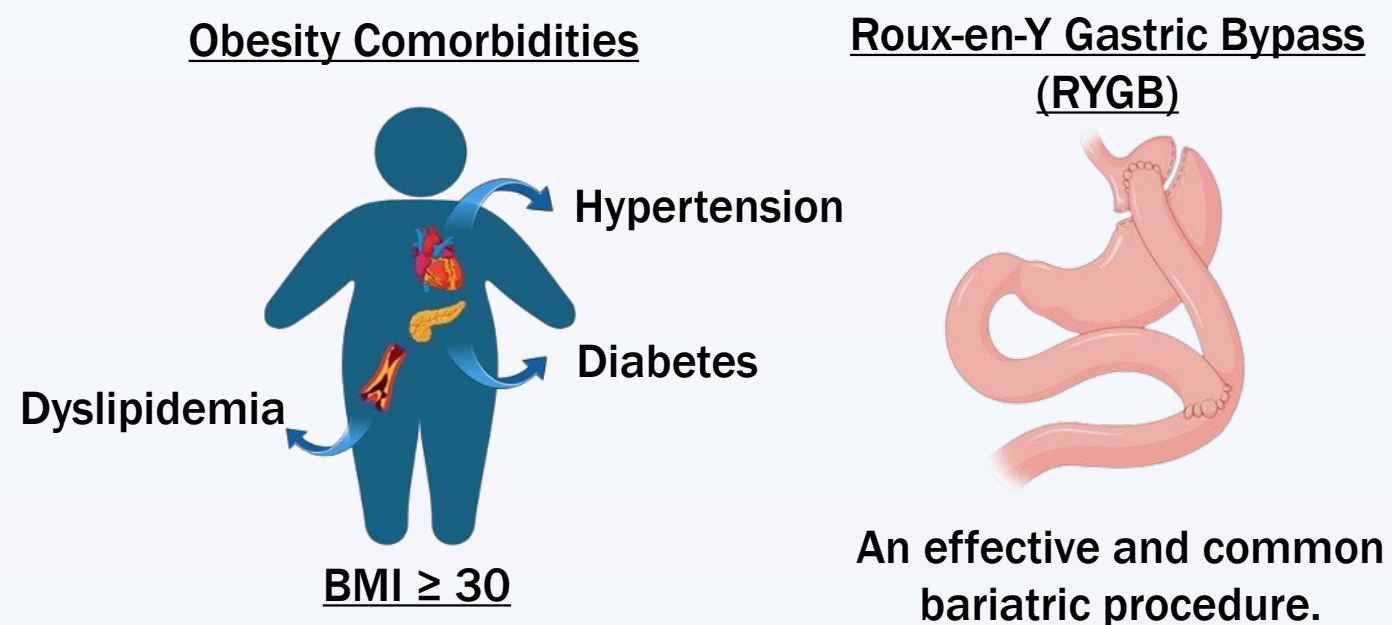
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INTRODUCTION

Obesity is associated with an increased risk for multiple metabolic comorbidities.¹ The most effective treatment for obesity and improvement of these comorbidities is bariatric surgery.^{2,3}



Limited data exists regarding the impact of race and socioeconomic characteristics on metabolic recovery following RYGB. We assessed the association between race/ethnicity and public/private insurance with metabolic response to RYGB.

METHODS

We created the Assessment of Obesity-related Metabolic Comorbidities (AOMC) scoring system to objectively assess metabolic disease severity on a 6-point scale using treatment and biochemical data (Table 1).⁴

AOMC scores were calculated for diabetes (DM), hypertension (HTN), and dyslipidemia (DYS) before and after RYGB surgery at 1-, 2-, and 5-year intervals for patients treated at our institution from 2012 to 2016.

AOMC trends were tested with Wilcoxon signed-rank test (pairwise) and the Jonckheere-Terpstra test (>2 groups).

AIM

Assess whether race and insurance type are associated with differences in long-term remission of obesity-related comorbidities following bariatric surgery, as measured by AOMC scores.

Table 1. Assessment of Obesity-related Metabolic Comorbidity (AOMC) Scores

Diabetes				
Score	FPG (mg/dl)	HbA1c (%)	Medications	Objective Definition
0	<100	<5.7	No	No history of DM
1	100-125	5.7-6.4	No	Pre-DM or DM controlled LSC
2	≥126	6.5-8.4	No	DM untreated or inadequately treated
3	-	<7.0	Single oral	DM controlled with medication
4	-	<7.0	Multiple or insulin	DM controlled with medications
5	-	≥7.0	All medications	DM not controlled with medications
	-	≥8.5	No	Severe DM untreated or inadequately treated

Hypertension				
Score	BP (mmHg)	Medications	Objective Definition	
0	<120/80	No	No pre-HTN or HTN	
1	120-139/80-89	No	Pre-HTN or HTN controlled with LSC	
2	140-159/90-99	No	HTN untreated or inadequately treated	
3	<140/90	<3 medications	HTN controlled with medications	
4	<140/90	≥3 medications	HTN controlled with medications	
5	≥140/90	All medications	HTN not controlled with medications	
	≥160/100	No	Severe HTN untreated or inadequately treated	

Dyslipidemia				
Score	LDL (mg/dl)	LDL* (mg/dl)	Medications	Objective Definition
0	<130	<100	No	No Pre-Dys or DYS
1	130-159	100-129	No	Pre-DYS or DYS controlled with LSC
2	160-189	130-159	No	DYS untreated or inadequately treated
3	<130	<100	Single	DYS controlled with medication
4	<130	<100	Multiple	DYS controlled with medications
5	≥130	≥100	All medications	DYS not controlled with medications
	≥190	≥160	No	Severe DYS untreated or inadequately treated

* LDL goals for patients with diabetes mellitus

RESULTS

Of 351 patients, 57% identified as non-Hispanic White, 13% Black, and 16% Hispanic. Race/ethnicity was significantly associated with private versus public insurance type or uninsured status (p<0.05, Table 2).

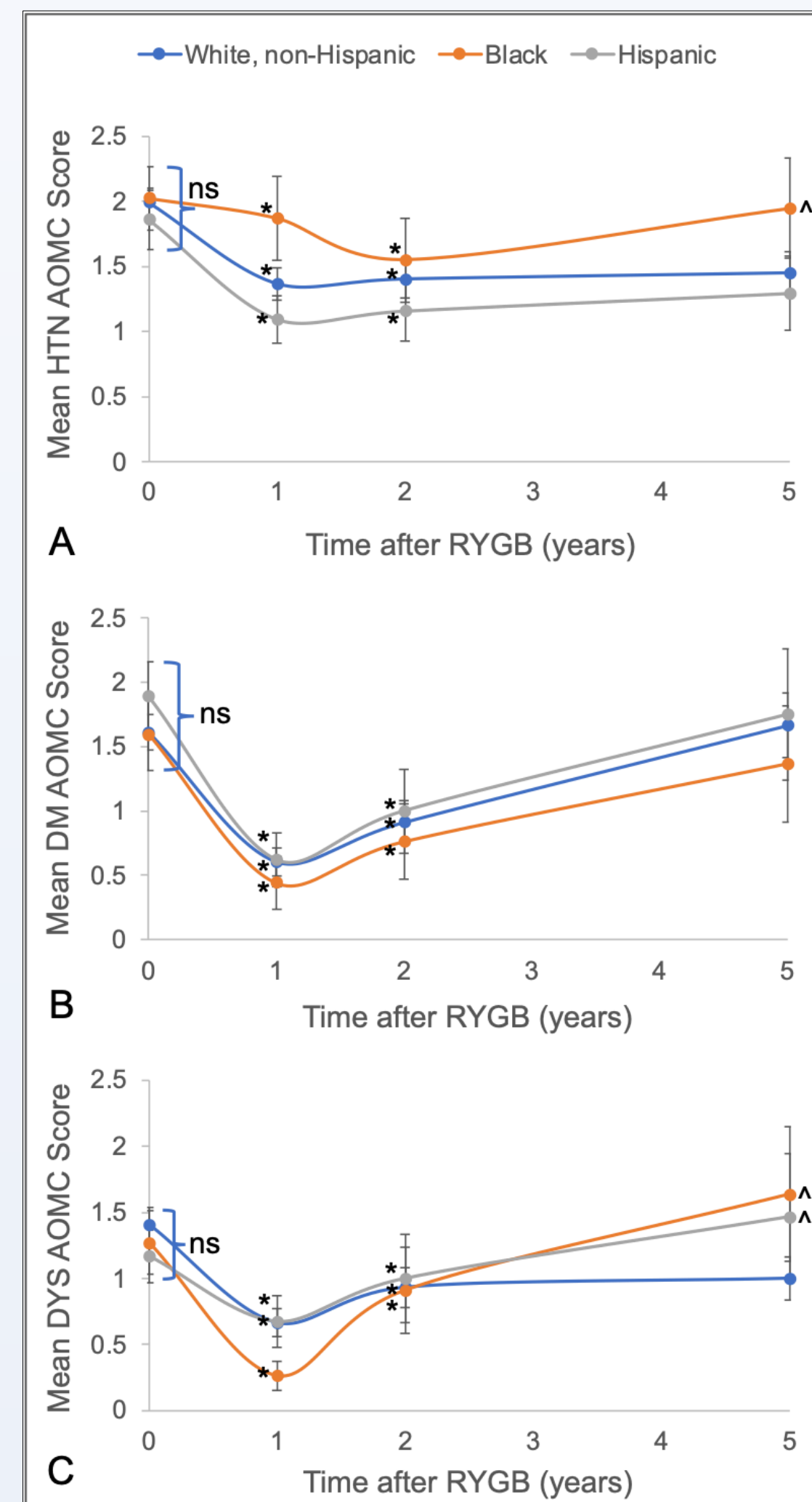
Preoperative AOMC scores did not differ among racial/ethnic groups for DM (p=0.25), HTN (p=0.38), or DYS (p=0.38).

Despite an equal degree of improvement of all scores at 1- and 2-years postoperatively in all groups, at 5 years, certain scores returned to baseline in Black patients (HTN and DYS) and Hispanic patients (DYS) (Figure).

Table 2. Preoperative Characteristics

	White, non-Hispanic	Black	Hispanic	Asian/Pacific Islander	Native American	Other	Unknown	p-value
Insurance Status								0.026*
Uninsured	42 (21.0%)	9 (20.0%)	11 (20.0%)	2 (28.6%)	1 (16.7%)	1 (20.0%)	17 (51.5%)	
Public	64 (32.0%)	10 (22.2%)	12 (21.8%)	0 (0.0%)	2 (33.3%)	2 (40.0%)	5 (15.2%)	
Private	94 (47.0%)	26 (57.8%)	32 (58.2%)	5 (71.4%)	3 (50.0%)	2 (40.0%)	11 (33.3%)	

Figure. Postoperative Changes in AOMC Scores by Race/Ethnicity. Preoperative AOMC scores were not different by race/ethnicity for HTN (A), DM (B), or DYS (C). All groups had significant decreases in AOMC scores at 1- and 2-years (p<0.05). Only Black patients had 5-year HTN and DYS scores return to baseline (A, C), and Hispanic patients had 5-year DYS scores return to baseline (C).



ns = non-significant
 * = p<0.05
 ^ = not significantly different from preoperative score

CONCLUSIONS

Racial/ethnic discrepancies in long-term durability of obesity-related comorbidity improvement exist and differ by metabolic disease.

Variability in insurance type among racial/ethnic groups may relate to treatment access and consequent metabolic disease control.

Such data can enhance patient education regarding the expectations for metabolic recovery following RYGB and signal the importance of adjuvant treatments to surgery in high-risk racial/ethnic groups.

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