Preoperative Hypoalbuminemia is Associated with an Increased Risk of Mortality in Patients with Super Obesity Undergoing Bariatric Surgery: Propensity Score Matching Analysis using the 2015-2022 MBSAQIP Database

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INTRODUCTION

Hypoalbuminemia has been associated with worse postoperative outcomes however there is limited data in the bariatric population. Our study aims to evaluate 30-day outcomes in patients undergoing primary sleeve gastrectomy (SG) or Roux-en-Y Gastric Bypass (RYGB) with albumin ≤ 3.5 versus > 3.5.

METHODS

Patients who underwent primary SG or RYGB within the MBSAQIP data registry from 2015-2022 were included in this study. Using Propensity Score Matching analysis, the cohorts were matched for 23 preoperative characteristics. We then performed four analyses comparing 30-day postoperative outcomes and bariatric-specific complications of patients with albumin ≤ 3.5 (hypoalbuminemia) versus > 3.5 when undergoing SG with BMI ≥ 50 (analysis 1), RYGB with BMI ≥ 50 (analysis 2), SG with BMI < 50 (analysis 3), and RYGB with BMI < 50 (analysis 4). In the matched cohorts, the majority of patients were caucasian females with an average age of 43, ASA of 3, and average BMI of 56 in the ≥ 50 group and 43 in the < 50 group. The most common comorbidity was hypertension in approximately half of all patients, followed by obstructive sleep apnea, GERD, and diabetes.

RESULTS

Figure 1: 30-day mortality by procedure and BMI group

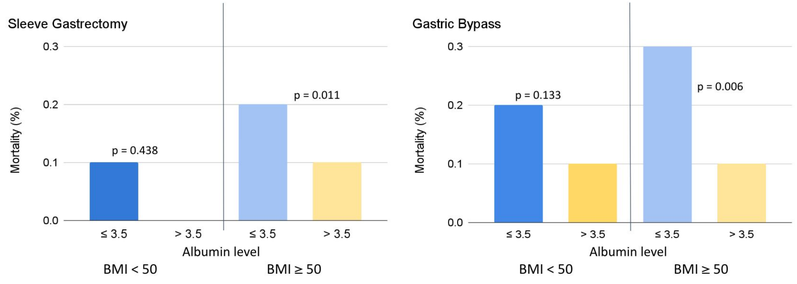


Table 1: 30-Day outcomes and bariatric specific complications in patients with and without hypoalbuminemia, super or morbid obesity undergoing SG or RYGB

	BMI < 50						BMI ≥ 50					
	SG			RYGB			SG			RYGB		
	≤ 3.5 (n = 16,025)	> 3.5 (n = 16,025)	p	≤ 3.5 (n = 6,787)	> 3.5 (n = 6,787)	p	≤ 3.5 (n = 17,548)	> 3.5 (n = 17,548)	p*	≤ 3.5 (n = 9,459)	> 3.5 (n = 9,459)	p
30-Day outcomes												
* Mortality	9 (0.1)	6 (0.0)	0.438	11 (0.2)	5 (0.1)	0.133	34 (0.2)	16 (0.1)	**0.011**	33 (0.3)	14 (0.1)	**0.006**
* Cardiac complications	6 (0.0)	8 (0.0)	0.593	10 (0.1)	6 (0.1)	0.317	16 (0.1)	12 (0.1)	0.450	23 (0.2)	9 (0.1)	**0.013**
* Pulmonary complications	29 (0.2)	13 (0.1)	**0.013**	20 (0.3)	16 (0.2)	0.504	46 (0.3)	31 (0.2)	0.087	49 (0.5)	23 (0.2)	**0.002**
* Renal complications	26 (0.2)	8 (0.0)	**0.002**	35 (0.5)	16 (0.2)	**0.008**	61 (0.3)	27 (0.2)	**<0.001**	58 (0.6)	20 (0.2)	**<0.001**
* Unplanned ICU admission	87 (0.5)	68 (0.4)	0.211	84 (1.2)	62 (0.9)	0.067	168 (1.0)	128 (0.7)	**0.020**	147 (1.6)	113 (1.2)	**0.034**
Blood transfusion	88 (0.5)	90 (0.6)	0.881	63 (0.9)	78 (1.1)	0.204	95 (0.5)	91 (0.5)	0.769	107 (1.1)	92 (1.0)	0.285
* Readmissions	511 (3.2)	399 (2.5)	**<0.001**	453 (6.7)	376 (5.5)	**0.006**	715 (4.1)	561 (3.2)	**<0.001**	606 (6.4)	553 (5.8)	0.108
Reoperations	148 (0.9)	126 (0.8)	0.182	145 (2.1)	150 (2.2)	0.769	161 (0.9)	146 (0.8)	0.390	193 (2.0)	222 (2.3)	0.150
* Interventions	151 (0.9)	98 (0.6)	**<0.001**	178 (2.6)	115 (1.7)	**<0.001**	161 (0.9)	159 (0.9)	0.911	252 (2.7)	172 (1.8)	**<0.001**
Emergency visits	999 (6.2)	994 (6.2)	0.908	611 (9.0)	653 (9.6)	0.215	1,218 (6.9)	1,155(6.6)	0.180	930 (9.8)	879 (9.3)	0.207
* Venous thromboembolism	67 (0.4)	46 (0.3)	**0.048**	28 (0.4)	23 (0.3)	0.483	88 (0.5)	54 (0.3)	**0.004**	62 (0.7)	33 (0.3)	**0.003**
Surgical site infection	8 (0.0)	2 (0.0)	0.058	23 (0.3)	12 (0.2)	0.063	12 (0.1)	10 (0.1)	0.670	27 (0.3)	20 (0.2)	0.307
Incisional hernia	4 (0.0)	2 (0.0)	0.687	3 (0.0)	5 (0.1)	0.479	5 (0.0)	8 (0.0)	0.424	17 (0.2)	11 (0.1)	0.256
Wound disruption	4 (0.0)	2 (0.0)	0.687	4 (0.1)	0 (0.0)	0.125	11 (0.1)	8 (0.0)	0.503	12 (0.1)	5 (0.1)	0.089
Sepsis or septic shock	-	-	-	-	-	-	-	-	-	2 (0.0)	0 (0.0)	0.500
Conversion to open	17 (0.1)	14 (0.1)	0.590	29 (0.4)	16 (0.2)	0.052	27 (0.2)	17 (0.1)	0.131	45 (0.5)	39 (0.4)	0.512
* Non-home discharge	48 (0.3)	35 (0.2)	0.153	34 (0.5)	29 (0.4)	0.528	137 (0.8)	79 (0.5)	**<0.001**	86 (0.9)	55 (0.6)	**0.009**
* Postoperative-LOS (days)	1.51 ± 1.18	1.42 ± 0.92	**<0.001**	1.90 ± 1.98	1.78 ± 1.47	0.063	1.64 ± 1.81	1.52 ± 1.35	**<0.001**	2.02 ± 2.07	1.93 ± 2.37	0.655
Operative Time (minutes)	65.99 ± 33.06	65.36 ± 33.98	0.153	116.03 ± 52.12	114.42 ± 52.28	0.058	72.34 ± 37.75	71.99 ± 36.37	0.217	124.66 ± 57.15	121.57 ± 55.12	**<0.001**
Bariatric-specific complications												
Staple line leak	40 (0.2)	29 (0.2)	0.185	25 (0.4)	19 (0.3)	0.365	46 (0.3)	42 (0.2)	0.669	35 (0.4)	25 (0.3)	0.196
* Postoperative bleeding	15 (0.1)	21 (0.1)	0.317	41 (0.6)	25 (0.4)	**0.048**	32 (0.2)	20 (0.1)	0.096	56 (0.6)	49 (0.5)	0.493
* Stricture/stomal obstruction	13 (0.1)	10 (0.1)	0.531	32 (0.5)	22 (0.3)	0.173	19 (0.1)	8 (0.0)	**0.034**	61 (0.6)	36 (0.4)	**0.011**
Intestinal obstruction	2 (0.0)	7 (0.0)	0.180	36 (0.5)	28 (0.4)	0.316	3 (0.0)	3 (0.0)	1.000	26 (0.3)	35 (0.4)	0.248
Internal hernia	3 (0.0)	2 (0.0)	1.000	6 (0.1)	9 (0.1)	0.438	6 (0.0)	5 (0.0)	0.763	6 (0.1)	8 (0.1)	0.593
* Gastrointestinal perforation	3 (0.0)	2 (0.0)	1.000	6 (0.1)	6 (0.1)	1.000	7 (0.0)	0 (0.0)	**0.016**	5 (0.1)	8 (0.1)	0.405
Anastomotic ulcer	1 (0.0)	0 (0.0)	1.000	20 (0.3)	17 (0.3)	0.621	2 (0.0)	0 (0.0)	0.500	30 (0.3)	22 (0.2)	0.267
Gallstone disease	13 (0.1)	17 (0.1)	0.473	3 (0.0)	7 (0.1)	0.344	21 (0.1)	18 (0.1)	0.631	14 (0.1)	19 (0.2)	0.384

Bold values represent significant differences defined as $p < 0.05$

CONCLUSION

Patients with hypoalbuminemia and super obesity undergoing bariatric surgery have a higher rate of complications and mortality. Nutritional optimization is strongly advised in patients with super obesity prior to undergoing bariatric surgery.