Postoperative Complications in a Super Morbidly Obese Population Undergoing TKA

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INTRODUCTION: The obesity epidemic in the United States has reached critical proportions, affecting over 35% of the adult population. Within this context, individuals with a body mass index (BMI) ≥50 kg/m², categorized as super-morbidly obese, have recently gained attention. As the fastest-growing segment of the obese population, these individuals have previously been identified as an exceptionally high-risk category of arthroplasty candidates. In this study, we aimed to further characterize the risks of 90-day complications following total knee arthroplasty amongst patients with a BMI ≥50 kg/m².

METHODS: Using the Premier Healthcare Database, patients who underwent primary elective TKA between 2015 and 2021 were identified. Patients with a BMI ≥50 were screened for inclusion and compared to patients with a BMI of 18-25. Patient demographics, comorbidities, and 90-day complications were compared between the BMI ≥50 and the BMI 18-25 groups. Chi-square and T-tests were used to evaluate for demographic and comorbidity differences, while univariate and multivariable regression analyses were utilized to assess 90-day complications.

RESULTS: In total, 3,376 patients with a BMI ≥50 who underwent primary elective TKA between 2015 and 2021 were identified. Compared to patients with a BMI of 18-25, super-morbidly obese patients were at an increased risk of medical, surgical, thromboembolic, and infectious complications within 90 days following TKA. Using multivariable logistic regression, the risk of periprosthetic joint infection (PJI) was 3.7 times greater in the supermorbidly obese population (adjusted odds ratio [aOR]: 3.70, 95%-CI: 2.14-6.39, p<0.001). The risk of pulmonary embolism (aOR: 2.24, 95%-CI: 1.01-4.96, p=0.047), myocardial infarction (aOR: 2.54, 95%-CI: 1.12-5.80, p=0.026), acute renal failure (aOR: 3.18, 95%-CI: 2.41-4.18, p<0.001), and acute respiratory failure (aOR: 4.08, 95%-CI: 2.74-6.07, p<0.001) were all similarly elevated within the supermorbidly obese cohort. Super-morbidly obese patients were more likely to be readmitted within 90 days compared to patients with a normal BMI (aOR: 1.47, 95%-CI: 1.16-1.87, p=0.001).

DISCUSSION: Super-morbidly obese patients have an increased risk of infectious, thromboembolic, medical, and surgical following TKA. With the increased risk of life-threatening complications such as PJI, myocardial infarction, and pulmonary embolism, our findings underscore the importance of pre-operative risk stratification and patient counseling in this cohort. Limitations of the present study include the retrospective study design and the low incidence of rare postoperative complications.

SIGNIFICANCE/CLINICAL RELEVANCE: Patients with a BMI ≥50 represent a rapidly increasing proportion of the arthroplasty patient population. This study adds to the growing body of literature characterizing the heightened risk of complications within this high-risk demographic and raises questions about the viability of surgical treatment, particularly TKA, within the super-morbidly obese population.

TABLE:

90-Day Postoperative Outcomes	BMI 18-25 (N= 17,659)		BMI>=50 (N=3,376)			Univariate Regression			Multivariate Regression		
	N	%	N	%		OR	P-Value	95%-CI	aOR	P-Value	95%-CI
Deep Vein Thrombosis	118	0.67%	17	0.50%	BMI 18-25 greater	0.75	0.274	.4518689 1.252593	0.85	0.589	.4710425 1.533795
Pulmonary Embolism	35	0.20%	14	0.41%	BMI 50 greater	2.10	**0.019**	1.126982 3.901365	2.24	**0.047**	1.00979 4.962864
Stroke	2	0.01%	4	0.12%	BMI 50 greater	0.95	0.926	.3275076 2.761391	1.17	0.829	.2838482 4.813067
Myocardial Infarction	37	0.21%	12	0.36%	BMI 50 greater	1.70	0.111	.8850176 3.261411	2.54	**0.026**	1.116306 5.797997
Acute Renal Failure	279	1.58%	168	4.98%	BMI 50 greater	3.26	**0.000**	2.684121 3.964963	3.18	**0.000**	2.414109 4.176543
Pneumonia	83	0.47%	18	0.53%	BMI 50 greater	1.14	1.135	.6809816 1.892048	1.28	0.445	.6797939 2.407492
Acute Respiratory Failure	102	0.58%	88	2.61%	BMI 50 greater	4.61	**0.000**	3.455471 6.141787	4.08	**0.000**	2.744498 6.07198
Urinary Tract Infection	347	1.97%	71	2.10%	BMI 50 greater	1.07	0.598	.8280582 1.387233	1.65	**0.002**	1.195172 2.265649
Hyperglycemia	72	0.41%	27	0.80%	BMI 50 greater	1.97	**0.003**	1.263426 3.069487	1.47	0.194	.8215348 2.641297
Wound Dehiscence	78	0.44%	37	1.10%	BMI 50 greater	2.50	**0.000**	1.686012 3.700053	2.30	**0.001**	1.381459 3.836295
Seroma	3	0.02%	4	0.12%	BMI 50 greater	6.98	**0.011**	1.561819 31.20729	2.52	0.367	.3389748 18.68968
Periprosthetic Joint Infection	57	0.32%	36	1.07%	BMI 50 greater	3.33	**0.000**	2.189381 5.060172	3.70	**0.000**	2.142934 6.394709
Any Postoperative Infection	51	0.29%	26	0.77%	BMI 50 greater	2.68	**0.000**	1.668487 4.303423	3.14	**0.000**	1.704268 5.76823
Sepsis	49	0.28%	14	0.41%	BMI 50 greater	1.50	0.184	.8253618 2.713589	1.52	0.274	.7169025 3.239051
Surgical Site Infection	16	0.09%	3	0.09%	Equal	0.98	0.975	.2856161 3.36769	0.83	0.813	.1836277 3.777394
Hospital Readmission	565	3.20%	136	4.03%	BMI 50 greater	1.27	**0.014**	1.049223 1.537129	1.47	**0.001**	1.162814 1.866247
Mortality	8	0.05%	3	0.09%	BMI 50 greater	1.96	0.320	.5203507 7.400693	3.22	0.188	.5657339 18.29597

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