Postoperative Complications in a Super Morbidly Obese Population Undergoing THA

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INTRODUCTION: Obesity is defined by the World Health Organization as having a body mass index (BMI) exceeding 30 kg/m^2. The American Association of Hip and Knee Surgeons (AAHKS) Workgroup issued evidence-based recommendations in 2013, concluding that obese patients faced notably higher risks of perioperative complications and recommended preoperative optimization in this patient population. Notably, the AAHKS Workgroup identified the super-morbid obesity (BMI >50 kg/m^2) patient as having a disproportionately increased risk of complications. The current study aimed to further define the relationship between super obesity and the incidence of postoperative infectious, thromboembolic, and medical complications following primary total hip arthroplasty.

METHODS: Patients who underwent primary elective THA between 2015 and 2021 were identified using the Premier Healthcare Database. Arthroplasty patients with a BMI ≥50 served were identified and compared to patients with a normal BMI of 18-25. Patient demographics and comorbidities were identified for both the BMI ≥50 and the BMI 18-25 groups. Our primary outcome was 90-day infectious, thromboembolic, and medical complications. Chi-square and T-tests were used to evaluate demographic and comorbidity differences, while univariate and multivariable regression was utilized to assess 90-day complications.

RESULTS: Between 2015 and 2021, 888 patients with a BMI ≥50 who had undergone primary elective THA were identified. The super-morbidly obese cohort had an increased risk of numerous medical, surgical, and infectious complications within 90 days following THA. Using multivariable logistic regression, it was found that super-morbidly obese patients had an elevated risk of infectious complications including PJI (adjusted odds ratio [aOR]: 7.23, 95%-CI: 3.95-13.24, p<0.001), sepsis (aOR: 4.24, 95%-CI: 2.19-9.23, p<0.001), surgical site infection (aOR: 14.47, 95%-CI: 6.04-34.64, p<0.001), urinary tract infection (aOR: 1.94, 95%-CI: 1.25-3.01, p<0.003), and any postoperative infection (aOR: 9.52, 95%-CI: 5.37-16.87, p<0.001). The risk of acute respiratory failure (aOR: 2.31, 95%-CI: 1.32-4.05, p=0.003), acute renal failure (aOR: 3.15, 95%-CI: 2.19-4.52, p<0.001), postoperative hyperglycemia (aOR: 2.28, 95%-CI: 1.17-4.43, p<0.016), and an increased risk of hospital readmission (aOR: 2.31, 95%-CI: 1.75-3.07, p<0.001) were all also elevated within the super-morbidly obese cohort.

DISCUSSION: There was an increased risk of infectious, thromboembolic, and medical complications following THA in the BMI ≥50 population. Our results demonstrate that this cohort is at a markedly increased risk of several adverse events, most notably, medical and infectious complications. In particular, patients with a BMI ≥50 were over 7-fold more likely to develop a PJI compared to patients with a normal BMI. Our findings emphasize the importance of preoperative risk stratification and patient counseling in this high-risk cohort. This study has several limitations, including the retrospective study design and an inherently low incidence of certain postoperative complications.

SIGNIFICANCE/CLINICAL RELEVANCE: As the obesity epidemic continues to grow, arthroplasty surgeons will see an increased number of patients with a BMI ≥50. This study has quantified the increased risk of complications facing patients with a BMI ≥50 undergoing THA, helping arthroplasty surgeons in preoperative risk-stratification and raising questions regarding the benefits of operative treatment within this population.

TABLE:

	BMI 18-25 (N= 20,147)		BMI>=50 (N=888)			Univariate Regression			Multivariate Regression		
90-Day Postoperative Outcomes	**N**	**%**	**N**	**%**		**OR**	**P-Value**	**95%-CI**	**aOR**	**P-Value**	**95%-CI**
Deep Vein Thrombosis	69	0.34%	5	0.56%	BMI 50 greater	1.65	0.282	.6630948 4.094357	1.49	0.425	.5604006 3.948324
Pulmonary Embolism	42	0.21%	7	0.79%	BMI 50 greater	3.80	**0.001**	1.703893 8.490074	4.32	**0.001**	1.752005 10.64042
Stroke	38	0.19%	1	0.11%	BMI 18-25 greater	0.60	0.610	.0818202 4.350172	0.71	0.743	.0921299 5.477464
Myocardial Infarction	37	0.18%	2	0.23%	BMI 50 greater	1.23	0.778	.2952382 5.09848	1.29	0.735	.2933442 5.684048
Acute Renal Failure	291	1.44%	50	5.63%	BMI 50 greater	4.07	**0.000**	2.992277 5.539208	3.15	**0.000**	2.188947 4.524533
Pneumonia	89	0.44%	6	0.68%	BMI 50 greater	1.53	0.313	.6689119 3.513978	1.03	0.954	.4217286 2.49919
Acute Respiratory Failure	121	0.60%	20	2.25%	BMI 50 greater	3.81	**0.000**	2.364543 6.150225	2.31	**0.003**	1.321778 4.049148
Urinary Tract Infection	356	1.77%	25	2.82%	BMI 50 greater	1.61	**0.023**	1.067481 2.429593	1.94	**0.003**	1.248356 3.00847
Hyperglycemia	79	0.39%	13	1.46%	BMI 50 greater	3.77	**0.000**	2.09101 6.811904	2.28	**0.016**	1.169187 4.431392
Wound Dehiscence	40	0.20%	16	1.80%	BMI 50 greater	9.22	**0.000**	5.145011 16.53466	7.61	**0.000**	3.897826 14.84962
Seroma	15	0.07%	8	0.90%	BMI 50 greater	12.20	**0.000**	5.159387 28.85414	11.50	**0.000**	4.397114 30.06204
Periprosthetic Joint Infection	44	0.22%	20	2.25%	BMI 50 greater	10.53	**0.000**	6.178422 17.93739	7.23	**0.000**	3.945035 13.24732
Any Postoperative Infection	47	0.23%	22	2.48%	BMI 50 greater	10.86	**0.000**	6.518413 18.10773	9.52	**0.000**	5.368676 16.87021
Sepsis	61	0.30%	14	1.58%	BMI 50 greater	5.27	**0.000**	2.939136 9.465441	4.24	**0.000**	2.187689 8.226
Surgical Site Infection	15	0.07%	11	1.24%	BMI 50 greater	16.83	**0.000**	7.70946 36.75813	14.47	**0.000**	6.043497 34.63631
Hospital Readmission	651	3.23%	68	7.66%	BMI 50 greater	2.48	**0.000**	1.916086 3.218875	2.31	**0.000**	1.745447 3.065095
Mortality	22	0.11%	2	0.23%	BMI 50 greater	2.06	0.327	.4848158 8.795128	3.56	0.119	.7214678 17.55795