

Introduction

Total joint arthroplasty (TJA) of the hip and knee are effective and cost-efficient procedures that help relieve symptoms, improve function, and restore quality of life in patients with severe, end-stage osteoarthritis and hence have been consistently among the most frequently performed procedures in the United States.

Obesity and metabolic syndrome (MetS) have been shown to be independent risk factors for adverse outcomes following TJA. There is a growing body of evidence suggesting that MetS is associated with adverse outcomes in TJA, including an increased risk of perioperative complications, prolonged hospital stays, and a higher rate of revision surgery¹.

Obesity has historically been associated with an array of TJA complications, though recent studies suggest that the role of obesity in TJA outcomes may not be as linear as once thought to be².

Although several studies have assessed the independent correlation of obesity or metabolic syndrome with respect to TJA outcomes, there is sparse literature that highlights the interplay between the two.

Aims and Objectives

1 Evaluate the combined impact of metabolic syndrome and obesity on immediate in-hospital outcomes and complications after TJA.

2 Analyze resource utilization among patients with obesity and metabolic syndrome.

Methods

A retrospective analysis was conducted using hospital discharge data from 2006 to the third quarter of 2015 from the National Inpatient Sample (NIS).

Patients who underwent a primary THA or primary TKA and were at least 40 years old were included in our study.

Once the TJA cohorts were identified, patients were further stratified into 2 groups: obese patients without a concomitant diagnosis of MetS and obese patients with a concomitant diagnosis of MetS.

MetS was defined based on diagnosis codes or having at least 3/5 components of metabolic syndrome: high blood pressure, obesity/BMI ≥ 30 , altered fasting glucose, low HDL cholesterol, and high triglycerides³.

Patient demographics, immediate hospital length of stay, disposition, and economic outcomes were compared using weighted cohorts.

The analysis of continuous and categorical data was conducted using t-tests and univariate logistic regressions, respectively. The statistical significance of the data was set at a P-value of 0.05.

Results

Patients with obesity and MetS had significantly higher rates of any complication and postoperative anemia. Additionally, they were significantly less likely to be discharged home versus a rehab facility compared with patients with obesity but without MetS.

Propensity Weighted Outcomes by MetS

Variable	MET_S1	NONMET_S1	P-Value
Length of Stay	(0.02)	(0.02)	0.3462
Any Complication	(25.98%)	(23.78%)	<.0001
Central Nervous System	(0.07%)	(0.09%)	0.1000
Cardiac	(0.65%)	(0.64%)	0.6866
DVT	(0.32%)	(0.36%)	0.0748
GI	(0.24%)	(0.25%)	0.3441
GU	(0.51%)	(0.49%)	0.5156
Hematoma/Seroma	(0.53%)	(0.57%)	0.1117
Discharge Home	(63.53%)	(65.81%)	<.0001
Postoperative Infection	(0.15%)	(0.17%)	0.1176
PE	(0.46%)	(0.49%)	0.1177
Postoperative Anemia	(24.16%)	(21.86%)	<.0001
Peripheral Vascular Disease	(0.10%)	(0.12%)	0.0586
Respiratory	(0.13%)	(0.15%)	0.1959
Wound Dehiscence	(0.11%)	(0.11%)	0.9873

In our study period, a total of 5,902,057 TKAs and 2,838,742 THAs were included in our database. For all TJAs (n= 8,740,799), 1,745,042 (19.96%) had a comorbid diagnosis of obesity, of which 757,901 (8.67%) of patients had a concomitant diagnosis of metabolic syndrome, and 985,141 (11.27%) of patients with obesity did not have a concomitant diagnosis of metabolic syndrome.

Conclusions

The prevalence of MetS is increasing globally, and it has become a major public health concern. **This study demonstrates that obese patients with MetS have significantly worse in-hospital outcomes than those without it.**

References

¹ Laperche, J., Feinn, R., Myrick, K. *et al.* Obesity and total joint arthroplasty: Does weight loss in the preoperative period improve perioperative outcomes?. *Arthroplasty* **4**, 47 (2022). doi:10.1186/s42836-022-00149-0

² Evans JT, Mouchti S, Blom AW, et al. Obesity and revision surgery, mortality, and patient-reported outcomes after primary knee replacement surgery in the National Joint Registry: A UK cohort study. *PLoS Med.* 2021;18(7):e1003704. Published 2021 Jul 16. doi:10.1371/journal.pmed.1003704

³ Ford ES, Giles WH, Dietz WH. Prevalence of the metabolic syndrome among US adults: findings from the third National Health and Nutrition Examination Survey. *JAMA.* 2002;287(3):356-359. doi:10.1001/jama.287.3.356

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