Malnutrition Does Not Limit the Effect of Preoperative Weight Loss Before Total Joint Arthroplasty

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INTRODUCTION: Malnutrition is paradoxically highly prevalent among patients with obesity undergoing total hip (THA) and knee (TKA) arthroplasty. Clinical guidelines recommend preoperative weight loss, but its benefits may be limited in malnourished patients by exacerbating nutritional deficiencies. The goals of this study were to determine if preoperative malnutrition and insulin resistance laboratory markers predict postoperative outcomes and limit the effect of preoperative weight loss.

METHODS: Among 21,038 primary THAs and 23,726 primary TKAs performed between 2002 and 2019, we identified 6128 patients with preoperative BMIs>30 kg/m^2 measured 1-24 months before surgery and a weight measured at surgery. Preoperative malnutrition and insulin resistance laboratory markers were reviewed. Malnutrition was defined as total lymphocyte count (TLC) <1500 cells/mm^3, albumin <3.5 g/dL, or transferrin <200 mg/dL, and insulin resistance as hemoglobin A1c $\geq$6.5%. The mean age was 67 years with 55% female. The mean BMI was 36 kg/m^2. Logistic and Cox regressions evaluated prosthetic joint infections (PJI), complications, revisions, and reoperations. Mean follow-up was 5 years.

RESULTS: Preoperative labs met criteria for malnutrition and insulin resistance in 38% and 26% of patients, respectively. Malnutrition overall and TLC were not significantly associated with PJI, complications, revisions, or reoperations. However, hypoalbuminemia increased the risk of reoperation (HR=1.5;p=0.035). Insulin resistance increased the risk of PJI (HR=2.5;p=0.003) and complications (HR=1.4;p=0.041) but was not significantly associated with revisions or reoperations. In multivariable analyses comparing losing ≥10 pounds to maintaining preoperative weight, malnutrition was not a significant effect modifier of PJI (HR=1.03;p=0.89), complication (HR=1.2;p=0.11), revision (HR=0.95;p=0.72), or reoperation (HR=1.1;p=0.25).

DISCUSSION AND CONCLUSION:

Malnutrition (38%) and insulin resistance (26%) were relatively common among patients with obesity undergoing primary THA and TKA. Preoperative screening may consider including albumin and insulin resistance, while TLC did not predict postoperative risks. Malnutrition did not significantly impact the effect of preoperative weight loss on postoperative outcomes.