

Confirming the Obesity Paradox in Hip Fractures: Short-Term Postoperative Outcomes*Stephen Belmustakov, BS; John Thompson, MD; Babar Shafiq, MD; Jose Flores, MPH;**Francis Abreu, MPH**Johns Hopkins Medicine, Baltimore, Maryland, USA*

Introduction: The obesity paradox describes an inverse epidemiological relationship between body mass index (BMI) and morbidity / mortality. Elevated BMI shows increased morbidity but decreased mortality in various populations. We sought to assess whether the obesity paradox extends to hip fractures in the short-term postoperative period and hypothesized that it would, with the goal of tailoring perioperative care to minimize complications in these subsets of patients.

Background/Purpose: The study consisted of 22,099 patients undergoing operative treatment for femoral neck and intertrochanteric fractures (OTA types 31-A/31-B; CPT codes 27235/27236/27244/27245) using the American College of Surgeons National Surgical Quality Improvement Program 2005-2013 databases. Patients were categorized based on World Health Organization body mass index (BMI) categories ranging from severe thinness (BMI <16) to severe obesity (BMI >40). After adjustment for various demographic and medical factors, logistic regression was used to predict the odds of 30-day postoperative morbidity / mortality, and ANOVA (analysis of variance) was used to compare length of stay (LOS) across BMI categories.

Results: The mean age was 79.3 (SD 11.9), and BMI (percentage) was distributed as severe thinness (1.99%), moderate thinness (2.10%), mild thinness (5.25%), normal (46.44%), overweight (28.36%), mild obesity (10.33%), moderate obesity (3.43%), and severe obesity (2.10%). When compared to normal BMI, severely thin and moderately thin patients had increased postoperative mortality (odds ratio [OR] 1.57, 95% Confidence Interval [CI] 1.10-2.24 and OR 1.89, 1.37-2.59, respectively) (Fig. 1). Mildly obese through severely obese patients had increased postoperative morbidity (OR 1.12, 0.91-1.39 and 1.42, 1.10-1.84, respectively) including wound infection ($P < 0.001$), failure to wean ventilation ($P < 0.001$), and postoperative renal impairment ($P < 0.001$). However, overweight and mildly obese patients had decreased mortality (OR 0.72, 0.62-0.84 and 0.76, 0.52-1.11, respectively) (Fig. 1). Median LOS for all categories was 5 days.

Conclusion: Patients with elevated BMI undergoing surgery for hip fractures have decreased mortality but increased morbidity rates in the short-term postoperative period. In contrast, patients with significantly decreased BMI experience increased mortality rates, thus confirming the obesity paradox. Surgical and medical providers should have heightened awareness of high and low BMI during perioperative care for acute hip fractures to identify at-risk patients with the goal of minimizing postoperative complications. Optimizing nutrition for severely and moderately thin individuals prior to surgery may help improve survival while focusing on wound care, judicious use of anesthesia, and hydration may reduce morbidity in patients with mild to severe obesity. Recognition of patient elements suggestive of a more complicated hospital course is crucial in an era of health-care reform and stricter physician and hospital reimbursements geared toward personalized care.

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.

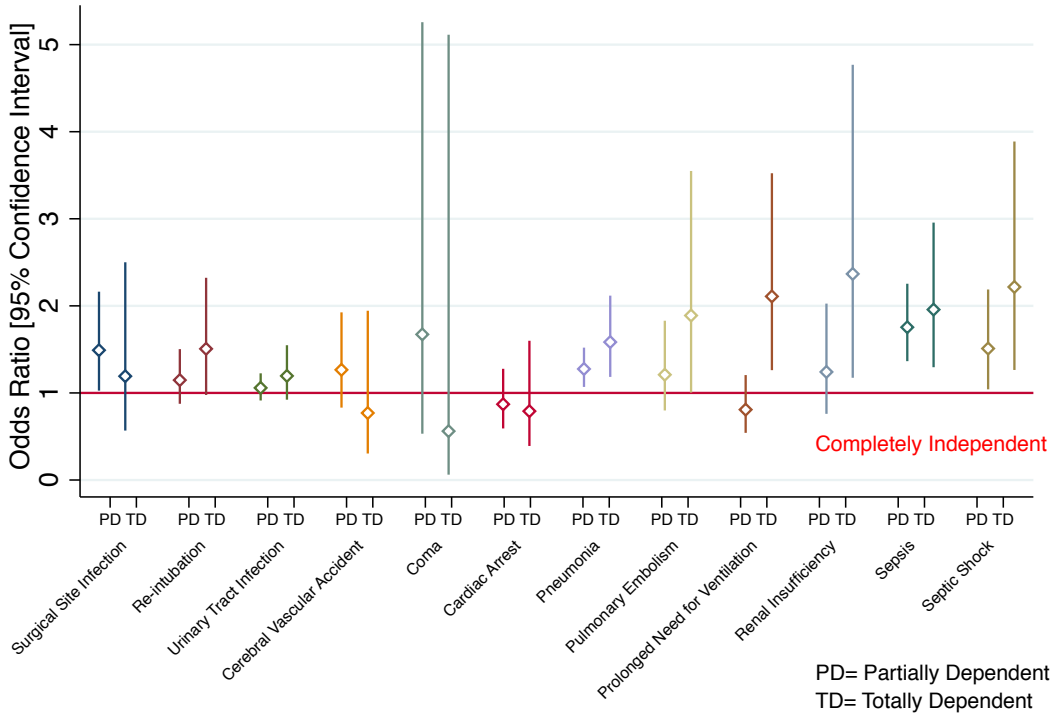


Figure 1: Odds Ratio for Post-operative Complications Associated with Impaired Functional Status. 12 post-operative complications were significantly associated with PD and TD, and after accounting for confounding variables 6 remained significantly associated with TD: pneumonia, prolonged ventilatory support, pulmonary embolism, renal insufficiency, sepsis, and septic shock.