Preoperative Testosterone Replacement Therapy is Associated with Increased Rates of PJI and Medical Complications after Total Shoulder Arthroplasty: A Propensity-Score Matched Analysis

Alexander E White, Argen Omurzakov, Arsen M Omurzakov, Christian Athanasian, Christopher Brusalis, Michelle Elizabeth Kew, Michael Fu, Lawrence V Gulotta, Samuel Arthur Taylor

INTRODUCTION:

The use of testosterone replacement therapy (TRT) has increased in recent years, however, its effect on surgical outcomes and long-term implant survival in total shoulder arthroplasty (TSA) remains unclear. This study aimed to assess the association between preoperative TRT and postoperative complications following TSA.

METHODS: The TriNetX database was queried to identify patients undergoing TSA before 2020. Patients were then stratified based on preoperative TRT within one year before surgery. Propensity score matching (PSM) was performed in a 1:1 ratio to balance demographic variables and comorbidities. Outcomes assessed included 90-day and 1-year medical and implant complications, as well as 5-year implant complications. Statistical analyses were performed using TriNetX's built-in analytics platform.

RESULTS:

Following PSM, 1,369 patients were included in each cohort and no baseline differences were detected. At 90 days postoperatively, TRT patients had higher rates of emergency department (ED) visits (13.7% vs. 8.1%, RR: 1.69, P<0.001), acute kidney injury (AKI) (8.3% vs. 6.2%, RR: 1.34, P = 0.033), and periprosthetic joint infection (PJI) (3.1% vs. 1.8%, RR: 1.68, P = 0.036). At 1 year, TRT patients demonstrated increased rates of ED utilization (26.6% vs. 16.9%, RR: 1.58, P<0.001), venous thromboembolism (7.0% vs. 4.5%, RR: 1.55, P = 0.005), AKI (17.5% vs. 12.1%, RR: 1.45, P<0.001), PJI (4.8% vs. 2.4%, RR: 2.00, P<0.001), and revision surgery (4.6% vs. 2.9%, RR: 1.58, P = 0.021). At 5 years, TRT was associated with increased rates of PJI (7.9% vs. 4.5%, RR: 1.74, P<0.001), implant loosening or mechanical failure (8.2% vs. 6.0%, RR: 1.37, P = 0.026), and revision surgery (8.4% vs. 5.8%, RR: 1.44, P = 0.009).

DISCUSSION AND CONCLUSION: Preoperative TRT is associated with an increased risk of postoperative medical and implant complications following TSA, including higher rates of PJI, AKI, VTE, and revision surgery. These findings highlight the need for careful preoperative risk assessment and patient counseling when considering TSA in patients on TRT.