

Risk of Complications After Total Hip Arthroplasty in Patients Under Testosterone Replacement Therapy

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INTRODUCTION:

Testosterone replacement therapy (TRT), used to treat hypogonadism, may cause side effects after orthopedic procedures. With hypogonadism and total hip arthroplasty (THA) on the rise, this study evaluates the relationship between TRT and postoperative complications in THA patients.

METHODS:

A retrospective review in a large academic hospital was conducted of hypogonadal patients treated with TRT, who underwent primary, elective THA between 2012 and 2024. These were 1:2 propensity-matched based on age, body-mass index, and comorbidities to a “control” group that was not treated with TRT. Patient and TRT characteristics including serum testosterone levels, form of administration, 90-day emergency department visit (ED) and readmissions, reoperations and revisions were explored.

RESULTS:

Among 164 patients aged 61.3 years who underwent THA with a 2.71-year follow-up, TRT was mainly administered intramuscularly (44.4%) or via transdermal gel (43.9%), following pellets (1.7%), transdermal patch and oral tablets (0.6%). TRT patients had significantly more 90-day ED visits and readmissions than the control group (1.82%vs.0.3%, $p=0.04$ and 0.006 , respectively), due to periprosthetic joint infection (PJI) (1.22%) and dislocation (0.61%). Reoperations and revisions were not different between the groups ($p=0.259$ and 0.705 , respectively), despite TRT patients having more than a fourfold increased risk of reoperation (1.22%vs.0.3%). TRT administration form was not associated with 90-day ED visits ($p=0.57$), readmissions ($p=0.7$), reoperations ($p=0.23$) or revisions ($p=0.48$). Testosterone level was negatively weak, yet significantly associated with 90-day ED visits ($r=-0.32$, $p=0.02$) and readmissions ($r=-0.29$, $p=0.04$), but not with reoperations or revisions ($p=0.21$ and 0.43 , respectively).

DISCUSSION AND CONCLUSION:

TRT in THA patients was associated with higher 90-day ED visits and readmissions, mainly from infections and dislocations. Administration form had no significant impact, while higher testosterone levels were linked to fewer 90-day ED visits and readmissions. Despite the known immunomodulatory effects of exogenous TRT, further investigation is warranted to guide perioperative management in hypogonadal THA patients.

Table 1. Patient demographics and features.

SD, standard deviation; n, number; %, percentage; BMI, body-mass index; ASA, American Society of Anesthesiologists; TRT, testosterone replacement therapy.

Parameter	TRT (n = 164)	Control (n = 328)
Mean age at surgery ± SD, (years)	61.3 ± 9.16	61.68 ± 12.02
Mean BMI ± SD, (km/m ²)	31.29 ± 5.55	31.49 ± 5.64
Race, n (%)		
White	131 (72.8)	232 (70.73)
Black or African American	15 (8.3)	40 (12.2)
Other	18 (10)	56 (17.07)
Smoking status, n (%)		
Never	68 (41.46)	154 (46.7)
Former	85 (51.82)	156 (47.3)
Current	11 (6.72)	18 (6)
ASA score, n (%)		
I	7 (4.26)	15 (4.57)
II	98 (59.75)	202 (61.58)
III	55 (33.53)	106 (32.31)
IV	4 (2.43)	5 (1.53)
Mean length of follow-up ± SD, (years)	2.71 ± 2.71	2.6 ± 2.53
Mean length of stay ± SD, (hours)	41.45 ± 37.05	26.94 ± 24.38
Mean testosterone value ± SD (ng/dL) (normal range: 300 – 1,000)	499.68 ± 414.54	
Form of TRT administration, n (%)		
Topical gel or cream	79 (43.9)	
Topical patch	1 (0.6)	
Intramuscular	80 (44.4)	
Pellets	3 (1.7)	
Oral tablets	1 (0.6)	

Table 2. Descriptive statistics of complications and revisions. n, number; TRT, testosterone replacement therapy; ED, emergency department; PPF, Periprosthetic fracture; DAIR, debridement, antibiotic, irrigation and implant retention.

Parameter	TRT (n = 164)	Control (n = 328)	Chi-squared test (p-value)
90-day ED visit, n (%)	14 (8.53)	11 (3.35)	0.014*
Surgery-related cause	3 (1.82)	1 (0.3)	0.04*
Infection	2 (1.22)	1 (0.3)	
Dislocation	1 (0.61)	0 (0)	
PPF	0 (0)	0 (0)	
Pain	0 (0)	0 (0)	
Non-orthopedic cause	11 (78.57)	10 (3.05)	
90-day readmission, n (%)	13 (7.92)	6 (1.83)	0.001*
Surgery-related cause	3 (1.83)	1 (0.3)	0.006*
Infection	2 (1.22)	1 (0.3)	
Dislocation	1 (0.61)	0 (0)	
PPF	0 (0)	0 (0)	
Aseptic loosening	0 (0)	0 (0)	
Non-orthopedic cause	10 (76.92)	5 (1.52)	
Reoperation, n (%)			
DAIR	2 (1.22)	1 (0.3)	0.259
Time to reoperation ± SD, (days)	31.5 ± 4.9	20	
Revision, n (%)	1 (0.61)	2 (0.6)	
Infection	1 (0.61)	1 (0.3)	0.705
Dislocation	0 (0)	0 (0.3)	
PPF	0 (0)	0 (0.3)	
Aseptic loosening	0 (0)	1 (0.3)	
Time to revision (days)	181	628 ± 732.56	