Can Hip Arthroplasty Surgeons Help Address the Osteoporosis Epidemic?

Amil Raj Agarwal, Alisa Malyavko, Alex Gu[1], Andrew Harris, Sandesh Rao, Robert S Sterling, Gregory Golladay[2], Savyasachi C Thakkar

[1]George Washington University School of Medicine An, [2]VCU Health

INTRODUCTION:

Osteoporosis is a known modifiable risk factor for periprosthetic fractures (PPF) following total hip arthroplasty (THA). Unfortunately, a high percentage of patients do not receive routine screening and treatment for osteoporosis, placing many at risk during THA. The purpose of this study was to determine 1) the prevalence of THA who meet criteria for osteoporosis screening, 2) the prevalence of those screened by DEXA testing, and 3) the 5-year cumulative incidence of both fragility fracture and periprosthetic fractures.

METHODS:

Patients without a prior diagnosis of osteoporosis who underwent primary elective THA from 2010 to 2021 were identified using a national database. Patients were stratified as either “high-risk” or “low-risk” for osteoporosis based on current guidelines. The prevalence of routine osteoporosis screening in high-risk patients via DEXA scan within 3 years was observed and the five-year cumulative incidence of PPF and fragility fracture was compared between the high-risk and low-risk cohorts.

RESULTS:

In total, 201,450 (53.0%) patients who underwent THA were considered high-risk for osteoporosis. Of the high-risk patients, 12.4% of patients received a preoperative DEXA scan. Within 5-years, high-risk THA patients had significantly higher cumulative incidence for fragility fractures (Hazard Ratio [HR] = 2.1; 95% Confidence Interval [CI]: 1.9-2.2; P<0.001) and PPF (HR = 1.7; 95% CI: 1.5-1.8; P<0.001) when compared to low-risk patients.

DISCUSSION AND CONCLUSION:

Our study showed a high prevalence of THA patients at risk for osteoporosis with a low prevalence of preoperative screening. The higher rates of fragility fractures and PPF in those at high-risk when compared to those at low-risk demonstrates the high likelihood of occult osteoporosis in those at high-risk. Preoperative osteoporosis screening and subsequent optimization by hip arthroplasty surgeons can both reduce osteoporosis-related fractures following THA as well as help address the osteoporosis epidemic.

FIGURE 1: 5-Year Cumulative Incidence of Fragility Fracture following Total Hip Arthroplasty

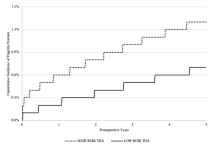

FIGURE 2: 5-Year Cumulative Incidence of Periprosthetic Fracture following Total Hip Arthroplasty

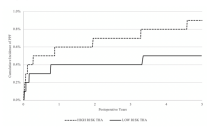

TABLE 1: Demographics and Comorbidities of Low-Risk and High-Risk Patients undergoing Total Hip Arthroplasty

	THA	
CATEGORY	**Number**	**Percent**
TOTAL	380,266	-
AGE	-	-
50-59	95,784	25.19%
60-69	148,248	38.99%
70-74	63,820	16.78%
75+	82,685	21.78%
SEX		
MEN	184,572	48.54%
WOMEN	195,694	51.46%
ANY HIGH RISK	201,450	52.98%
FEMALE 65 AND OLDER	115,203	30.30%
MALE 70 AND OLDER	66,089	17.38%
METABOLIC CONDITIONS	13,249	3.49%
SMOKER	10,598	2.79%
PRIOR FRAGILITY FRACTURE	4,757	1.25%
UNDERWEIGHT	3,678	0.97%
CHRONIC STEROID USAGE	2,622	0.69%
ALCOHOL ABUSE/DEPENDENCE	861	0.23%

TABLE 2: Prevalence of Osteoporosis Screening in High-Risk Patients within 3-Years of Total Hip Arthroplasty

	THA		
CATEGORIES			
-	Total	Number	Percent
ANY HIGH RISK	201,450	24,898	12.36%
CHRONIC STEROID USAGE	2,622	715	27.27%
FEMALE 65 AND OLDER	115,203	22,787	19.78%
UNDERWEIGHT	3,678	503	13.68%
SMOKER	10,598	874	8.25%
PRIOR FRAGILITY FRACTURE	4,757	348	7.32%
ALCOHOL ABUSE/DEPENDENCE	861	62	7.20%
METABOLIC CONDITIONS	13,269	527	3.97%
MALE 70 AND OLDER	66,089	1,542	2.33%

TABLE 3: Cox Proportional Hazard Ratio Analysis of Risk of Periprosthetic Fracture and Fragility Fracture within 5-years of Total Hip Arthroplasty

CATEGORY	**HR**	**95% CI**	**P-VALUE**
PPF	1.66	1.52-1.81	<0.001
FF	2.06	1.90-2.24	<0.001