

Tyler Thorne, Samantha Andrews, Scott Nishioka, Cass Nakasone

Abstract Title: Racial and Ethnic Disparities in Utilization Rate and Perioperative Outcomes after Knee and Hip Arthroplasty

Objective

Previous racial disparity evaluations of total hip (THA), total knee (TKA), and unicompartmental knee arthroplasties (UKA) have focused on black and white populations. The current study reports the utilization and perioperative complications in Hawaii's population of majority Asians, with subpopulations of Whites, Native Hawaiian/Pacific-Islander (NHPI) and Blacks.

Methods

Data were retrospectively collected from 3304 arthroplasties performed from 2011 to 2019 and compared across four major ethnic groups.

Results

Racial groups included 1789 (52.2%) Asians, 1164 (34%) Whites, 320 (9.3%) NHPI and 31 (0.9%) Blacks. Medicare was the most common insurance type for Asians (66.2%) and Whites (54.2%), while private insurance was most common for NHPI (49.4%) and Blacks (54.8%). Asians had the 2nd highest percentage of patients living in urban zip codes (Asian: 84.7%, Whites: 69%, NHPI: 69.8%, Black: 87.1% $p<0.001$), were significantly older (Asian: 69.7; White: 66.7; NHPI: 64.0; Black: 59.7; $p<0.001$), had significantly lower body mass index (Asian: 27.9; White: 28.8; NHPI: 33.0; Black: 34.3; $p<0.001$) and had the greatest percentage of patients with impaired fasting glucose (Asian: 46.8%; Whites: 26.2%; NHPI: 46.6%; Black: 40.0%; $p<0.001$). Normalized to total Hawaii population and racial percentage, compared to Asians, Whites were more likely to have a higher economic status while NHPI were more likely to have lower status (Odds Ratio (OR) White: 0.695, 95% Confidence Interval (CI):0.576-0.837, $p<0.001$; OR NHPI: 1.456, CI: 1.117-1.898, $p=0.005$). From 2011 to 2019, male arthroplasty utilization rates increased 0.14 (Asian), 0.07 (White) and 0.24 (NHPI) arthroplasties per 1000 persons and female utilization rates changed 0.08 (Asian), -0.01 (White) and 0.14 (NHPI) arthroplasties per 1000 persons. Compared to Asians, Whites more often underwent THA compared to TKA/UKA (OR: 1.755, CI: 1.532-2.009; $p<0.001$). Compared to Asians, Whites and NHPI more often underwent TKA over UKA (White: OR: 1.499, CI: 1.204-1.866; NHPI: OR: 2.013, CI: 1.402-2.887; $p<0.001$). From 2012-2015 Asians utilization rates of TKA ranged from 53.8%- 62.4% but dropped to 30.9%-37.9% following the introduction of the UKA procedure in 2016 which was utilized in 27.6%-32.7% of patients from 2016 to 2019. After controlling for bilateral procedures, only NHPI had a lower risk of transfusion compared to Asians (OR: 0.478, CI: 0.266-0.860; $p=0.014$). Only Whites had increased risk of wound or systemic complications compared to Asians (OR: 2.086, CI: 1.242-3.503, $p=0.005$). No complications were associated with urban vs rural living area, while a higher risk of transfusion was associated lower socioeconomic status (OR: 1.541; CI 1.155-2.055, $p=0.003$). There was no difference between racial groups and length of stay in unilateral knee replacements but Whites had increased length of stay at 2.66 days compared to Asians at 2.19 days ($p=0.005$) following bilateral procedures.

Discussion

Minority racial groups in Hawaii have equal utilization of joint arthroplasty and, despite rural living status, lower socioeconomic status, and greater comorbidities, had no increased rates of peri-operative complications. While these results contradict previous research, the utilization rates present in the current study suggest adequate patient access to healthcare across the State and sufficient protocols to avoid post-operative complications.