

Total Hip Arthroplasty in Nonagenarians: A National In-Patient Sample-Based Study of Perioperative Complications

Nikit Venishetty¹, Michel Toutoungy, Jack Beale, Jack Riley Martinez, Dane K Wukich, Varatharaj Mounasamy, Michael H Huo², Senthil Nathan Sambandam³

¹Paul L. Foster School of Medicine, Texas Tech Heal, ²UT Southwestern Medical Center, ³VA Medical Center

INTRODUCTION:

There are limited health statistics available for the rapidly expanding population aged 90 years or more (nonagenarians) in the United States (US). It is estimated that by 2050, nonagenarians will account for approximately 71 million of the world's population. It is anticipated that the prevalence of hip arthritis and the need for total hip arthroplasty (THA) will continue to increase in this age group. Total hip arthroplasty is a proven successful procedure to improve the quality of life and functional capacity in patients with hip arthritis. Globally, there are more than one million THAs performed each year.

While THA is beneficial for many nonagenarian patients, associated medical comorbidities potentially can lead to higher rates of perioperative complications. A previous study reported on the outcomes of primary THAs from 2010-2014 found that the nonagenarians had higher rates of transfusions, urinary tract infection, acute kidney injury, longer hospital stays, and higher hospital charges compared to the octogenarians. The authors did not report data on surgical complications such as surgical site infection, periprosthetic fracture, or dislocation. Additionally, there is a higher in-hospital mortality rate in nonagenarian patients due to medical comorbidities and complications. Moreover, after non-cardiac and non-trauma-related surgeries, nonagenarians have an increase in postoperative mortality rates.

Other studies have reported THA and total knee arthroplasty (TKA) in this population are associated with increased hospital costs, increased length of stay (LOS), and higher complication rates. The purpose of this study was to query a large patient database (the Nationwide Inpatient Sample (NIS) Database) to evaluate the patient characteristics, demographics, and incidence of postoperative complications among nonagenarian patients who underwent primary THAs. We hypothesize that the nonagenarians will have higher rates of perioperative complications, longer hospitalization, and higher costs associated with their care. To our knowledge, this is the first study that has studied perioperative complications, charges associated with healthcare costs, demographic variables, and patient admission characteristics using a large database such as the NIS.

METHODS: In this retrospective study, we used the Nationwide Inpatient Sample (NIS) database from 2016-2019 to analyze the incidence of perioperative complications, length of stay (LOS), and the cost of care (COC) among patients undergoing THAs who were categorized as nonagenarians, and those who were not.

RESULTS: The NIS database identified 309,100 patients who underwent THAs from 2016-2019. Of those, 1,864 patients (0.6%) were nonagenarian, while the remaining 307,236 patients were included under the non-nonagenarian category (control). The mean age in the nonagenarian group was 90 years compared to the control group which had a mean age of 65.8 years. There was an increased incidence of mortality rate (nonagenarian group 0.2%, control group 0.03%, $P < 0.001$), myocardial infarction (nonagenarian group 0.1%, control group 0.02%, $P = 0.01$), acute renal failure (nonagenarian group 5.4%, control group 1.6%, $P < 0.001$), blood anemia postoperatively (nonagenarian group 28.9%, control group 17.2%, $P < 0.001$), and deep vein thrombosis (nonagenarian group 0.48%, control group 0.07%, $P < 0.001$) in the nonagenarian group. The COC for the nonagenarian group was higher than that in the control group ($P < 0.001$). The mean LOS was longer in the nonagenarian group (3.1 days) in comparison to the control group (1.96 days) ($P < 0.001$).

DISCUSSION AND CONCLUSION: Nonagenarians had significantly higher rates of both orthopaedics and medical complications than the younger patients undergoing THAs. In addition, the nonagenarian group incurred higher COC.

This large database study found that nonagenarians have higher rates of perioperative complications following primary THA than patients less than 90 years of age. Despite the higher complication rate, more than 99% of patients survived the hospitalization, and the periprosthetic complication rate of fracture, dislocation, and infection was individually less than 1%. This study provides data to patients, providers, and healthcare organizations regarding the perioperative outcomes of primary THA in nonagenarians. Preoperative optimization and perioperative multidisciplinary management of these patients potentially can allow nonagenarians to safely undergo primary THA, albeit with higher complication rates compared to younger patients. In this age group, the increased rate of perioperative complications should be considered when estimating hospital costs.