The influence of ethnicity/race and sex on lumbar spinal fusion outcomes

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Introduction/Background

- Fusion for the lumbar spine is among the most common orthopaedic procedures performed
- While substantial data exists on factors that influence surgical outcomes, there are few studies that investigate the impact of demographics on postoperative complication rates
- The purpose of this study was to assess if there are differences in outcomes following lumbar spinal fusion between males and females and between different racial groups

Materials and Methods

- A retrospective cohort study was conducted using the National Inpatient Sample (NIS) 2016 database, which contained 35,967 patients who underwent lumbar spinal fusion surgery as their primary procedure using ICD-10 codes
- Complications assessed included death, prolonged length of stay (LOS) > 4 days, surgical site infection, urinary tract infection (UTI), urinary retention, pneumonia, deep vein thrombosis/thrombophlebitis, pulmonary embolism, renal insufficiency/failure, cardiac arrest, neurologic injury, and postoperative anemia
- Statistical analysis was conducted in R. One-way ANOVA followed by Tukey’s multiple comparison was performed to analyze differences in complication rates between races. Odds ratios and Fisher’s exact test were used to assess complication differences between sexes

Results

- There was a significant difference in inpatient postoperative mortality between male and female sex following lumbar spinal fusion
- Females had a significantly lower chance of death (OR: 0.339, 95% CI: 0.170, 0.635, p < 0.001).
- Females also had lower chance of urinary retention (OR: 0.511, 95% CI: 0.463, 0.564, p < 0.001), surgical site infection (OR: 0.747, 95% CI: 0.583, 0.957, p < 0.01), renal insufficiency/failure (OR: 0.638, 95% CI: 0.450, 0.900, p < 0.01), and cardiac arrest (OR: 0.385, 95% CI: 0.341, 0.434, p < 0.001).
- Females were found to have a higher risk of prolonged LOS (OR: 1.108, 95% CI: 1.053, 1.166, p < 0.0001), UTI (OR: 2.189, 95% CI: 1.856, 2.593, p < 0.001), neurologic injury (OR: 1.092, 95% CI: 1.033, 1.155, p < 0.01), and postoperative anemia (OR: 1.477, 95% CI: 1.388, 1.572, p < 0.001).
- No differences were found in cardiac arrest, pulmonary embolism, UTI, or death rates following lumbar fusion between races.
- Compared to black, Asian, and Hispanic patients, white patients were less likely to have a prolonged LOS (p < 0.05).
- White patients were also significantly less likely to have infections than black patients (p < 0.001) and less likely to have renal complications than blacks or Asians (p < 0.01).
- Postoperative anemia was significantly higher in Asians compared to Hispanics and whites (p < 0.05).

Discussion/Conclusions

- There are multiple significant differences in complication rates following lumbar spinal fusion between different sexes and races
- These demographic factors should not be overlooked during preoperative assessments and should be taken into consideration when educating patients on surgical risks.
- More work is needed to identify confounding factors and the exact etiologies for the differences in complication rates between gender and racial groups

Future Studies

- Future work should control for confounding by using propensity score matching or multivariable analysis to achieve more clinically translatable data
- Risk stratification and pre-, intra-, and postoperative monitoring may be influenced by future findings on how race/ethnicity and sex relate to postoperative outcomes

Disclosures

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