Obesity in spinal surgery

Obesity is a global health challenge that affects a large proportion of adults worldwide. Obesity and frailty pose considerable health risks due to their potential to interact and amplify one another's negative effects.

Owodunni et al. sought to compare the discriminatory thresholds of the risk analysis index (RAI), 5-factor modified frailty index (m-FI-5) and patient age for the primary endpoint of postoperative mortality.

Subjects/methods: We included spine surgery patients ≥18 years old, from the American College of Surgeons National Quality Improvement program database from 2012-2020, that were classified as obese. We performed receiver operating characteristic curve analysis to compare the discrimination threshold of RAI, mFI-5, and patient age for postoperative mortality. Proportional hazards risk-adjusted regressions were performed, and Hazard ratios and corresponding 95% Confidence intervals (CI) are reported.

Overall, there were 149 163 patients evaluated, and in the ROC analysis for postoperative mortality, RAI showed superior discrimination C-statistic 0.793 (95%CI: 0.773-0.813), compared to mFI-5 C-statistic 0.671 (95%CI 0.650-0.691), and patient age C-statistic 0.686 (95%CI 0.666-0.707). Risk-adjusted analyses were performed, and the RAI had a stepwise increasing effect size across frailty strata: typical patients HR 2.55 (95%CI 2.03-3.19), frail patients HR 3.48 (95%CI 2.49-4.86), and very frail patients HR 4.90 (95%CI 2.87-8.37). We found increasing postoperative mortality effect sizes within Clavein-Dindo complication strata, consistent across obesity categories, exponentially increasing with frailty, and multiplicatively enhanced within CD, frailty and obesity strata.

In this study of 149 163 patients classified as obese and undergoing spine procedures in an international prospective surgical database, the RAI demonstrated superior discrimination compared to the mFI-5 and patient age in predicting postoperative mortality risk. The deleterious effects of frailty and obesity were synergistic as their combined effect predicted worse outcomes [1].

Some meta-analyses have confirmed an increase of complications following lumbar spine surgery (mainly infections and venous thrombosis) in obese subjects. However, functional outcomes after lumbar spine surgery are favorable although inferior to the non-obese population, acknowledging that obese patients present with worse baseline function levels and the prognosis of conservatively treated obese cohorts is much worse. The impact of preoperative weight loss in spine surgery has not been prospectively studied in these patients [2].

In the USA, obesity rates have significantly increased since 2000. Mirroring this trend, a large proportion of patients undergoing spinal surgery are obese.

Sciatica

Findings consistently showed that both overweight and obesity are risk factors for lumbar radicular pain and sciatica in men and women, with a dose-response relationship [3].

see Lumbar discectomy in obesity

Studies have shown associations between body mass index (BMI) and perioperative complications in lumbar and thoracolumbar fusion surgeries; however, few studies have evaluated the impact of obesity on anterior cervical fusion surgery [4].

Obese patients undergoing lumbar fusion had higher blood loss, longer lengths of stay, higher complication rates, and worse functional outcomes at the last follow-up than nonobese patients. These findings suggest that both surgeons and patients should acknowledge the significantly increased morbidity profile of obese patients after lumbar fusion [5].

Obesity was not associated with less improvement in patient-reported outcomes (PROs) following anterior cervical discectomy and fusion (ACDF). There was no difference in the proportion of patients satisfied with surgery and those achieving a minimal clinically important difference across all PROs. Obese patients may therefore achieve meaningful improvement following elective ACDF [6].

1)
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