

Impact of Serotonergic Modulators on Short- and Long-Term Outcomes After Transforaminal Lumbar Interbody Fusion

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Introduction

Selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs) are widely prescribed and may influence perioperative bleeding risk and fusion biology. This study evaluated the association between preoperative SSRI/SNRI use and postoperative outcomes following transforaminal lumbar interbody fusion (TLIF).

Materials and Methods

A retrospective propensity score-matched cohort study was conducted using a multi-institutional electronic medical record database. Adult patients undergoing single- or multi-level TLIF between 2004 and 2024 were identified using CPT codes 22633 and 22634. The exposure group included patients prescribed SSRIs/SNRIs within two years before surgery. Exclusion criteria included infection, malignancy, inflammatory bone disease, prior TLIF/ALIF, and documented pseudoarthrosis. Matching (1:1) was performed across demographics and >300 comorbidities. Outcomes were assessed at 30, 90 days, and 2-, and 5-year intervals using chi-squared tests, t-tests, and Kaplan-Meier survival estimates.

Results

After matching, 7,268 single-level and 2,193 multi-level TLIF patients were included in each cohort. At 30 and 90 days, SSRI/SNRI use was associated with significantly higher rates of postoperative infection, incision and drainage, and opioid utilization in both surgical groups (all $P < 0.05$). Single-level SSRI/SNRI users additionally demonstrated higher rates of pneumonia and transfusion, while multi-level users showed increased dehiscence and emergency department utilization. At one year, single-level SSRI/SNRI use was associated with higher pseudoarthrosis and adjacent segment disease. Multi-level SSRI/SNRI users had increased cervical fusion procedures and reoperations. At five years, both cohorts demonstrated significantly elevated pseudoarthrosis rates, with multi-level patients also showing increased cervical fusion and overall reoperation.

Conclusion

Preoperative SSRI/SNRI use is independently associated with increased short-term complications and higher long-term risks of pseudoarthrosis and reoperation following TLIF, underscoring the importance of incorporating antidepressant exposure into perioperative risk assessment.