

Impact of the Social Vulnerability Index on Procedure Type and Outcomes After Cervical Myelopathy Surgery

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INTRODUCTION:

The Social Vulnerability Index (SVI), a CDC-developed measure based on four subgroups composed of 16 U.S. Census variables, identifies communities more susceptible to public health emergencies. Previous studies have linked higher SVI scores with worse postoperative outcomes across various surgical disciplines, yet limited research exists for cervical myelopathy outcomes specifically.

Objective:

Examine the association between social vulnerability, via SVI scores, with patients undergoing cervical myelopathy surgery and their postoperative outcomes.

METHODS: A retrospective analysis was conducted on 1260 patients who underwent cervical spine surgery for cervical myelopathy between 2013-2024. Demographic, comorbidities, clinical, and postoperative outcome data were collected, alongside patient-specific SVI scores. Comorbidities, procedure type, and outcome measures (postoperative complications, readmissions, and reoperations within 30 days of surgery) were assessed for correlation with the overall SVI score and its four subgroups.

RESULTS: Greater socioeconomic status (SES) vulnerability was associated with lower odds of undergoing laminectomy, posterior decompression, and fusion extension revision, but higher odds of corpectomy. Greater household characteristics vulnerability was also associated with reduced odds of laminectomy and fusion extension revision, but increased odds of corpectomy. Similarly, greater housing and transportation vulnerability was linked to lower odds of laminectomy, yet higher odds of stroke comorbidity. Racial/ethnic minority status was associated with decreased odds of undergoing multiple surgeries and increased odds of hypertension. Regarding overall social vulnerability, patients in SVI Quartile 4 (Highest vulnerability) had significantly lower odds of receiving a laminectomy compared to those in Quartile 1 (Lowest vulnerability).

DISCUSSION AND CONCLUSION: Higher social vulnerability, particularly in socioeconomic status and housing/transportation subgroups, was associated with lower odds of receiving laminectomy and needing a fusion extension revision. Conversely, higher household and SES vulnerability was linked to increased odds of undergoing corpectomy. These findings highlight the importance of SVI and its subgroups in the surgical management of cervical myelopathy and postoperative outcomes.