Trends in management of central cord syndrome: The Role of Area Deprivation Index

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INTRODUCTION:

Central Cord Syndrome (CCS) is the most common form of incomplete traumatic spinal cord injury, frequently resulting from hyperextension of the cervical spine. There is conflicting evidence in the literature regarding optimal treatment for this diagnosis. Here, we aim to identify patient factors that are associated with decisions for surgical management versus non-surgical management of CCS, and compared length of stay (LOS), patient discharge status, readmission within 90 days after discharge, complications within 90 days after discharge, mortality within 30 days after discharge, and total charge between patient groups and between surgical modalities. We aim specifically to investigate the role of area deprivation index (ADI) on these outcomes.

METHODS:

The New York Statewide Planning and Research Cooperative System (SPARCS) inpatient database was reviewed to identify all patients diagnosed with CCS between January 1st, 2012, and December 31st, 2021. Patients with CCS, and surgical modalities, were identified using ICD-9 and ICD-10 codes. From these patients, demographics and ADI were collected. ADI is a composite measure of 17 census variables that describe socioeconomic disadvantage based on area code. Chi-square, T-test, and multivariable regression analysis were used to compare outcome variables noted previously. All multivariate models include a random intercept and random effects for facility. $P < .05$ was considered significant.

RESULTS:

Of the 2214 records that met our criteria, 93.36% of patients were older than 65. 73.85% of patients were male, and 60.25% identified as white. 40.83% of patients had private insurance as their primary payor, and 72.31% had an emergency admission status. 40.24% of patients were treated surgically (Table 1A). Patients with a higher ADI were shown to trend towards a lower LOS, 90-day readmission and complication rate, lower 30-day mortality, lower costs, and lower likelihood of receiving surgery versus their lower ADI counterparts (Table 1B). Compared to non-surgically managed patients, the surgically treated patients had a significantly lower 90-day readmission rate; on the other hand, surgically treated patients had a significantly longer length of stay, likelihood of non-home discharge, and total charge and cost (Table 2). When comparing surgical modalities, PCD had the shortest mean LOS, probability of readmission, probability of readmission, and lowest mean total charge. PCDF had the highest probability of readmission, and ACDF had the highest probability of complication and 30-day mortality (Table 3).

DISCUSSION AND CONCLUSION:

Central cord syndrome remains the most common incomplete spinal cord injury pattern. Appropriate management is still highly debated, but the current study found that surgical management is associated with decreased probability of 90-day readmission, and a trend toward decreased deaths within 90 days of discharge. However, this study also found that social disadvantages (as measured by ADI) trended toward lower rates of surgery, which aligns with previous studies where patients from lower socioeconomic backgrounds tend to have less access for orthopedic care. This may indicate a need for new policies that may allow for greater equity in orthopedic care by creating a treatment plan that considers and accommodates for patient socioeconomic factors.