Ventilation Requirements in Patients with Spinal Cord Injury at the Level of C3 to C5: a Retrospective NSCIMS Database Study.

Ashis Dhar, PhD, Abdul Karim Ghaith, MD, Antonio Bon Nieves, BS; Karim Nathani, MBBS; Mohamad Bydon, MD
[1]Neuro-Informatics Laboratory, Mayo Clinic, Rochester , MN
[2]Division of Neurological Surgery, Mayo Clinic, Rochester , MN

INTRODUCTION

The prevalence of spinal cord injury (SCI) in the U.S. has impacted around 500,000 people. Notably, advancements in therapies have contributed to increased survival rates among SCI patients. This evolving landscape emphasizes the need to shift healthcare priorities towards enhancing the well-being of those affected. Among these injuries, high cervical SCI stands out due to its significant impact, causing severe disabilities, increased mortality, and substantial socioeconomic challenges due to mechanical ventilation (MV).

OBJECTIVES

To investigate the effect of spinal cord injury has in mechanical ventilations at discharge using the national spinal cord injury model system database (NSCIMS).

METHODS

We conducted a search within the national spinal cord injury model system (NSCIMS) database to obtain a representative subset of individuals diagnosed with spinal cord injury (SCI) in the United States. Our sample comprised 3,339 patients registered in the database. We specifically enrolled participants aged 18 years and above, who exhibited cervical spinal cord injuries and had documented outcome information available. The primary outcome is assessing the necessity for MV post-injury and during the hospitalization phase. To explore the connection between MV and various cervical levels, we employed both univariate and multivariate analyses.

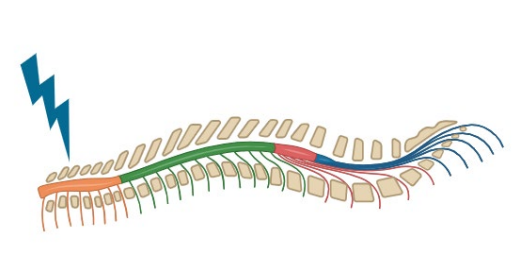

Figure 1: Contusion spinal cord injury at the cervical level.

Table 1: Association between different level of injury and patient state with mechanical ventilation.

Characteristics	Total (Total = 1507)	MV in admission (Total = 226)	No MV in admission (Total = 1281)	P-value
Neurologic Level of injury				<0.001
Above C3	110 (7.5%)	22 (10.2%)	88 (7.0%)	
C3	154 (10.5%)	35 (16.2%)	119 (9.5%)	
C4	509 (34.7%)	84 (38.9%)	425 (34.0%)	
C5	474 (32.4%)	60 (27.8%)	414 (33.1%)	
Below C5	218 (14.9%)	15 (6.9%)	218 (14.9%)	
ASIA at admission				<0.001
A	526 (36.2%)	168 (77.8%)	358 (28.9%)	
B	189 (13.0%)	34 (15.7%)	155 (12.5%)	
C	290 (20.0%)	12 (5.6%)	278 (22.5%)	
D	448 (30.8%)	2 (0.9%)	446 (36.1%)	
Tetraplegia				<0.001
Complete	526 (35.8%)	168 (77.8%)	358 (28.6%)	
Incomplete	938 (63.9%)	48 (22.2%)	890 (71.1%)	
Minimal	4 (0.3%)	0 (0.0%)	4 (0.3%)	
Length of Stay – Rehab (±SD) [Range]	53.3 (±43.6) [3 – 582]	87.4 (±47.2) [9 – 347]	47.4 (±40.0) [3 – 582]	<0.001

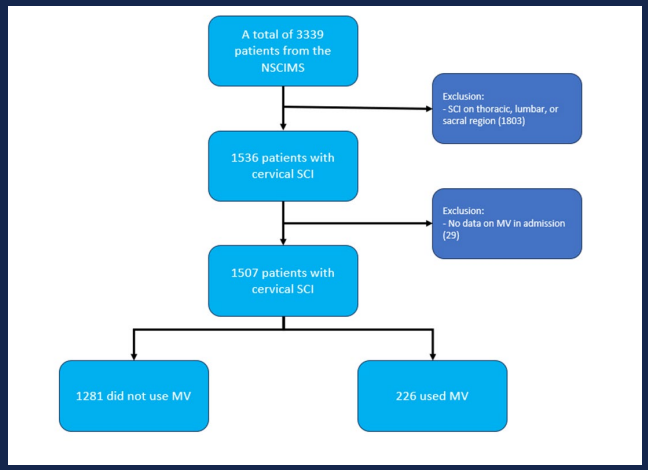

Figure 2: Flowchart of the inclusion criteria for patients with cervical SCI and mechanical ventilation use.

CONCLUSIONS

These findings show the association between high cervical SCI, the necessity for mechanical ventilation, and the associated clinical implications. Such insights can significantly inform both clinical practice and healthcare policies, driving interventions aimed at optimizing outcomes for this vulnerable patient population.

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