

COVID-19 and spinal cord injuries: the viewpoint from an emergency department resident with quadriplegia

Short running title: The effect of COVID-19 on spinal cord injuries.

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I am a resident who works in an Australian emergency department. I also have a spinal cord injury (SCI) with quadriplegia. At the onset of the COVID-19 pandemic, I began to think about its implications for people with SCIs.

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SCI patients are more vulnerable than their uninjured counterparts to complications from many conditions. As the world attempts to understand the disease, the potential effects of COVID-19 on those with SCIs will benefit from some consideration. Not only could the altered physiology in a person with SCI alter the presentation and management, but their social circumstances create complex logistical and ethical issues. These complexities can create significant challenges for emergency departments that come under siege during a pandemic.

The effect of disrupted physiology

Responses like a fever¹ and cough² typically expected from infectious stimuli can be impaired in a SCI. Normal physiological function such as respiration³ and immunity⁴ may also be affected. Sensorimotor disruption may mean that symptoms arising from an illness is not experienced the same way.⁵ Therefore, a SCI may present the perfect storm of a patient who has immunocompromise and respiratory impairment with an increased likelihood of other underlying chronic comorbidities⁶.

Many current testing guidelines for COVID-19 do not account for the altered physiology in a person with a SCI. Due to their disrupted physiology, features such as fever, cough and chest pain may be absent. Therefore, the risk of missing a COVID-19 diagnosis in a person with a SCI may be elevated.

In emergency departments, this situation may generate challenges in triaging SCI patients and directing them to appropriate areas with infection control. The infection control implications for a ventilator-dependent person with a SCI is unclear. The

infection control implications for assistive devices such as wheelchairs require consideration.

Due to disruptions in physiology, the risk of Acute Respiratory Distress Syndrome (ARDS) from COVID-19 may be higher than the normal population.⁷ Therefore, patients with SCIs may benefit from aggressive early management. This may include early access to experimental therapies where available. The discourse regarding ventilator therapy however, raises ethical challenges for what may become overloaded healthcare systems.

Healthcare rationing

At the early stages of the pandemic, concerns began to emerge about the rights of people with disability in responding to COVID-19.⁷ Literature already suggested that healthcare providers can make unfounded judgements regarding the quality of life in people with disabilities.⁸ In the United States, the Office of Civil Rights received complaints surrounding the rationing of life-saving therapy which adversely affects people with disabilities during the pandemic.⁹

In a SCI, the risk of a poor outcome is arguably higher compared to the normal population. In a resource-stretched department, this may create a tension between equity and efficiency. Therefore, people with SCI run a higher risk of being affected by healthcare rationing. To address this risk, healthcare providers should be educated on the ethical considerations when delivering healthcare to those with SCIs. Early advanced care planning may be beneficial. Civil rights organizations could proactively remind healthcare providers of their obligations.

In the event of an uncontrollable pandemic that overrun healthcare systems, difficult decisions will inevitably be made. Therefore, the best way to protect those with SCIs is to prevent them from becoming infected with COVID-19.

Prevention

Strict social isolation measures prevent the spread of disease to society's most vulnerable people. Public health messaging may create more of an impact by highlighting this point. Additionally, people with SCI may benefit from specific isolation instructions. That is, to strictly isolate themselves early in the pandemic to prevent infection. Such an activity is not without logistical challenges.

Many people with SCIs rely on daily caregivers to assist with activities of daily living. In the event of strict isolation, caregivers will need to be isolated as well. This is the only way to prevent the introduction of disease from the community. Such isolation is not without a significant financial and social cost.

The reliance on caregivers also places people with SCI at social risk. If the caregiver or a team of caregivers becomes affected by COVID-19, a person's entire care structure can be dismantled. Such an event may require social admissions to hospitals, or in worse cases, generate life-threatening neglect in the community. Social admissions will increase the risk of hospital-acquired complications as well as acquiring COVID-19 itself.

Emergency department presentations

In emergency department under siege, a high care SCI patient presenting for social reasons will add to the human resource requirement. Some patients will require staff skilled in ventilator management even in the absence of COVID-19. Others will require regular assistance with activities of daily living in addition to SCI-specific needs such as pressure relief and bladder management. In rural and remote emergency departments, the resource requirement may be felt more particularly as rural Australians with disabilities are more dependent on emergency departments.¹⁰

To mitigate the demand on health systems human resources, training a patient's regular caregivers to care for them in a department can be of benefit. This not only provides a familiarity of care, but people well-versed in the needs of the person being cared for. However, this is contingent on infection control requirements.

Where possible, early planning to streamline the emergency care of people with SCIs is of value. Planning may include ascertaining optimal ways to triage these patients; creating an accessible assessment and management space with thought to unique infection control requirements; considering early aggressive management where indicated; enabling rapid disposition pathways; and ensuring the availability of necessary social services. This type of planning can not only benefit patients with SCIs, but also other disabilities.

Considering the complexities of the hospital admission for a person with a SCI during the pandemic, the primary goal must remain to prevent them from being infected. If a patient presents for social reasons, rapid social interventions may facilitate a quick discharge back to the community.

Conclusion

People with SCI may benefit from specific diagnostic and treatment pathways during the COVID-19 pandemic. Prevention of disease in this group remains a critical priority due to the complex medical, social, and ethical challenges that widespread community infection can create.

While the SCI population face unique challenges, many of these are shared by the global community of people with disability. To protect the most vulnerable in our society from complications of COVID-19, health systems must create unique pathways and prioritise prevention. Nonetheless, in the event that patients attend emergency departments with COVID-19 associated presentations, emergency physicians should be aware of the medical and social complexities in managing this vulnerable group.

References

1. Trbovich, M., Li, C. and Lee, S. Does the CDC Definition of Fever Accurately Predict Inflammation and Infection in Persons With SCI? *Topics in Spinal Cord Injury Rehabilitation*. 22(4), pp.260-268. 2016.
2. Wang, A., Jaeger, R., Yarkony, G. and Turba, R. Cough in spinal cord injured patients: the relationship between motor level and peak expiratory flow. *Spinal Cord*. 35(5), pp.299-302.1997.

3. Zimmer M, Nantwi K, Goshgarian H. Effect of Spinal Cord Injury on the Respiratory System: Basic Research and Current Clinical Treatment Options. *J Spinal Cord Med.* 2007;30(4):319-330. doi:10.1080/10790268.2007.11753947
4. Popovich P, McTigue D. Damage control in the nervous system: beware the immune system in spinal cord injury. *Nat Med.* 2009;15(7):736-737. doi:10.1038/nm0709-736
5. Strauther G, Longo W, Virgo K, Johnson F. Appendicitis in patients with previous spinal cord injury. *The American Journal of Surgery.* 1999;178(5):403-405. doi:10.1016/s0002-9610(99)00207-x
6. Saunders L, Clarke A, Tate D, Forchheimer M, Krause J. Lifetime Prevalence of Chronic Health Conditions Among Persons With Spinal Cord Injury. *Arch Phys Med Rehabil.* 2015;96(4):673-679. doi:10.1016/j.apmr.2014.11.019
7. Armitage R, Nellums L. The COVID-19 response must be disability inclusive. *The Lancet Public Health.* 2020. doi:10.1016/s2468-2667(20)30076-1
8. Addington-Hall J. Measuring quality of life: Who should measure quality of life?. *BMJ.* 2001;322(7299):1417-1420. doi:10.1136/bmj.322.7299.1417.
9. United States Department of Health & Human Services. BULLETIN: Civil Rights, HIPAA, and the Coronavirus Disease 2019 (COVID-19). Published March 28, 2020.
10. Australian Institute of Health and Welfare. People with disability in Australia (Web Report). <https://www.aihw.gov.au/reports/disability/people-with-disability-in-australia/health> Updated September 3, 2009. Accessed April 3, 2020.