

Impact of the Covid-19 Pandemic on Delivery of Acute and Post-Acute Care to Patients with Newly Diagnosed Traumatic Spinal Cord Injury

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Abstract

Aim

To investigate the impact of the first wave of the Covid-19 pandemic on the care of patients with newly acquired traumatic spinal cord injury (TSCI) in Ireland

Methods

A prospective audit of patients with newly acquired TSCI from 1st March to 30th June 2020 was undertaken. Cases were drawn from referrals received through the National Spinal Injuries Unit (NSIU) and neurosciences centres. The standard of care guidelines used were from National Health Service (NHS) England standards, the Irish Integrated Care Pathway and British Association of Spinal cord Injury Specialist (BASCIS) COVID-19 guidelines.

Results

Nineteen patients sustained a TSCI during the study period. Thirteen patients (68%) were treated in the NSIU, eleven of whom were subsequently repatriated to non-specialist centres. Twelve patients (63%) waited an average of 113.8 ± 33.4 days for admission to specialist in-patient rehabilitation. Nine patients (75%) had developed at least one secondary complication by the time of admission.

Conclusion

With the exception of waiting time for specialist in-patient rehabilitation, delivery of TSCI care during this period was similar to the care previously recorded. Shortcomings in service provision are long-standing and highlight the need for timely implementation of an integrated trauma network for Ireland.

Introduction

Traumatic spinal cord injury (TSCI) is a complex medical condition with potentially devastating physical, social and psychological consequences for patients and their families¹. Optimal delivery of acute and subacute care to patients with newly acquired TSCI results in improved functional outcomes and may help to prevent some of the secondary complications associated with the initial injury². Indeed, management of such patients within specialist centres of care has been shown to improve patient outcomes in terms of reduced morbidity and mortality and decreased overall length of hospital stay³.

Appropriate standards of care for this pathway in the UK and Ireland have been established^{4,5}. In the acute setting, all patients with newly acquired TSCI should be transferred directly to a specialist spinal cord injury centre (SCIC) as soon as clinically stable. In Ireland, the only acute SCIC is the National Spinal Injuries Unit (NSIU) in the Mater Misericordiae University Hospital (MMUH). Occasionally, patients have acute management in either of two neurosciences centres in the country, in Beaumont and Cork University Hospitals. Ideally patients should remain in a SCIC for the duration of their acute care. Due to limited capacity in the NSIU however, patients are often briefly admitted for surgical intervention and then re-patriated to local non-specialist units for further management. Following completion of acute care, patients should then have timely access to specialist rehabilitation facilities. In Ireland, the National Rehabilitation Hospital (NRH) is the only specialist unit for spinal cord injury rehabilitation. Patients can be referred to the NRH from any hospital in the country.

On 29th February 2020 the first case of novel coronavirus (Covid-19) was confirmed in Ireland and shortly after this, the outbreak was declared a global pandemic by the World Health Organisation. This unprecedented situation has had a major impact on the delivery of Irish healthcare services⁶. During the first wave of the pandemic, from March to June 2020, rapid adjustments were made in order to maximise surge capacity within the acute hospital sector. These measures included recruitment of additional healthcare workers, expansion of ICU capacity and suspension of elective procedures and screening services⁶.

In the United Kingdom, guidelines were issued on maintaining the TSCI care pathway within the context of the Covid-19 pandemic⁷. Regarding acute care, it was recommended that all patients with a newly acquired spinal cord injury should continue to be admitted to specialist spinal cord injury centres in a timely manner. An audit was undertaken to investigate adherence to this standard during the first wave of Covid-19 in Ireland. It was hypothesised that reorganisation of healthcare services to maximise acute hospital capacity may have negatively impacted on the delivery of acute and post-acute care to patients with newly acquired TSCI. For the purpose of this audit, indicators of negative impact on care delivery included reduced access to specialist acute SCI care or complex specialist rehabilitation, increased waiting time for in-patient specialist rehabilitation and development of avoidable secondary complications while awaiting transfer to in-patient specialist rehabilitation.

Methods

This audit focused on the first wave of the Covid-19 pandemic in Ireland. All patients who sustained a new TSCI during the period 1st March to 30th June 2020 were included. Cases were drawn from all referrals received through the NSIU and referrals received directly from the Neurosciences centres. Patients who subsequently declined the service or were not deemed appropriate for in-patient specialist rehabilitation were included.

The following time points were recorded: date of injury onset; date of referral to specialist rehabilitation services at the NRH and date of admission to the NRH. Waiting time for admission was calculated as the number of bed-days between referral and admission to the NRH. Also recorded were whether patients were accepted for acute care to the NSIU for part of or the entire duration of their care; whether patients were accepted for specialist rehabilitation and if not, why not.

Additional data collected included aetiology of injury; neurological level and ASIA impairment scale (AIS) and number and nature of avoidable secondary complications present on admission to the NRH. Secondary complications were identified through retrospective chart review of medical and nursing admission documentation. These included pressure injuries; catheter-associated urinary tract infection (UTI); lower respiratory tract infection (LRTI); contractures; positive Covid-19 test and the absence of an established SCI bowel programme. Data were analysed using simple descriptive statistics in Microsoft Excel.

Results

Nineteen patients sustained a TSCI during the defined study period. Table 1 provides a summary of clinical details (injury aetiology, neurological level, and ASIA impairment scale) for these patients. One patient was unable to participate in a meaningful neurological examination due to ongoing delirium.

Table 1: Clinical details for all patients with newly acquired TSCI (n = 19).

Level / AIS	Frequency
C1 – C4 AIS A, B, C	5
C5 – C8 AIS A, B, C	3
T1 – S5 AIS A, B, C	5
AIS D	5
Not specified	1
Aetiology	
Fall	17
Road traffic collision	1
Sports / recreation	1

Thirteen patients received some or all of their acute care in the NSIU. Eleven of these patients were subsequently repatriated to a local centre to await in-patient specialist rehabilitation. The two patients who remained in the NSIU lived within the catchment area of the parent hospital (MMUH).

Twelve patients were admitted to the NRH for in-patient rehabilitation. Reasons for non-admission were: one patient achieved adequate recovery and did not require specialist in-patient rehabilitation; two patients declined admission; two patients were deemed too frail to benefit from an in-patient rehabilitation programme; one patient was transferred directly to a palliative care unit and did not survive her injury; one patient sustained her injury overseas and, although she was referred to rehabilitation services in Ireland, received all of her care elsewhere.

For the cohort of patients accepted to the NRH, the number of bed days between referral and admission to specialist rehabilitation ranged from 43 to 192 days. The average waiting time (mean \pm standard deviation) was 113.8 ± 33.4 days.

Nine out of 12 patients (75%) who were admitted to the NRH had at least one avoidable secondary complication on admission. A breakdown of these is presented in Table 2. Of the three patients who did not present with a complication, two of these received the entirety of their acute care in the NSIU.

Table 2: Prevalence of avoidable secondary complications on admission to specialist rehabilitation.

Complication	Frequency
Absence of established bowel programme	5
Pressure injury (≥ 1)	4
LRTI	3
Covid-19 positive	3
Catheter-associated UTI	2
Contractures	0

Discussion

This audit looked at the delivery of acute and post-acute TSCI care during a four-month period corresponding to the first wave of the Covid-19 pandemic in Ireland. The findings are compared with data from previous years in order to evaluate the potential impact of the pandemic on this care pathway.

The occurrence of 19 new cases of TSCI over a four-month period can be extrapolated to an estimated incidence of 57 cases for all of 2020. This is similar to the range of 53 – 61 cases per year which has been reported for the period 2010-2016^{8,9}.

This finding is somewhat unexpected given the suspension of recreational sporting activities and reduction in road traffic volume associated with restrictions imposed during this time¹⁰. Indeed, falls were the leading cause of injury by a wide margin accounting for 17 cases (89%), with only one case each attributable to road collision and sporting injury. While falls have previously been identified as the leading aetiology of TSCI in Ireland since 2016⁹, these data would appear to represent an increase in the relative proportion of falls compared with other aetiologies. Given the small number of patients included in this audit however, it is difficult to draw firm conclusions in this regard. In fact, by the end of 2020, the overall number of TSCI was lower than in previous years at 44 (personal communication, author 2), confirming the challenge of making comparisons when numbers are small.

The proportion of patients who did not receive acute care in a specialist SCIC (32%) was slightly higher during this study period compared with previous years (28% in 2017)¹¹. Similarly, the proportion of patients not entering in-patient specialist rehabilitation was also slightly higher at 36% compared with 25% in 2017¹¹. The number of patients repatriated to a non-specialist centre following acute surgical intervention in the NSIU was similar to previous years¹¹. These data indicate minimal impact of the Covid-19 pandemic on the numbers of patients passing through the current TSCI pathway.

The most striking finding was the average number of bed days between referral and admission to specialist in-patient rehabilitation (113.8 ± 33.4 days). This figure is much higher than the 75 days reported for 2019¹². When interpreting this, however, it should be noted that patients identified with TSCI are immediately referred for rehabilitation assessment and are often reviewed at a very early stage in their recovery. Patients may therefore be placed on the NRH waiting list before they are deemed ready to engage with the programme. The total number of days between referral and admission may thus be inflated by the inclusion of time during which the patient was not ready for the service. Even accounting for this, there are multiple reasons why the waiting time for NRH admission was prolonged. During the study period, the layout of the NRH consisted of multi-bedded wards with a limited number of single rooms. The maximum bed occupancy of the hospital was therefore reduced during the pandemic to facilitate distancing on open wards and availability of isolation spaces. Restrictions on admissions from acute hospitals were introduced during March through June to limit introduction of Covid-19 into the NRH. It is also likely that suspension of community rehabilitation services and restrictions on nursing home admissions resulted in an increase in delayed discharges from rehabilitation, thereby delaying admissions.

The majority of patients (75%) presented with at least one potentially avoidable secondary complication on admission to specialist rehabilitation. Of these, absence of an established bowel programme was the most common ($n = 5$), followed by pressure injury ($n = 4$). Given the small sample size it is difficult to compare these data with previous years in order to draw any meaningful conclusions regarding potential impact of the Covid-19 pandemic.

Three patients tested positive for Covid-19 prior to their NRH admission. Of these, one patient had asymptomatic infection and two patients had a mild self-limiting illness. Covid-19 status did not delay NRH admission in any case.

In conclusion, the established TSCI care pathway was largely adhered to during the first wave of the Covid-19 pandemic in Ireland with the exception of waiting time for admission to specialist rehabilitation. Since this time, the NRH has relocated to a new purpose-built facility with single rooms for all patients. It is hypothesised that this transition may have limited the need to reduce bed occupancy during subsequent waves of the pandemic. The impact of this change on waiting times for specialist rehabilitation should be explored in a future audit. While in keeping with trends from previous years, the data highlight shortcomings in the delivery of TSCI care which are long-standing within the Irish healthcare system. It is hoped that implementation of the Trauma System for Ireland, which has been in development since 2013, will help to address some of these shortcomings and facilitate improvements in the TSCI care pathway¹³.

Declaration of Conflict of Interest:

The authors declare no conflict of interest

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