Rehabilitation of patients with spinal cord injuries in non-specialist units: is this good enough?

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Introduction

Reliable data on the incidence and prevalence of spinal cord injury (SCI) in UK are not available.
The National SCI Database, to our knowledge, has not issued any report on this yet. Inferences from 3rd sector organisations hypothesizes that there are an 50,000 people in the UK living with a SCI and each year approximately 2,500 people are newly injured. Most importantly there is lack of published rehabilitation inpatients outcomes in UK.

From long time (Donovan et al. 1984, Tator et al. 1995) there is general agreement that a specialized, integrated approach should result in better outcomes. More recent scientific literature suggests that an "Early transfer of patients with SCI to an integrated multidisciplinary specialized center of care decreases overall mortality, and the number and severity of complications."

This does not always happen and in reality not all the patients with a SCI (traumatic or non-traumatic) access spinal units for various reasons (i.e. lack of beds, long waiting list, patients' choices).

In the UK, many patients with spinal conditions access non specialist rehabilitation settings, mostly Level 2 units. Are these units offering a good service to this group of patients?

In the lack of available national data we have benchmarked the outcomes over the last 7 years of a Level2a unit (Plym Neurorehabilitation Unit-PNRU) with the Australasian Rehabilitation Outcomes Centre (AROC): this is the national rehabilitation medicine clinical registry of Australia and New Zealand.

For SCI conditons AROC publishes yearly data on demographics, length of stay, Functional Independecne Measure (FIM) gain, FIM efficiency, discharge destnation for specialist and non-specialist inpatient rehabilitation settings.
Patients with SCI are stratified in homogenoeus group accordign to the FIM following the below algorithm.

4AD1	Spinal cord dysfunction, Age ≥ 50, weighted FIM motor 42-91
4AD2	Spinal cord dysfunction, Age ≥ 50, weighted FIM motor 19-41
4AD3	Spinal cord dysfunction, Age ≤ 49, weighted FIM motor 34-91
4AD4	Spinal cord dysfunction, Age ≤ 49, weighted FIM motor 19-33

AROC uses a weighted FIM motor score to define admitted rehabilitation classes to reflect the relative impact of each item on the cost of caring for the rehabilitation patient.

Impairment-specific FIM™ item weights for overnight rehabilitation classes

Impairment Group	FIM eat	FIM grm	FIM bath	FIM upp	FIM low	FIM toil	FIM blad	FIM bow	FIM xfer	FIM xftlt	FIM tub	FIM walk	FIM stair
Spinal Cord Dys	0.924	0.803	1.238	0.843	0.926	1.246	0.822	0.810	1.137	1.455	1.465	0.233	1.098

We have stratified and analysed our patients according to the AROC guidelines

Objectives

The purpose of this study was to:

1) benchmark 7 years data of an british Level 2a Rehabilitation Unit (Plym-PNRU) with Australasian data on inpatient rehabilitation for patients with spinal cord injury (AROC 2017 report) rispectively on non-specialist and specialist units.
2) analyse LOS, rehabilitation improvements, discharge destination in our cohort of patients
3) Discuss our data in regional/national meetings in order to review the pathway for spinal cord injury conditions

Methods

All patients diagnosed with a spinal condition admitted to our Level2a Unit between January 2012 and December 2018 were retrospectively divided into 4 functional groups using the AROC stratification based on the FIM instrument: AD1,AD2,AD3,AD4 respectively "older" patient less impaired, more impaired and "younger" patients less impaired, more impaired.

The FIM data were extracted from our database. Demographic data, length of stay, FIM admission, FIM gain, FIM efficiency and discharge destination were assessed. Data from our Level2a unit were compared with the AROC non specialist and specialist sites.
Patients were excluded from this study if died or were re-transferred to an acute setting and not came back to rehabilitation.

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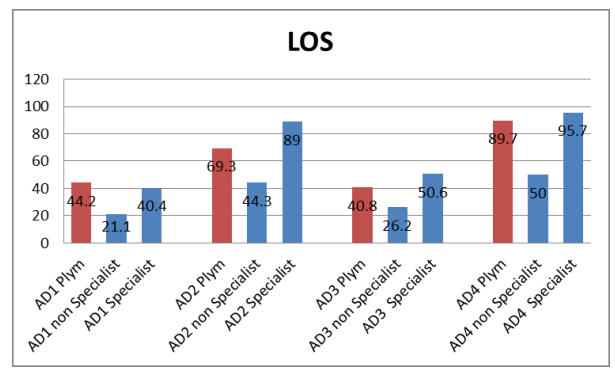
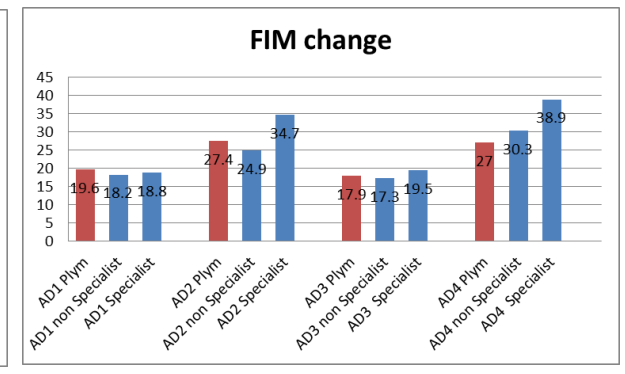
Results

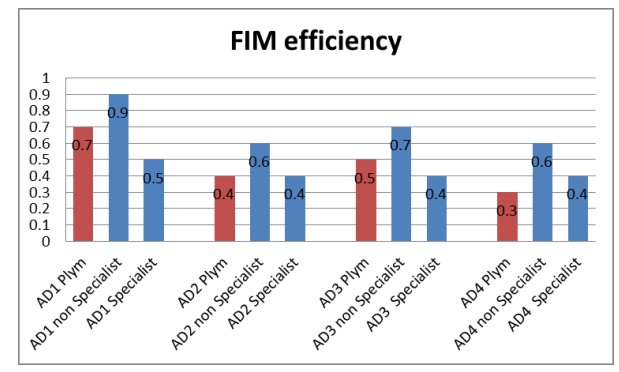
Of a total of 101 PNRU patients admitted and discharged with spinal cord dysfunction from January 2012 to December 2018,100 met the inclusion criteria.

AN-SNAP class fro PNRU	AD1	AD2	AD3	AD4
Number of episodes	22	57	18	3
Proportion				
Male	63%	53%	55%	66%
Female	27%	47%	45%	33%
Age (mean+95% CI)	67 (4.9)	74(2.7)	42(3.3)	28(25.7)
SD	11.1	11.7	6.8	10.3
Admission FIM (mean+95% CI)	93.0 (6.6)	56.2(3.1)	101.6(6.5)	46.3(22.4)
SD	15.0	11.7	13.2	9.0
LOS (mean+95% CI)	44.2(12.1)	69.3(8.5)	40.8(10.5)	89.7(133.3)
SD	27.3	32.3	21.2	53.6
Discharge to community (home,Residential care, temporary)	77%	81%	83%	100%
FIM change (mean+95% CI)	19.6(6.0)	27.4(4.9)	17.9(6.8)	27.0(86.1)
SD	13.6	18.8	13.8	34.6
FIM efficiency(mean+95% CI)	0.7(0.3)	0.4(0.1)	0.5(0.1)	0.3(0.5)
SD	0.7	0.4	0.3	0.2

Age and FIM admission were similar on the 3 settings. The median LOS in days in our unit for the 4 groups was comparable with specialist AROC centres. FIM gain for each group are similar to the non specialist setting but the 2 classes with severe impairment are inferior to the specialist centees. The FIM efficiency outcomes are more similar to specialist units whereas the non specialist AROC units have it higher in reason of a shorter LOS. The discharge to community been similar to benchmark (82.4%, 54.6%, 80.8%, 42.9%) except for the AD2 group that has been markedly higher.







Conclusion

Our results show that a non spinal-specialist rehabilitation unit can provide, across the years, a service that guarantees, for patients with a spinal condition, good functional outcomes and good efficiency, especially in the groups AD1 and AD3 (less severe impairment). The FIM gain for the group AD2 (age>50 with more severe impairment) have been inferior to the specialist settings (7 FIM points). In this case, a possible selection bias (i.e. patients declined by/not accessing the spinal units because elderly/frail) can be present but this is definitely an outcome that must be further analysed. Outcomes from the AD 4 group(<49, severely impaired) are not significant as, rightly, only 3 have accessed our service over 6 years. The important domain of neurogenic sphincters management has not been explored in this study.
Even if our retrospective study has showed that a Level2 unit can provide a good service, in our opinion an urgent benchmarking is required with the british spinal units in order to review if a re-organisation of pathways and services is required to offer the best optimal care to the patients with spinal injury.

References

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