



PROFILE OF PRESSURE ULCER AND OTHER COMPLICATIONS IN TRAUMATIC SPINAL CORD INJURY PATIENTS

Physical Medicine

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ABSTRACT

Study design: Retrospective Descriptive Study

Setting: Department of Physical Medicine and Rehabilitation (PMR), Regional Institute of Medical Sciences, Imphal.

Study period: 1st January 2020 to 31st December 2021.

Aim and object: To study the profile of pressure ulcer and other complications in traumatic spinal cord injury patients.

Materials and methods: Hospital files of traumatic SCI patients admitted in the Department of Physical Medicine and Rehabilitation, RIMS, Imphal were studied retrospectively. Demographics, cause of injury, neurological level of injury (NLI), American Spinal Injury Association (ASIA) Impairment Scale and complications were recorded.

Result: Among 32 patients, spasticity was present in 24 (75%) cases, urinary tract infection in 20 (62.5%) cases, pressure ulcer in 8 cases (25%) and orthostatic hypotension, bladder stone and heterotopic ossification in 2 cases each. There were 4 cases of pressure ulcer (50%) in ASIA A, 2 (25%) each in ASIA B and ASIA C. Four patients (50%) with cervical level of injury and 4 patients (50%) in upper thoracic level of injury had pressure ulcer. Sacral pressure ulcer accounted for (50%) of the total pressure ulcer cases. Grade 3 pressure ulcer was the most common grade.

Conclusion: Spasticity was the most common complication. Pressure ulcer was present in 25% of the total population. Sacral area was the most common site for pressure ulcer and grade 3 pressure ulcer was the commonest grade. Higher level of injury was associated with higher percentage of pressure ulcer.

KEYWORDS

Spinal cord injury, American Spinal Injury Association (ASIA), Neurological level of injury (NLI), Pressure ulcer

INTRODUCTION

Spinal cord injury (SCI) is a major neurologic disorder with profound functional, economic, psychological and social impacts.¹ There are different types of secondary complications usually suffered by spinal cord injured patients, among them are pressure ulcer, urinary complications, sexual dysfunctions, and bowel bladder problems. These complications lead to a great deal of disability, morbidity, degree of dependence, and mortality. The leading cause of mortality among SCI patients is respiratory system diseases. Heart disease comes second, followed by septicemia which is usually associated with pressure ulcer, urinary tract infection, or pneumonia.² Pressure ulcer is the second most common secondary complication following a spinal cord injury. Pressure ulcers affect quality of life, length of stay during hospitalization and increase mortality and morbidity.³ Availability of literatures regarding the profile of complications including pressure ulcer following spinal cord injury in north east India is scarce. This study was attempted to find out the profile of pressure ulcer and other complications in patients suffering from traumatic spinal cord injury.

AIMS AND OBJECTS

To study the profile of pressure ulcer and other complications in traumatic spinal cord injury patients.

MATERIALS AND METHODS

Data were collected and reviewed retrospectively from the hospital files of traumatic SCI patients admitted in the Department of Physical Medicine and Rehabilitation, RIMS, Imphal between 1st January 2020 and 31st December 2021. Only the data of first admission were included in the study. Demographics, cause of injury, neurological level of injury (NLI), American Spinal Injury Association (ASIA) Impairment

Scale, and complications were recorded. Data were entered in Microsoft excel and checked for any discrepancy in data. Statistical analysis was done using SPSS version 21. Frequencies, percentage and means were calculated.

RESULTS

Demographics and neurological characteristics are shown in Table 1.

Table 1. Demographics and neurological characteristics

Profile	Value
Age in years (mean±SD)	46.13±14.58
Sex(male:female)	30:2
Duration of injury in months (mean±SD)	23.38±18.77
Hospital stay in days (mean±SD)	18.81±12.13
Occupation	Business 15 (46.9%) Manual worker 8 (25%) Sedentary worker 4 (12%) Unemployed 5 (15%)
Complete:incomplete injury	10:22
Tetraplegic:paraplegic	16:16
Motor Score (mean±SD)	65.81±27.77
Sensory score (mean±SD)	57.00±28.45
ASIA	A 10 (31.3%) B 4 (12.5%) C 4 (12.5%) D 12 (37.5%) E 2 (6.3%)
NLI	Cervical 16 Upper Thoracic 10

	Lower Thoracic	4
	Lumbar	2
	Sacral	0

A total of 32 patients with mean age of 46.13 ± 14.58 years were included. Majority of them were male (93.75%). Fifteen (66.9%) of them were business persons, followed by manual worker (25%), sedentary worker (12%) and unemployed (15%). Incomplete spinal cord injury was more common (68.78%) as compared to complete injury (31.25%). Cervical level injury was the most common level accounting 50% of the total cases, followed by upper thoracic (31.25%), lower thoracic (12.5%) and lumbar (6.25%). Mean motor and sensory scores were 65.81 ± 27.77 and 57.00 ± 28.45 respectively.

Table 2 Complication Profile Of Patients

Complications	No. of cases (%)
Spasticity	24 (75%)
UTI	20 (62.5%)
Pressure ulcer	8 (25%)
Orthostatic hypotension	2 (6.3%)
Bladder stone	2 (6.3%)
Heterotopic ossification	2 (6.3%)

Most of the patients had at least one complication. Spasticity was present in 24 cases (75%), urinary tract infection (UTI) in 20 cases (62.5%), pressure ulcer in 8 cases (25%) and orthostatic hypotension, bladder stone and heterotopic ossification in 2 cases each.

Table 3. Pressure Ulcer Distribution In Different Profiles

		Pressure ulcer Number (%)
ASIA Impairment Scale	A	4 (50%)
	B	2 (25%)
	C	2 (25%)
	D	0
	E	0
NLI	Cervical	4 (50%)
	Upper thoracic	4 (50%)
	Lower thoracic	0
	Lumbar	0
Site	Sacral	4 (50%)
	Trochanteric	2 (25%)
	Sacral-Trochanteric	2 (25%)
Grade	Grade 1	2 (25%)
	Grade 2	2 (25%)
	Grade 3	3 (37.5%)
	Grade 4	1 (12.5%)

Table 3 showed distribution of pressure ulcer among the different ASIA impairment scales, neurological level of injuries, different sites and grading. There were 4 cases (50%) with ASIA A, 2 (25%) each with ASIA B and ASIA C. Four out of 10 patients (40%) with ASIA A developed pressure ulcer. Among the 22 patients with incomplete injury (ASIA B and ASIA C), only 4 (18.18%) developed pressure ulcer. Four patients (50%) with cervical level of injury and 4 patients (50%) in upper thoracic level of injury had pressure ulcer. The most common site for pressure ulcer was found to be sacral area (50%). Grade 3 pressure ulcer was the most common among all the grades.

DISCUSSION

The present study showed the mean age of spinal cord injury patients as 46.13 ± 14.58 years. Similar findings have been found in other studies too. Goel et al⁴, in their study, found the mean age to be 46.65 ± 16 years. Charco et al⁵ also found most of the patients were in their 3rd or 4th decade of life.

Different studies gave different observations regarding the commonest cause of traumatic spinal cord injury. Chhabra et al⁶ found road traffic accident as the commonest cause of traumatic spinal cord injury followed by fall from height. Whereas, Agarwal et al⁷ observed fall from height as the leading cause of traumatic spinal cord injury. The present study also observed fall from height (47%) to be the commonest cause of spinal cord injury followed by road traffic accident (38%). Chanu et al⁸ also observed similar findings with our study.

Previous studies have found that males are more affected compared to females.⁹ Similar observations have been made in the present study too.

Nulle A et al¹⁰ found pain as the most common complication (77%) followed by spasticity (48%), urinary tract infection (45%), pressure ulcers (25%), and orthostatic hypotension (14%). The present study found spasticity as the most common complication (75%), followed by urinary tract infection (62.5%), pressure ulcer (25%), orthostatic hypotension (2%), bladder stones (2%) and heterotopic ossification (2%). The higher number of pain in the study by Nulle A et al¹⁰ may be because of their study in the sub-acute period of the injury.

Incidence of pressure ulcer has been reported to have wide variation. Brienza D et al¹¹ reported pressure ulcer in 37.5% of the cases in acute care hospitalization and inpatient rehabilitation. Nogueira et al¹² also found pressure ulcer in 42.5% of the patients in their study. Most of the pressure ulcer occurs during acute care in contrast to the later admission. Brienza D et al¹¹ also reported pressure in 27% of acute spinal cord injury and 12 % during later admission. In the present study, pressure ulcer was found to be present in 25% of the cases. In our study, most of the patients were later in-patient admissions that may be the reason for overall lower percentage of pressure ulcer.

Verschueren JH et al¹³ observed the most common site for pressure ulcer was sacral area. In their study, sacral pressure ulcer constituted 43% of all pressure ulcer. In our study, 50% of the pressure ulcer was present in sacral area, followed by sacral-trochanter (25%) and trochanteric area (25%). Different studies had reported varied frequencies of pressure ulcer grades among the SCI patients. In the study conducted by Verschueren JH et al¹³, most of the pressure ulcers were in either grade 1 or 2. Whereas, Salzberg et al¹⁴, in their study in a population of chronic SCI patients living in the community, found that most patients had grade 3 or 4 ulcers. In our study, grade 3 pressure ulcer had the maximum frequency (37.5%). This may be because of the fact that, most of the patients in our study were of chronic SCI. The finding was in accordance with findings of Salzberg et al¹⁴.

Scheel-Sailer A et al¹⁵ found that pressure ulcer was more common among the patients with ASIA A compared to other incomplete injuries. Similar findings were observed in our study too. In our study, 4 out of 10 patients (40%) with ASIA A developed pressure ulcer. Whereas, among the 22 patients with incomplete injury (ASIA B and ASIA C), only 4 (18.18%) developed pressure ulcer.

Brienza D et al¹¹ reported higher percentage of pressure ulcer (49%) among cervical level of injury. Similar finding was observed in our study too. Fifty percent of pressure ulcer was observed in cervical level (C2-C7) and another 50% in injuries at upper thoracic level (T1-T6). None of the patients with injury at lower thoracic and lumbosacral region had pressure ulcer. Higher percentage of pressure ulcer had been observed with higher level of injury. This could be because of mobility issues with higher level of injury. We could not go further into sub analysis as the present study population was small.

Limitations of the study

Small sample size was one of the major limitations of the study. Being a retrospective study, we could not study in details about the factors for pressure ulcer development and other complications. There was no consideration for pressure relieving devices and prognostic indicators like Braden scale.

CONCLUSION

The most common cause of SCI was found to be fall from height. Majority of the patients had ASIA A. Spasticity was the most common complication, followed by urinary tract infection, pressure ulcer, orthostatic hypotension, bladder stones and heterotopic ossifications. Pressure ulcer was present in 25% of the total population who were admitted later for rehabilitation program. The most common site for pressure ulcer was found to be sacral area, and grade 3 was the most common grade. Higher level of injury was associated with higher percentage of pressure ulcer. Future prospective studies with larger sample size considering all important risk factors and interface pressure monitoring devices will help in planning the management of pressure ulcer.

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