



## A Seven Year Retrospective Review of Spinal Cord Injury Managed at a Physiotherapy Clinic in a South-western Tertiary Hospital in Nigeria

**Olukoju Idowu\*, Opeyemi Oluwasanmi Adeloye, Olaniran Moses Ogunleye, Olubukola Arewa, Oyenyin David Babatunde and Adegbembo Olusaanu**

*Department of Physiotherapy, University of Medical Science Teaching Hospital, Ondo, Nigeria*

**\*Corresponding Author:** Idowu Olukoju, Department of Physiotherapy, University of Medical Science Teaching Hospital, Ondo, Nigeria.

**Received:** September 29, 2020

**Published:** November 28, 2020

© All rights are reserved by **Olukoju Idowu, et al.**

### Abstract

**Introduction:** The role of physiotherapy in the management and rehabilitation of spinal cord injury (SCI) patient is well documented. SCI is an enormous devastating condition which affect most commonly young and productive age group of predominantly male population with motor vehicle accidents accounting for the highest incidence.

**Method:** This is a retrospective review of cases of spinal cord injured patient as seen in the Department of Physiotherapy University College Hospital Ibadan, Nigeria, over the 7 year period, January 1, 2006 to December 31, 2012. The case note accessed account for both out patients and in-patient seen at the hospital for the period under review. Information regarding Age, Gender, Marital Status, Occupation, Year of admission, Religion, Diagnosis/Frankel classifications, Neurological levels and Discharge pattern were retrieved using a spread sheet. Descriptive statistics of frequency, percentage, range, mean and standard deviation were used to summarize data.

**Result:** Two hundred and twenty six patients, 154 (68.1%) male and 72 (31.9%) female (M: F=2:1), were studied. Their age ranged from 13 to 81 years with a mean age of 43.24years. One hundred and eighty eight (61.9%) had traumatic SCI out of which a total of 103 (45.4) resulted from RTA, fall accounted for 30 (13.2%) cases and 2(0.9%) from penetrating injuries. At presentation 70 (31.0%) patients present with grade A, 33 (14.6%) patients were B, 48 (21.2%) patients had C, and 34 (15.0%) patients had grade D. However at discharge 49 (21.7%) patients had grade A, 22 (9.7%) patients with grade B, 22 (9.7%) patients had C, 57 (25.2%) patients had D while 4 (1.8%) patients had E. Etiology of SCI was found to be significantly associated with each of age ( $\chi^2= 35.19$ ;  $p = 0.00$ ) and marital status ( $\chi^2= 35.19$ ;  $p = 0.00$ ) respectively.

**Conclusion:** The pattern of SCI from this study showed that RTA is the most common cause affecting mostly young male. The cervical injury was the most implicated in this study and appreciable amount of patient discharged from the ward continued rehabilitative management.

**Keywords:** Spinal Cord; Physiotherapy; RTA

### Introduction

The role of physiotherapy in the management and rehabilitation of spinal cord injury (SCI) patient is well documented [1]. SCI is an enormous devastating condition which affect most commonly young and productive age group of predominantly male population with motor vehicle accidents accounting for the high-

est incidence [2,3]. It affects negatively all the parameters of their life including physical, emotional, financial and social cost [4-7]. Although there have been major advances in neurological treatment for SCI, the mortality rate for this condition remains high relative to ambulatory populations [8,9] with worse survival rates in low- and middle-income countries [10-12]. Despite well-established works

on burden of SCI and its treatment [10,13-15] in developed countries, only few focused on the profile of patients that has received rehabilitation in developing country.

Respiratory and renal conditions have been the most prevalent comorbidities and they still remain important cause of mortality. However, data published in recent years suggest that cardiovascular disease (CVD) has emerged as the leading cause of mortality in chronic SCI [16]. Incidence varies from country to country in the range of 10 to 50% per million population per annum with the actual incidence figure still difficult to assess in our environment as most of the victims die before reaching hospital [17].

Acute care, rehabilitation services and ongoing health maintenance are essential for prevention and management of these conditions [12]. Hence, this study sort to find the incidence, outcome and discharge pattern of SCI patient seen in the department of physiotherapy of a tertiary teaching hospital.

## Patients and Methods

### Procedure

This is a retrospective review of cases of spinal cord injured patient as seen in the Department of Physiotherapy University College Hospital Ibadan, Nigeria, over the 7 year period, January 1, 2006 to December 31, 2012. The case notes of all patients with SCI were retrieved from the records Unit of the Physiotherapy department, University Collage Hospital, Ibadan. The case note accessed account for both out patients and in-patient seen at the hospital for the period under review. Information regarding Age, Gender, Marital Status, Occupation, Year of admission, Religion, Diagnosis/ Frankel classifications, Neurological levels and Discharge pattern were retrieved using a spread sheet. Descriptive statistics of frequency, percentage, range, mean and standard deviation were used to summarize data.

## Results

### Mean, SD, Range of each of age, frequency distribution according socio-demographic characteristic and Physiotherapy (PT) sessions of patients

Two hundred and twenty six patients, 154 (68.1%) male and 72 (31.9%) female (M: F=2:1), were studied. Their age ranged from 13 to 81 years with a mean age of 43.24years. The mean number of physiotherapy treatment sessions was 21.57 , with a range between a minimum of one session and a maximum of 152 sessions. (Table 1). Seventy-six (33.6%) were within 26 - 40 age category, while 63.7% were married (Table 2).

### Distribution based on occupation

Table 3 shows distribution based on occupation. Seventy (30.9%) were artisans, 58(25.7%) were civil servant, 31(13.7%) were students, 6 (2.7%) were unemployed, 9(4.0%) were farmer while 4(1.8%) were clergy.

Characteristic	Mean (SD)	Minimum	Maximum
Age	43.24 ± 16.56	13	81
PT Sessions	21.57 ± 19.34	1	152

**Table 1:** Mean, SD, Range of each of age and Physiotherapy (PT) sessions of patients.  
SD: Standard Deviation.

Gender		
	Female	72
	Male	154
Age Group		
	10 to 25	32
	26 to 40	76
	41 to 55	64
	56 to 75	37
	76 to 85	16
Marital Status		
	Single	56
	Married	144
	Widowed	8
	Separated	2
	NS	16

**Table 2:** Distribution based on Gender, Age group and Marital status (N = 226).  
\*NS: Not Stated.

Occupation	Number of cases
Artisan	70
Business	7
Civil servant	58
Clergy	4
Farming	9
Retired	14
Student	31
Unemployed	6
NS	27

**Table 3:** Distribution based on occupation (N = 226).  
\*NS: Not Stated.

**Distribution of patients based on etiology of SCI**

In table 4, one hundred and eighty eight (61.9%) had traumatic SCI out of which a total of 103 (45.4) resulted from RTA, fall accounted for 30 (13.2%) cases and 2(0.9%) from penetrating injuries. While Forty five (21.7%) were from non-traumatic etiology [neoplasm-10(4.4%); infection- 11(4.8%); spondylotic myelopathy, neuromyelitisoptica, vascular disorders and space occupying lesions account for 26 (11.5%)].

**Distribution of patients based on clinical diagnosis and pattern of discharge**

A total of 124(54.2%) cases were Quadriplegic while 91 (40.1%) were paraplegic, however 2(0.9%) were unaccounted for (Table 5). One hundred and fifty four (68.2%) were discharged out of which 60(39% of 154 patient discharged) continued physiotherapy at outpatient. 44(10.2%) of patient were discharged against medical advice, while mortality was 13(5.8%) for the period under review (Table 6).

**Severity of injury based on Frankel's classification at presentation and at last review**

In Table 7, at presentation 70 (31.0%) patients present with grade A, 33 (14.6%) patients were B, 48 (21.2%) patients had C, and 34 (15.0%) patients had grade D. However at discharge 49 (21.7%) patients had grade A, 22 (9.7%) patients with grade B, 22 (9.7%) patients had C, 57 (25.2%) patients had D while 4 (1.8%) patients had E.

Traumatic		
	RTA	103
	Fall	30
	Violence	2
	Occupation	5
Non-Traumatic		
	Neoplasm	
	Infection	
	Others	
NS		41

**Table 4:** Pattern of distribution based on etiology (N = 226).

\*NS: Not Stated.

Clinical Diagnosis	Number of cases
Quadriplegia	124
Paraplegia	91
NS	11

**Table 5:** Pattern of distribution according to clinical diagnosis (N = 226).

\*NS: Not Stated.

Pattern of discharge	Number of cases
Deceased	13
DAMA	44
Referred	92
Discharged from the ward and continued OPD	60
NS	38

**Table 6:** Distribution based on their pattern of discharge (N = 226).

\*NS: Not Stated.

Frankel classification	At Presentation	At Last review
A	70	49
B	33	22
C	48	54
D	34	57
E	0	4
NS	41	40

**Table 7:** Pattern of distribution based on Frankel's classification at presentation and at last review (N = 226).

\*NS: Not Stated.

**Pattern of distribution based on the level of affectation**

Out of 226 case reviewed, Seventy eight (34.5%) patients had high cervical spine injury, thirty nine (17.3%) had low cervical injury, sixty (26.5%) had thoracic spine involvement and sixteen (6.6%) patients with lumbar involvement (Table 8).

**Association between aetiology and each of age range and marital status**

Aetiology of SCI was found to be significantly associated with each of age ( $\chi^2= 35.19$ ;  $p = 0.00$ ) and marital status ( $\chi^2= 35.19$ ;  $p = 0.00$ ) respectively (Table 9 and Table 10).

Level of affectation	Number of cases
High Quadriplegia (C1-C4)	78
Low Quadriplegia (C5-C8)	39
Thoracic	60
Lumbar	16
NS	33

**Table 8:** Distribution based on the level of affectation (N = 226).

\*NS: Not Stated.

Aetiology					
Age range	Traumatic	Non-Traumatic	Ns	$\chi^2$	P-Value
10 to 25	19	9	4	35.19	0.000
26 to 40	62	4	10		
41 to 55	35	18	11		
56 to 75	18	6	13		
76 to 85	5	9	3		
Total	140	45	41		

**Table 9:** Chi-square test of association between age range and causes of SCI based on etiology.

\*NS: Not Stated.

Aetiology					
Marital status	Traumatic	Non-Traumatic	Ns	$\chi^2$	P-Value
Single	41	9	4	16.703 <sup>a</sup>	0.03*
Married	85	31	28		
Widowed	0	1	1		
Separated	2	4	2		
NS	1	0	6		
Total	140	45	41		

**Table 10:** Chi-square test of association between marital status and aetiology.

\*NS: Not Stated

\* P-value set at 0.05.

### Discussion

In this study, an epidemiological review of spinal cord injury (SCI) patients seen at the neurosurgery unit, department of Physiotherapy University College Hospital, Ibadan during the period Jan 2006 to Dec 2012. SCI prevalence was higher among male gender, with male to female ratio of approximately 2:1 and this finding is consistent with a previous study by Kawu., *et al.* [18] in Lagos dwellers. The majority of the SCI patients in this study were young male adults between the ages 25 – 40 years. Similar trends has been observed in several other studies [12,18,19], from Nigeria and other developing countries [20]. Attendant socio-economic problems in developing world might have been responsible for the high prevalence of SCI in this study group as these are economically active people and are often engaged in risky behaviours compared to other study groups. Also in this study it was observed that marital status is significant associated to the SCI aetiology. Previous studies

have not considered marital status as a predictor or risk factor for SCI. In this study, RTA was the leading cause of SCI affecting about 103(45.4%) of the study population which agrees with the findings from other studies from Nigeria [18,19,21]. Conversely, in another report, higher percentage were found in fall related SCI. This may be due to the fact that palm tree climbers constituted the majority in the study [22,23].

In this study, it was observed that high cervical injuries were the major types of SCI (34.5%) which concurs with the findings from other studies [24,25]. However, Odeku and Richard (1971) documented that the lumbar region has the highest predisposition to SCI. Variation in there aetiology might account for this difference. Also this can be link to the higher presentation of quadriplegia observed in this study which could be attributed to the higher incident of cervical injuries. Cervical regions as well as the thoracolumbar region have been implicated as areas of the spinal cord prone to horizontal forces [21].

From the result of this study, age was significantly associated with aetiology ( $\chi^2 = 35.19$  p=0.000) and high incidence of traumatic SCI among young adult may account for this. However, other studies reported a higher percentage of patients in the middle age group (55-64 years) [26-28] as compared to the findings of this study. Also, there was association between marital status and aetiology (p = 0.03). This result indicates that married people are at greater risk of traumatic SCI. However this is sharp deviation from another study by William., *et al.* [29].

In this study, there was improved neurological status seen in 56(24.78%) cases. Twenty one patients (9.3%) improved from complete SCI to incomplete SCI, 31(13.7%) improved ASIA B through ASIA D while four (1.8%) improved to ASIA E. Similar findings has been reported by William., *et al.* 1999. In contrast, Emejulu and Ekweogu (2009) reported no neurological improvement seen in patient with complete SCI, although, they reported improvement among incomplete SCI patient which concurs with the findings from this study. While it is not clear if the patient in the studies received physiotherapy and the type of physiotherapy treatment given, the benefit of physiotherapy in the management of SCI has been established in literatures [30-32]. In this study, patients were seen on an average of 76sessions and the physiotherapy treatment given were passive range of motion exercise, soft tissue massage, electrical muscle stimulation, tactile stimulation, chest physiotherapy, mat exercises and ambulatory training which may explain

the improved neurological status observed. Although this study did not take into account the effect of the individual physiotherapy techniques and frequency of treatments used. Its note worthy that some of the patients was seen while still on the ward and physiotherapy continued on out-patient basis and they receive some or all of these physiotherapy interventions mentioned.

In this study, there were quite a number of the patients discharged from the wards 175 (77.5%), out of which 60(41.1%) continued on outpatient bases at the physiotherapy department. While a small proportion (44[10.2%]) were discharge against medical advice. This trend was observed in a study by Kawu., *et al.* [18]. Their attributed reason was the high financial implication for SCI treatment, proximity reason and search of non orthodox solution, which is a common problem in developing African countries. The mortality rate observed in this study is low compared to observed mortality in other studies [33-37].

## Conclusion

The pattern of SCI from this study showed that RTA is the most common cause affecting mostly young male. The cervical injury was the most implicated in this study and appreciable amount of patient discharged from the ward continued rehabilitative management.

## Conflict of Interest

No conflict of interest in this study.

## Bibliography

1. Harvey LA. "Physiotherapy rehabilitation for people with spinal cord injuries". *Journal of Physiotherapy* 62.1 (2016): 4-11.
2. Saboe LA., *et al.* "Spinal trauma and associated injuries". *Journal of Trauma* 31 (1991): 43-48.
3. Thurmann DJ., *et al.* "Surveillance of spinal cord injury in Utah, USA". *Paraplegia* 32 (1994): 665-669.
4. Thuret S., *et al.* "Therapeutic interventions after spinal cord injury". *Nature Reviews Neuroscience* 7 (2006): 628-643.
5. Ackery A., *et al.* "A globalperspective on spinal cord injury epidemiology". *Journal of Neurotrama* 21 (2004): 1355-1370.
6. Burt AA. "The epidemiology, natural history andprognosis of spinal cord injury". *Current Orthopaedics* 18 (2004): 26-32.
7. Kawu A., *et al.* "A cost analysis of conservative management of spinal cord-injured patients in Nigeria". *Spinal Cord* 49 (2011): 1134-1137.
8. DeVivo M and Stover S. "Long term survival and causes of death". in Stover SL, DeLisa JA, Whiteneck GG (eds): *Spinal Cord Injury: Clinical Outcomes from the Model Systems*. Gaithersburg, Md, Aspen Publishers, (1995): 100-119.
9. Myers J., *et al.* "Cardiovascular disease in spinal cord injury: an overview of prevalence, risk, evaluation, and management". *American Journal of Physical Medicine and Rehabilitation* 86 (2007).
10. Okonkwo CA. "Spinal cord injuries in Enugu, Nigeria: preventable accidents". *Paraplegia* 1 (1998): 12-18.
11. Oyesiku NM. "Cervical Spine Immobilization before Admission to the Hospital". *Neurosurgery* 50 (2002): S7-17.
12. World Health Organization (2013).
13. Nwankwo OE and Katchy AU. "Outcome of a 12-week programme for management of the spinal cord injured with participation of patient's relations at Hilltop Orthopaedic Hospital, Enugu, Nigeria". *Spinal Cord* 41 (2003): 129-133.
14. Obalum DC., *et al.* "Profile of spinal injuries in Lagos, Nigeria". *Spinal Cord* 47 (2009): 134-137.
15. Draulans N., *et al.* "Aetiology of spinal injuries in Sub-Saharan Africa". *Spinal Cord* 49 (2011): 1148-1154.
16. Garshick E., *et al.* "A prospective assessment of mortality in chronic spinal cord injury". *Spinal Cord* 43 (2005): 408-416.
17. Udosen A., *et al.* "A Prospective Study Of Spinal Cord Injury In The University Of Calabar Teaching Hospital, Calabar, Nigeria: A Preliminary Report". *The Internet Journal of Orthopedic Surgery* 5.1 (2006).
18. Kawu AA., *et al.* "Outcome of conservative treatment of spinal cord injuries in Lagos, Nigeria". *Nigerian Journal of Orthopaedics and Trauma* 9 (2010): 21-23.
19. Nwadinigwe CU and Ugezu AI. "Management of penetrating spinal cord injuries in a non spinal centre: Experience at Enugu, Nigeria". *Nigerian Journal of Medicine* 17 (2008): 205-209.
20. Neumann CR., *et al.* "Risk factors for mortality in traumatic cervicospinal cord injury: Brazillian data". *Journal of Trauma* 67 (2009): 67-70.

21. Solagberu BA. "Spinal cord injuries in Ilorin, Nigeria". *West African Journal of Medicine* 21.3 (2002): 230-232.
22. Odeku EI and Richard R D. "Peculiarities of Spina Trauma in Nigeria". *West African Medical Journal* 20 (1971): 211-225.
23. Ebong W W. "Fall from trees". *Tropical Medicine and Global Health* 30 (1978): 63-67.
24. Levy LF, et al. "Problems, struggles and some success with spinal cord injury in Zimbabwe". *Spinal Cord* 36 (1998): 213-218.
25. Gosselin RA and Coppotelli C. "A follow-up study of patients with spinal cord injury in Sierra Leone". *International Orthopaedics* 29 (2005): 330-332.
26. Roohi SA, et al. "Spinal injury in a level-one trauma centre: demographic study". *Medical Journal of Malaysia* 61 (2006): 30-35.
27. O'Connor RJ and Murray PC. "Review of spinal cord injury in Ireland". *Spinal Cord* 44 (2006): 445-448.
28. Leonard H Joseph, et al. "Three-year study of spinal cord injury outcomes and related secondary complications in a tertiary centre - a retrospective analysis". *Archives of Medical Science* 5.2 (2009): 190-194.
29. William O McKinley, et al. "Nontraumatic Spinal Cord Injury: Incidence, Epidemiology and Functional Outcome". *Archives of Physical Medicine and Rehabilitation* 80 (1999).
30. Imle PC, et al. "The physical therapists role in the early management of acute spinal cord injury". *Top Acute Care Rehabilitation* 1.3 (1987): 32-47.
31. Sheel AW, et al. "Respiratory management following spinal cord injury". In: Eng JJ, Teasell RW, Miller WC, et al., editors. *Spinal Cord injury Rehabilitation Evidence*. Vancouver, BC:ICORD Press (2006): 8.1-8.3.
32. Harvey L. "Respiratory management". In: Anonymous, editor. *Management of spinal cord injuries: A guide for Physiotherapist*. Vol 1. New York: Elsevier Ltd (2008): 205-225.
33. Enel J. "Management of Patient with Spinal Cord Injury". *JAMA* 174.10 (1960): 1263-1265.
34. Iwegbu CG. "Traumatic paraplegia in Zaria, Nigeria: the case for a centre for injuries of the spine". *Paraplegia* 2 (1983): 81-85.
35. Silver J R and William S J. "Initial management of spinal injury". In: *Current Surgical Practice Volume 4*. Hadfield J, Hobsley M, editors. London; Edward Arnold (Publishers) Ltd. (1989): 60-79.
36. Torlincasi AM and Waseem M. "Cervical Injury". In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing (2020).
37. Umaru H and Ahidjo A. "Pattern of spinal cord injury in Maiduguri, North Eastern Nigeria". *Nigerian Journal of Medicine* 3 (2005): 276-278.

**Assets from publication with us**

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

Website: [www.actascientific.com/](http://www.actascientific.com/)

Submit Article: [www.actascientific.com/submission.php](http://www.actascientific.com/submission.php)

Email us: [editor@actascientific.com](mailto:editor@actascientific.com)

Contact us: +91 9182824667