

Five-Year Review of the Pattern and Outcome of Management of Spinal Diseases Seen at St. Mary's Hospital Lacor in Uganda.

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Background: *Spinal cord injury or lesion is a devastating event with social, psychological and physical ramifications that has dehumanizing experiences. The aim of this study was to describe the biographic, etiological factors and outcome of patients with spinal lesions cared for at St Mary's hospital Lacor within a 5yrs period.*

Methods: *Through a 5yrs review of data of paralyzed patients admitted and treated at St Mary's hospital Lacor from Jan 2009 to Dec 2013, the following secondary data was extracted and analyzed using SPSS version 15: Age, sex, duration of hospitalization, type of paralysis, cause of the spinal lesion, vertebral lesion, outcome and recovery of neurological function.*

Results: *Approximately 241 met the criteria analysis, the mean age for spinal lesion was 31 years, average duration of hospitalization was 61 days and the Male gender predominated (64.3%) compared to the females (35.7%), P-value 0.000. Paraplegia was the commonest form of neurological deficit (79.67%) followed by tetraplegia (13%), P-value 0.000. TB spine is the leading cause of spinal lesion (19%) followed by road traffic accidents (17%) and lymphoma (15.8%). In 16.6% of the patients, the etiology of the spinal cord lesion was not known. Spinal lymphoma lesion was common in pediatric age group compared to TB spine and traumatic spinal lesion (p-value 0.000). Out of the 241 cases studied, 73 (30.3%) recovered their limb function completely and were reintegrated into the community. However 39 (16.2%) died from the lesions and/or the associated complications.*

Conclusions and Recommendation: *Spinal lesions are commonest in young male populations with a mean age of 31 years. TB Spine, RTA and falls represent the commonest etiological factors in youth and adults while lymphomas lead in children. Approximately 30% of spinal lesion recovered and 16% died. The health facilities should consider setting up spinal care units.*

Key words: Pattern, Outcome, Management, Spinal Diseases

Introduction

Spinal cord injury and its consequential neurological dysfunction is a very costly catastrophic event with social, psychological and physical ramifications. Complications, re-hospitalization and death rates accruing from it is quite high yet due to potentially treatable conditions. Indeed only 41% of the traumatic Spinal Cord Injury (SCI) improves in their neurological status, hence 59% remain paralysed¹. The prevalence of spinal injuries ranges from 236 per million in India to 1800 per million in the USA with the most common cause being traffic accidents and falls². The global-incident rate (2007) estimates; North America has 40 per million, Western Europe 16 per million, Sub-Saharan Africa-East 21 per million respectively and falls from trees, balconies, flat roofs and construction sites dominate the cause³. However gunshot injuries tops the causes of spinal cord

trauma (36%) in South Africa, followed by motor vehicle accidents (MVA) (25%), stab wounds (20%) and falls from heights (2.4%)⁴.

On the other hand, Non Traumatic Spinal Cord Lesion (NTSCL) constitutes 60% of the total Spinal Cord Lesion (SCL) of which Spinal tumors account for 26.6%, followed by Pott's spine (25%) and transverse myelitis (22%)⁵. However, Owolabi, Ibrahim and Samaila (2011) reported the etiology of non-traumatic paraplegia, consist of tuberculosis (TB) (44.4%), transverse myelitis (13.1%), Guillain-Barre syndrome (9.1%), metastatic spinal disease (4%), and HIV myelopathy (4%) and in (14%) of the patients, the cause could not be identified⁶. Tuberculosis (TB) of the spine is an important factor because it predominates in immune-compromised and HIV who often present with extra-pulmonary tuberculosis. Half of the patients with extra-pulmonary TB tend to develop infection within the spinal column⁷. In TB spine, the thoracic region of vertebral column is most frequently affected but incidence of multi-level noncontiguous vertebral tuberculosis also occur frequently⁸.

The peak age of SCI in Denmark is 15-24 years of age⁹ while according to Wyndaele and Wyndaele (2006) the mean age of patients sustaining spinal injury is 33 years, and the sex ratio (men/women) being 3.8:1 in Belgium¹⁰. In Turkey; Male to female ratio is 2.5:1 and the average age at injury being 35.5+/-15.1¹¹. In India, Mean age for spinal lesion is 30.64±13.67 years and, duration of illness ranges 7.09±9.15 months respectively⁵. In South Africa, most of the patients with paraplegia are in the age group 20-29 years and trauma account for 89% of all spinal cord lesions⁴. In Non traumatic paraplegia, the age range of the patients with paraplegia lies between 16 and 76 years, with a mean age of 40 years (SD = 15.3) years⁶. Therefore, spinal lesions tend to dominate in male in their 30s.

Many health facilities in Uganda have no dedicated team or unit to care for this cadre of patients who are often in dire sorry state thus leaving them to the mercy of death and the community. But St Mary's Hospital Lacor which is a rural 484 bed health facility and a University teaching hospital located in Northern Uganda has been caring for paralyzed patients for the last 7 years. However there is limited information on the profile, care and outcome of spinal lesion in a rural hospital like ours hence the need to do the study.

The Objectives of this study were to examine the biographic characteristic of paraplysed patients and its etiological factor from 2009 to 2013 at St. Mary's Hospital Lacor and to determine the outcome of spinal lesions care within the same period

Patients and Methods

This was a 5 years descriptive study designed to review paralyzed patients admitted and treated at St Mary's hospital Lacor from January 2009 to December 2013. All cases of spinal lesion admitted and treated in the hospital within the period were included but re-hospitalization and cases with incomplete information were excluded.

The following variable were examined and extracted as secondary data for analysis: Age, Sex, Duration of hospitalization, Type of Paralysis, Cause of the spinal lesion, spinal lesion, outcome and Recovery of neurological function. Data collected was entered and analyzed using SPSS version 15.

Results

Within the study period, 288 patients were admitted and treated in the hospital, out of which 241 (84%) were enrolled in the study. Generally the average duration of hospitalization for patients admitted with spinal cord lesion was 61 days, (Mode 7days, Range 1-1772days).

Age and Gender

As shown in Table 1, Out of the 214 spinal cord lesion seen in the 5yrs reviewed, Youth (19-35yrs) constituted 31.5%, followed by Adults (36-65yrs) 27.4%, Pediatrics (age 0-11yrs) constituted 19.1%, Adolescent (12-18yrs) 13.7%, and Elderly (>66yrs) 8.3%. Therefore the youth were the most common age group who suffered spinal cord lesion. However, the mean age for spinal lesion was 31yrs SD+/- 20.26. Regarding gender distribution of spinal lesion, the males were 155, (64.3%) n=241 and the female gender 86 (35.7%), n=241 and this difference was statistically significant (P-value 0.000). Hence it can be inferred that spinal lesion predominantly occur in males. This has implication in the rural community, because the male gender is often the provider and bread winner for their family.

As seen in Figure 1, paraplegia was the most frequent form of neurological deficit amongst those admitted and treated for spinal cord lesion. It comprised approximately 80%, n=241 amongst those treated in the 5years, followed by tetraplegia (13%), paraparesis (6%) and tetraparesis (1%), [Chi square 390.685, P-value 0.000]. Therefore paraplegia is a significant cause of morbidity amongst patients of spinal cord lesion. This has implication on bowel and bladder dysfunction thus increasing the amount and intensity of care levied on the care takers

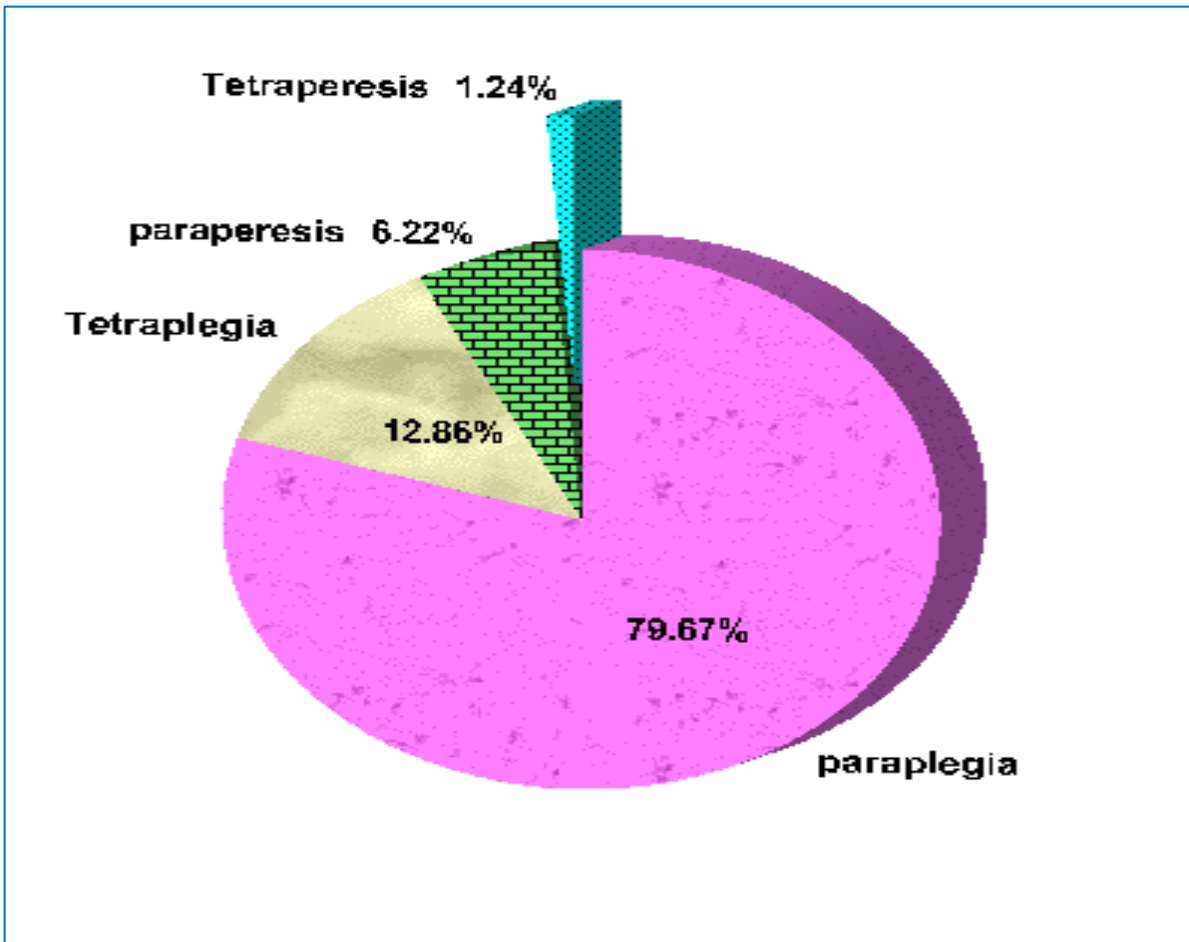


Table 1. Age and Gender of Spinal Cord Lesion

Age in Years	Sex					
	Male		Female		Total	
	No	%	No	%	No	%
Pediatrics (0-11yrs)	28	18.1	18	20.9	46	19.1
Adolescents (12-18yrs)	20	12.9	13	15.1	33	13.7
Youth (19-35yrs)	52	33.0	24	27.9	76	31.5
Adults (36-65Yrs)	37	23.9	29	33.7	66	27.4
Elderly (>66Yrs)	18	11.6	2	2.3	20	8.3
Total	155	100	86	100	241	100

Table 2. Aetiology of Spinal Lesion

Aetiology	Frequency	Percent (%)
TB spine	45	18.7
Lymphoma	38	15.8
Gullen Barry Syndrome (GBS)	2	0.8
Transverse myelitis	4	1.7
Degenerative Spondylosis	9	3.7
Fall from Height	31	12.9
Road Traffic Accident (RTA)	41	17
Gun Shot Wounds (GSW)	1	0.4
Spinal tumor	8	3.3
Spinal Shock	1	0.4
Toxoplasmosis	2	0.8
Unknown	40	16.6
Prolapsed intervertebral disc	2	0.8
Work Accident	1	0.4
HIV neuropathy	1	0.4
Assault	5	2.1
Metastatic cancer to spine	9	3.7
Spina Bifida	1	0.4
Total	241	100

Type/ Severity of Paralysis

Etiology of spinal lesion

From Table 2, approximately 19% (n=241) had spinal lesion attributable to extra-pulmonary Tuberculosis (TB) involving the spinal cord, this was followed by Road Traffic Accident (RTA) 17% (n=241). Patients whose etiology of spinal lesion is unknown was 16.6%, n=241, followed lymphoma (15.8%), fall from height (13%) and degenerative vertebral spondylosis (3.7%). Therefore TB spine is the leading cause of spinal lesion in our unit.

Table 3. Aetiological Factor and Age

Diagnosis of patient		Age					Total
		Pediatrics	Adolescents	Youth	Adults	Elderly	
TB spine	n	4	2	18	20	1	45
	(%)	8.7%	6.1%	23.7%	30.3%	5.0%	18.7%
Lymphoma	n	27	11	0	0	0	38
	(%)	58.7%	33.3%	0.0%	0.0%	0.0%	15.8%
GBS	n	1	0	1	0	0	2
	(%)t	2.2%	0.0%	1.3%	0.0%	0.0%	0.8%
Disc prolapse	n	0	0	1	0	0	1
	(%)	0.0%	0.0%	1.3%	0.0%	0.0%	0.4%
Transverse myelitis	n	0	1	2	1	0	4
	(%)	0.0%	3.0%	2.6%	1.5%	0.0%	1.7%
Degenerative spondylosis	n	0	0	0	3	6	9
	(%)	0.0%	0.0%	0.0%	4.5%	30.0%	3.7%
Fall	n	2	7	15	7	0	31
	(%)	4.3%	21.2%	19.7%	10.6%	0.0%	12.9%
RTA	n	2	2	18	16	3	41
	(%)	4.3%	6.1%	23.7%	24.2%	15.0%	17.0%
GSW	n	0	0	1	0	0	1
	(%)	0.0%	0.0%	1.3%	0.0%	0.0%	0.4%
Spinal tumor	n	2	2	3	1	0	8
	(%)	4.3%	6.1%	3.9%	1.5%	0.0%	3.3%
Spinal Shock	n	1	0	0	0	0	1
	(%)	2.2%	0.0%	0.0%	0.0%	0.0%	0.4%
Toxoplasmosis	n	0	0	1	1	0	2
	(%)	0.0%	0.0%	1.3%	1.5%	0.0%	0.8%
Unknown	n	5	6	14	11	4	40
	(%)t	10.9%	18.2%	18.4%	16.7%	20.0%	16.6%
Disc Proplase	n	0	0	0	1	0	1
	(%)	0.0%	0.0%	0.0%	1.5%	0.0%	0.4%
Work Accident	n	0	1	0	0	0	1
	(%)	0.0%	3.0%	0.0%	0.0%	0.0%	0.4%
HIV neuropathy	n	0	0	0	1	0	1
	(%)	0.0%	0.0%	0.0%	1.5%	0.0%	0.4%
Assault	n	1	1	1	1	1	5
	(%)	2.2%	3.0%	1.3%	1.5%	5.0%	2.1%
Spinal Metastasis	n	0	0	1	3	5	9
	(%)	0.0%	0.0%	1.3%	4.5.0%	25.0%	3.8%
Spina Bifida	n	1	0	0	0	0	1
	(%)	2.2%	0.0%	0.0%	0.0%	0.0%	0.4%
Total	n	46	33	76	66	20	241
	(%)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Another important etiological factor worth noting from the Table 2 is metastatic cancers from the breast and prostate which accounts for 3.7% and Degenerative vertebral spondylosis (3.7%) respectively.

Table 3 shows that when the etiological factors are disaggregated by age of patients, it is observable that Lymphoma is the commonest factor leading to admission for spinal lesion in pediatric age group (0-11yrs). Significantly however, lymphoma accounts for 59% of paralysis seen in that age group, while TB spine, Road Traffic accidents (RTA), and fall from height predominate in youth 19-35yrs and adults (36-65yrs), *P-value 0.000*. However TB spine alone account for 23.7% of spinal lesion in the youth and 30.3% in adults. RTA on the other hand accounted for 23.7% in the youth spinal lesion followed by falls 19.7%. In adults however RTA accounted for 24.2% of spinal lesions and falls 10.6%. Therefore, whereas lymphoma is more common in pediatrics, TB spine is common in Adults while fall from height s predominate in the youth.

Considering Table 4, it is observable that 140 (58%) out of total 241 patients had no vertebral lesion demonstrable on plain radiograph, while 47 (20%, n= 241) patients had thoracic spine fracture, 35 (15%, n-241) had lumbar fracture, 18 (7.5%) cervical fracture and sacral 1 (0.4%), *P-value 0.000*. On further analysis, it is conceivable that most pediatric patients have no demonstrable lesion on radiograph compared to the youth and adults (*P-value 0.000*).

Table 4. Age Group and Spinal Vertebral Lesion

Age Group		Spinal Lesion					Total
		Lumbar #	Thoracic #	Sacral #	Cervical #	No Fracture	
Pediatrics	n	0	3	0	0	43	46
	(%)	.0%	6.4%	.0%	.0%	30.7%	19.1%
Adolescents	n	6	2	1	2	22	33
	(%)	17.1%	4.3%	100.0%	11.1%	15.7%	13.7%
Youth	n	17	22	0	5	32	76
	(%)	48.6%	46.8%	.0%	27.8%	22.9%	31.5%
Adults	n	8	18	0	10	30	66
	(%)	22.9%	38.3%	.0%	55.6%	21.4%	27.4%
Elderly	n	4	2	0	1	13	20
	(%)	11.4%	4.3%	.0%	5.6%	9.3%	8.3%
Total	n	35	47	1	18	140	241
	(%)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 5. Outcome of Spinal Lesion Care

Neurology Status	Frequency	Percent (%)
No Recovery	129	53.5
Died	39	16.2
Recovered Limb Function	73	30.3
Total	241	100

This finding relates to the fact that most pediatric spinal lesion are attributable to Burkitts lymphoma which affect the cord while in youth and adults where TB spine, RTA and Falls from height predominate, radiological evidence of fracture spine is more likely.

Whereas 39 (16.2%) out of the 241 patients who were admitted with spinal lesion in out unit died, 73 (30.3%, n=241) recovered their limb function and were reinstated back in to productive life in the community (Table 5). However despite inpatient care, bed rest, physiotherapy, 53.5%, (n=241) did not recover and they were allowed home bound to wheel chair, entirely dependent on their relatives to care for them. Follow-up by a community worker were done occasionally

Discussion

The study consisted of a 5yrs records review of all patients admitted and treated with spinal cord lesion at St Mary's Hospital Lacor, within the period 2009-2013 inclusive. The mean age for spinal lesion was found to be 31yrs (SD+/- 20.26) with a significant male predominance amongst spinal lesion compared to the female counterpart. Similar findings were separately reported in Belgium by Wyndaele¹⁰ in India by Gautam, Karki and Rijal⁵ and Turkey by Karacan, Koyuncu, Pekel, Smblođlu, Kirnap, et al¹¹. The age of 31ys reflects the level of vigorous and risky activities that could predispose the male gender to spinal injuries and HIV. This age group of 30s also constitute the most productive cluster whom the family is dependent.

As shown in Figure 1, paraplegia was the most common presentation of spinal lesion followed by tetraplegia, paraparesis and finally tetraparesis, (*P-value 0.000*). This finding suggests that most of the patient presenting to our unit had spinal lesion within the thoracic or lumbar vertebra. Most TB lesions often affect the thoracic and lumbar vertebra. However a meta-analysis by Ning, Wu, Li and Feng¹² found the proportion of paraplegic individuals varied between 18 and 91.97%, and that of quadriplegic individuals ranged from 8.03 to 82% in spinal lesion¹². This study findings is within the same range. The high prevalence of paraplegia has implication on bowel as well as bladder care and the attaining risk of urinary tract infection.

Considering the Non-Traumatic cause of spinal lesion, TB spine was the leading cause of morbidity due to spinal cord lesion in our unit (19%, n=241), followed by patients whose etiology of spinal lesion is unknown (16.6%, n=241) and lymphoma (15.8%). This finding is similar to the 25% Pott's spine rate reported by Gupta, Taly, Srivastava and Murali⁵. TB spine is extra-pulmonary tuberculosis which tend to affect HIV and immune-compromised patients⁷. However, HIV test was not routinely done on patients with spinal lesion in our unit.

The finding of 16.6% spinal lesion whose etiology could not be traced is similar to the 14% rate reported by Owolabi *et al*⁶ in Nigeria. However amongst the spinal lesion 585 could not be evident on radiographs. This is perhaps due to the high prevalence of Lymphoma which is however common in children with stage D Burkitts lymphoma. Lymphomas tend to affect the leptomeninges other than the vertebral bone.

Amongst the Traumatic spinal lesions, Road Traffic Accident (RTA) was the most common (17%, n=241) followed by fall from height (13% n=241). In a study in Turkey, it was concluded that, RTA and falls were the leading cause of traumatic spinal lesion¹¹. This calls for the introduction of general and standard speed limits and compulsory seat belt wearing in the region. Unlike other parts of the world, falls in our study setting were mostly from mango trees.

From Table 3, whereas lymphoma significantly accounted for paralysis seen in pediatric age group, TB spine, Road Traffic accidents (RTA), and fall from height predominate in youth 19-35yrs and adults (36-65yrs), *P-value 0.000*. Pediatric lymphomas are mostly of the Burkitts lymphoma (BL) type. In fact BL is the commonest pediatric lymphoma and its incidence rates have increased from 9.5 per 10⁶ to 34.3 per 10⁶ in Uganda¹³. Furthermore, the high proportion of non-radiologically evident lesion on the vertebrates of pediatric patients is perhaps related to meningeal infiltration by the lymphoma cells. Leptomeningeal metastasis of BL was also reported by Saini, Gujral, Tripathi, Sharma, Kumar, *et al*¹⁴.

TB spine however is more common in youth (19-35yrs) and adults 36-65yrs) which is also the more predisposed to HIV/AIDS. The thoracic region of vertebral column is most frequently affected but incidence of multi-level noncontiguous vertebral tuberculosis occurs more frequently¹⁵. However traumatic injuries like fall and RTA also tend to occur in the most active age group (youth and adult) and the trauma tends to fracture the vertebral column so as to cause paralysis.

To the best of our knowledge, only few humans recover their neurological function after sustaining spinal cord lesion. The 30.3% recovery rate in our setting is encouraging hence many health facilities should invest in caring for these desperate patients. The mortality rate of 16.2% in this study is comparable to the mortality range of 4.4% to 16.7% reported by Krause by Varma; Hill, Nicholas and Selassie¹⁶. In patients with traumatic spinal cord injuries lethality is higher compared with the normal population and the main causes of death are attributable to respiratory problems, heart disease and suicide².

Conclusion and Recommendation

Spinal cord lesion is common in young male patients of mean age 31yrs and TB spine, RTA and falls represent the commonest etiological factor responsible for spinal lesion in youth and adults while lymphoma leads in children. Care and follow up of patients with spinal lesion is rewarding because 30% of them recover their neurological function and only 16% die but also from treatable complication. Therefore health facilities in the country should consider setting spinal units in the locations.

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