



SPECTRUM OF SPINAL TRAUMA AT THE NATIONAL ORTHOPAEDIC HOSPITAL, LAGOS, NIGERIA

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ABSTRACT

Background: Spinal trauma is a leading cause of morbidity and mortality, particularly in young adults. Despite advances in prevention and treatment, spinal trauma continues to pose a major public health challenge. This study aims to assess the Incidence and Spectrum of Spinal Trauma at the National Orthopaedic Hospital Igbobi, Lagos, Nigeria from the year 2019 to 2022. The study assessed the trends in the incidence of spinal trauma overtime and examined the demographic distribution and clinical diagnosis of spinal traumas.

Methods: Data was collected retrospectively from the Magnetic Resonance Imaging (MRI) medical records of 86 patients who had been diagnosed with spinal trauma. Data obtained from the study was analyzed using the Statistical Package for Social Sciences (SPSS) version 25.0.

Results: The results showed that patients ages were between 8 to 87 years (Mean \pm SD = 36.67 \pm 15.06). The frequency of spinal trauma in males 53(61.6%) and females 33(38.4%). A high incidence of spinal trauma 26(29.55%) was found within the age bracket of 21-33 years, followed by 34-46 years which accounted for 21(23.86%). The most common level of injury was found in the cervical spine 38(44.19%), followed closely by lumbosacral spine 31(36.05). The most frequent causes of spinal trauma were RTA 30(34.88), followed by fall 17(19.77%). The highest frequency of clinical diagnosis was found in fractures (26.74%), followed by spondylosis 14(16.28%).

Conclusion: The study revealed a higher proportion of spinal trauma in males than their female counterpart, and mostly in younger individuals in their second decade of life.

KEYWORD: Spinal, Trauma, Spectrum, MRI, Injuries, RTA.

INTRODUCTION

Injuries to the spine can affect a range of structures, from the vertebrae to soft tissues and the spinal cord. Injuries that impact the spinal cord are particularly severe. Spinal trauma refers to any damage to the spinal cord that leads to a change, whether temporary or permanent, in its normal motor, sensory, or autonomic functions (Devivo, 2002). It is considered one of the most severe conditions that can be encountered by patients and often leads to severe, long-term disability.

Spinal injuries have a significant impact on young people, resulting in significant health issues and substantial human and economic losses. This is due to the fact that many victims are left with permanent disabilities and may need specialized care for the rest of their lives (NSCISC, 2021).

It is estimated that there are 40, 000 patients in the UK with spinal injuries, giving a prevalence of 1 in 1500 (0.7%). There are about 800 new patients presenting with spinal injuries annually in the UK, (Green, 2003) whereas in the United States 30–60 new cases per million or 10, 000 new cases per year are recorded (Priebe, 1991).

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Annual incidence of spinal injuries is also reported as 16.9 per million of population in southeast Turkey and 18.8 in Taiwan (Hung, 1997).

In Nigeria, there is a scarcity of data on the incidence and prevalence of spinal injuries due to the absence of case registries at the local, state, and federal levels. Also, census figures in Nigeria are often disputed, making it challenging to conduct studies based on the population to generate data for comparison with other countries.

Spinal trauma is a life-threatening condition that can disrupt a person's life in significant ways. However, with advances in medical care and technology, people with spinal trauma in high-income countries often have a good chance of surviving, living a full life, and even thriving. This is due to improved emergency response, effective health and rehabilitation interventions, technologies such as respirators and wheelchair, social services and accessible environments.

In contrast, in low-income countries, like Nigeria, spinal trauma is often a terminal condition, with most people dying within a few years of injury. This is due to the lack of quality assistive devices, minimal medical and rehabilitation services, and limited opportunities for participation in personal and social life. However, the progress that has been made in high-income countries in a relatively short period of time gives hope that similar progress can be made in other parts of the world with the right policy responses. Policy changes and prioritizing prompt an effective medical response and sustained rehabilitation to support full integration into community life are both cost-effective and socially beneficial. Immediate emergency and medical care can save lives and offset cost, and investing in rehabilitation can help younger individuals with spinal trauma who have many productive years ahead, maintain their quality of life

and productivity, thereby avoiding social and economic waste.

To effectively address the challenges faced by people with spinal trauma, it is important to understand the different patterns of these traumas and most likely site in order to look out for them and plan management pathways for prompt recovery. This study sought to evaluate the spectrum of spinal trauma at the national orthopaedic hospital in Lagos, Nigeria

MATERIALS/METHODS

The research was carried out using retrospective study design, focusing on the incidence and spectrum of spinal trauma. Data was collected from Magnetic Resonance Imaging request forms of patients who presented to the Radiology department with spinal trauma. The study was limited to the National Orthopaedic Hospital, Lagos, Nigeria. During the study, Magnetic Resonance images and reports showing spinal trauma were studied.

The population included all patients who were brought to the hospitals with spinal trauma. This includes all cases reported within the study period (January 2019-December, 2022). A sample size of 86 cases of MRI reports of patients with queried spinal trauma and definitive diagnosis were obtained.

Data was collected on demographic features of the patients such as age, gender, clinical indication and diagnosis/impression. The data from the medical records of patients who met the inclusion criteria were collected and analyzed.

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) software version 25.0. Descriptive statistics were calculated for demographic variables. Spectrum of spinal injuries was described using frequencies and percentages. The Chi-square test was used to compare categorical variables. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1: Gender distribution of cases

| Gender | Frequency | Percentage |
|--------|-----------|------------|
| Male | 53 | 61.6 |
| Female | 33 | 38.4 |
| Total | 86 | 100 |

Table 1 shows that 61.6% of the spinal trauma cases were seen in males while 38.4% were seen in females.

Table 2: Age distribution of cases

| Age range | Frequency | Percentage |
|-------------|-----------|------------|
| 8-20 years | 8 | 9.3 |
| 21-33years | 33 | 38.4 |
| 34-46 years | 26 | 30.2 |
| > 47 years | 19 | 22.1 |
| Total | 86 | 100 |

Table 2 shows that 26(29.6%) patients were aged 34-46 years with the peak incidence 21-33 years accounted for 33(37.5%) patients with spinal trauma.

The mean age of patients with spinal trauma is 36.67 years.

Table 3: Distribution of spinal injuries by spinal region

| Region | RTA | Fall | Paraplegia | Paraparesis | Cauda equine syndrome | Cervical myelopathy | stenosis | Spinal tumour | Assault | Low back pain | Radiculopathy | Spinal bifida occulta |
|-----------------|-----|------|------------|-------------|-----------------------|---------------------|----------|---------------|---------|---------------|---------------|-----------------------|
| Cervical | 16 | 12 | 1 | 2 | 1 | 2 | 0 | 0 | 1 | 0 | 1 | 0 |
| Thoracic | 6 | 3 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 |
| Lumbosacral | 7 | 1 | 9 | 2 | 0 | 0 | 2 | 0 | 1 | 4 | 7 | 0 |
| Cervicothoracic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Thoracolumbar | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total | 30 | 17 | 11 | 4 | 2 | 2 | 2 | 3 | 2 | 4 | 8 | 1 |

Table 3 shows that the highest cause of spinal injury in the cervical and thoracic spine is RTA, followed by fall. The highest cause of spinal injury in the lumbosacral spine is paraplegia, followed by RTA. The least cause of spinal injury in the cervical injury in the

spine are assault, cauda equine syndrome, radiculopathy and paraplegia. The least cause of spinal injury in the thoracic spine are cervical myopathy and spinal tumor, while for lumbosacral spine is assault and fall.

Table 4: Distribution of spectrum and frequency of clinical indications in the study

| Indication | Frequency | Percent (%) |
|-----------------------|-----------|-------------|
| RTA | 30 | 34.88 |
| Paraplegia | 11 | 12.79 |
| Spinal tumour | 3 | 3.49 |
| Radiculopathy | 8 | 9.30 |
| Spinal bifida occulta | 1 | 1.16 |
| Paraparesis | 4 | 4.65 |
| Low back pain | 4 | 4.65 |
| Fall | 17 | 19.77 |
| Cervical myelopathy | 2 | 2.33 |
| Cauda equina syndrome | 2 | 2.33 |
| Canal stenosis | 2 | 2.33 |
| Assault | 2 | 2.33 |
| Total | 86 | 100 |

Table 4 shows the frequency and percentage of the leading cause of spinal injury in the study. RTA had the highest frequency 30(34.88%), followed by fall 17(19.77%), paraplegia accounted for 11(12.79%).

Table 5: Distribution of spectrum of spinal trauma

| Diagnosis | Frequency | Percent |
|--------------------------------|-----------|---------|
| Spondylolisthesis | 12 | 13.95 |
| Fractures | 23 | 26.74 |
| Hemorrhage contusion | 1 | 1.16 |
| Extramedullary extradural mass | 1 | 1.16 |
| myelomalacia | 3 | 3.49 |
| Osteoporosis | 3 | 3.49 |
| Cervical injury | 10 | 11.63 |
| Spondylosis | 14 | 16.28 |
| Pott's disease | 1 | 1.16 |
| Spinal bifida occulta | 1 | 1.16 |
| Spinal cord contusion | 2 | 2.33 |
| Spinal canal stenosis | 8 | 9.30 |
| Syrinx | 1 | 1.16 |
| Thoracic cord hematoma | 2 | 2.33 |
| Spinal cord edema | 2 | 2.33 |
| Intramedullary intradural mass | 1 | 1.16 |
| Total | 86 | 100 |

The table shows frequency of clinical diagnosis of spinal trauma. The highest frequency was fracture 23(26.74%), spondylosis accounted for 14(16.28%), Spondylolisthesis accounted 12(13.95%)

DISCUSSION

This study reveals that spinal cases were more in males, almost two-fold the proportion observed in females (Table 1). The higher prevalence of spinal trauma in males could be as a result of their more physically active nature than women, and engages in more high-risk activities, which increase their chances of sustaining a spinal injury. This result has been reported in a previous study (Holmes et al., 2019). Alternatively, it could indicate that males may be more likely to engage in behaviors that increase their risk of spinal trauma, such as risky driving or sports activities. The highest incidence of spinal injury occurred in subjects aged 21-33 years, whereas, the least incidence occurred in patients aged 8-20 years (Table 2). This suggests that individuals in their early adulthood ages are at a higher risk of spinal injury. This may be attributed to the fact that individuals in this age group tend to be more active and involved in activities that may lead to spinal injury, such as sports, accidents or exposure to risky behaviors. A previous study had reported similar outcomes (Holmes et al., 2019). The proportion of spinal injury in the age group of patients aged 34-46 years surpassed that for patients aged >47. This could be due to the fact that individuals in this age group may not be as active as those in their early adulthood, but are still at risk of spinal injury due to aging factors which can weaken bones and cause degenerative changes (Obalum et al., 2009).

Table 3 indicates the frequency and distribution of spinal injuries across different regions of the spine. The data shows that the cervical spine has the highest incidence of spinal injuries, accounting for 44.19% of all injuries, followed by the lumbosacral region at 36.05%. This suggests that the cervical spine is the

most vulnerable region of the spine and more prone to injury than other regions. this outcome is in consonance with a study conducted in Lagos (Obalum et al., 2009). The cervicothoracic region has the lowest frequency of spinal injury, with only one case accounting for 1.16%. This could suggest that this region is relatively less vulnerable to spinal injuries. The thoracic spine and thoracolumbar spine have a relatively lower frequency of spinal injury compared to the cervical and lumbosacral regions, accounting for 12.79% and 5.81%, respectively. This suggests that these regions of the spine may be less prone to injury compared to the cervical and lumbosacral regions.

Table 4 shows the causes of spinal injury across different regions in the spine. The data reveals that RTA is the leading cause of spinal injury in the cervical spine, thoracic spine and thoracolumbar region. This highlights the importance of road safety measures to prevent such injuries. The second highest of spinal injury is fall in the cervical and thoracic spine, indicating that falls need to be taken seriously. The highest cause of spinal injury in the lumbosacral spine is paraplegia, which underscores the severe impact of spinal injuries in this region.

Table 5 provides information on the frequency and clinical indications of spinal injury in the study. The data shows that the most common cause of spinal injury in the study is Road Traffic Accidents (RTA) which accounted for 34.88% of cases. This is followed by falls, which accounted for 19.77% of cases. The other causes of spinal injury in the study include paraplegia (12.79%), radiculopathy (9.30%), paraparesis and low back pain (4.65%), spinal tumor (3.49%), cervical myelopathy, cauda equina syndrome, canal stenosis, and assault (2.33%), and spinal bifida occulta (1.16%).

CONCLUSION

The incidence and spectrum of spinal trauma in Lagos state is a growing concern. Spinal trauma is a serious condition with a high degree of morbidity and mortality. The research findings indicate that the most common cause of spinal trauma in Lagos state is road traffic accident, followed by fall. The study also revealed that the majority of the patients affected were young males. These findings demonstrate the need for more comprehensive measures to be put in place in order to prevent spinal trauma. Improved road safety regulations, better access to emergency services and increase public awareness about the risk of spinal injuries are essential to address this problem.

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