



Prevalence and Pattern of Peripheral Nerve Injuries in Kano Metropolis, Nigeria

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SUMMARY

Peripheral nerve injury (PNI) are a worldwide problem and are among the leading cause of disabilities, thereby posing a major social and economic burden in the society. The prevalence of PNI needs to be known for healthcare actions to be taken and implementation of policies, however, such information is not readily available in this part of the world. Therefore, the objective of the study was to determine the hospital-based prevalence and pattern of PNI in Kano metropolis.

The medical records of 28,374 patients who attended five (5) major hospitals in Kano metropolis from 2010-2014 were reviewed in this retrospective study. The records of patients diagnosed with PNI were screened and 454 met the inclusion criteria. A research pro-forma was used to collect the relevant data, including age, gender, injury aetiology, region, nerve affected and referral for physiotherapy. Data was analysed using descriptive statistics of frequency, tables and percentages.

The prevalence of PNI was found to be 1.6%, with males constituting 77.5%. The majority (70%) of the patients were younger than 40 years, and 42% of the PNI were located in the upper limb, with a high prevalence at the ulnar nerve (18%). Motor vehicle accidents (MVA) accounted for the highest number of cases (26.5%). The majority (81.5%) of the patients were not referred for physiotherapy.

The hospital-based prevalence of PNI in Kano metropolis is low, so also is referral for physiotherapy and MVA is the leading cause of PNI.

KEY WORDS: peripheral nerves injuries, prevalence, pattern

INTRODUCTION

Injury to peripheral nerves is a global problem and can result in significant disability (Robinson, 2004). According to the World Health Organization, 3.2 million people become disabled annually due to peripheral nerve injuries (Gin-shaw and Jorden, 2002). Peripheral nerve injuries result in over 8.5 million restricted activity days and almost 5 million bed/disability days each year (Belkas et al, 2004). The exact incidence of peripheral nerve injuries (PNI) is difficult to determine, and underreporting of nerve injury complications is likely because of the limited reported data. In North America, data taken from a trauma population in Canada revealed that approximately 2-3% of patients had a major peripheral nerve injury (Mold et al, 2004). In Italy,

Palma et al (2010) reported a 5% incidence of peripheral nerve injuries. The incidence of iatrogenic peripheral nerve injury in London is around 17.4 - 20% which usually resulted from surgical procedure (Gregor et al, 2014). A study showed the incidence of peripheral nerve injury to be 1.3% in trauma patients (trauma hospitals) in Iran, and the incidence rate of peripheral nerve injuries as 13.9 per 100,000 person years (Saadat et al, 2011). The reported incidence of peripheral nerve injuries among the trauma population in Turkey was 2% to 2.8% and it was 5% if plexus and root lesions were included (Filiz et al, 2009).

Retrospective studies have found that the incidence of permanent peripheral nerve damage in Australia after a surgical procedure and anaesthesia is 0.03% to 1.4%, as

reported by Webster (2012). Also Marina et al (2014) reported a prevalence of 1.12% in traumatic patients in Mexico. Tak et al. (2008) reported a high incidence of PNI due to intramuscular injection in the Kashmir region of India with the sciatic nerve as the most affected (89.7%). In Pakistan, the estimated annual incidence of nerve injuries in traumatic patients was 7.1 per 1 million (Mansoor et al, 2005).

A hospital-based prevalence of facial nerve palsy in Ife (Nigeria) was found to be 0.01% (Folayan et al, 2014). Also, Alonge and Akinwola (2010) reported an incidence of 26.3% of paediatric patients with post-injection sciatic neuropathy out of the 800 patients reviewed in Ibadan (Nigeria).

The effects of peripheral nerve injury vary depending on the cause and severity of the injury (Sonabend et al, 2012). Pain is the major complaint in this type of injury which ranges from tingling to intense burning pain, numbness or altered sensation, muscle weakness in the affected part of the body, loss of function, loss of active movement, joint stiffness and skin sores and finally emotional stress (Campbell, 2008). Neuropathic pain is a direct consequence of a lesion, or disease affecting the somatosensory system (Treede et al, 2008).

Injury to the peripheral nerve affects the individual's activity of daily living, which may necessitate proper intervention. This can only be achieved if the details of the pattern of peripheral nerve injuries are properly documented. While this information is available in some parts of the world, such information is lacking in Nigeria, especially in the northern part of the country where there has been an increase in the rate of insurgency, high incidence of motor vehicle accidents and post-election violence.

MATERIALS AND METHOD

A retrospective cross-sectional descriptive study design was used and the sample comprised the case folders of all patients in the health records department of five major hospitals in Kano State (Nigeria), namely: Aminu Kano Teaching Hospital (AKTH), Murtala Muhammad Specialist Hospital (MMSH), Muhammad Abdullahi Wase Specialist Hospital (MAWSH), National Orthopaedic Hospital, Dala (NOHD) and Hasiya Bayero Paediatric Hospital (HBPH). Only the folders of patients who presented at the hospitals from June 2010 to June 2014 were included. The years under consideration were the peak period of the Boko Haram insurgency in Northern Nigeria during which thousands of victims suffered a variety of injuries and Kano was a key referral centre for the management of such victims. Only

patients with PNI diagnosed and documented by the consulting physician were included, while patients with body segment weakness and no diagnosis were excluded.

Before the commencement of the study, ethical approval was applied for and obtained from the ethical committees of Aminu Kano Teaching Hospital (AKTH), National Orthopedic Hospital, Dala, Kano (NOHD), and Kano State Hospital Management Board HMB (which oversees Murtala Muhammad Specialist Hospital, Muhammad Abdullahi Wase Specialist Hospital and Hasiya Bayero Paediatric Hospital, Kano).

The respective heads of the Health Records Departments of the hospitals provided professional guidance to the researcher during the data collection. Demographic and other relevant information from each qualified (PNI diagnosed) folder were recorded including age, gender, causes, location nerve/plexus affected. The total number of folders sorted was 28,374 and the number of nerve injury cases was 454.

Other information that was obtained from the case folders include: mechanism of injury (such as road traffic accident, fall, cuts from a sharp object), levels and regions of peripheral nerve injuries and whether the patients were referred for physiotherapy or not. Descriptive statistics of frequency and percentage were computed for data interpretation, using Microsoft Excel 2010.

RESULT

During the study period, 28,374 patient's case folders were screened. A total of 454 patients (1.63%) were found to have peripheral nerve injuries (see table 1). Of these, 352 (77.5%) were male and 102 (22.5%) were female. Up to 55.5% of the nerve injuries were in patients within the age range of 21-40 years, followed by 0-20 years (19.2%). Patients >80 years had the least prevalence (0.6%). The most common mechanism of injury for PNI was motor vehicle accident (MVA), accounting for 42.1%, followed by sharp/penetrating objects (17.2%), while gunshot is the third leading cause (15.9%). Others and iatrogenic accounted for the least prevalence with 1.1% and 2.6% respectively. The prevalence, gender, age and cause distribution of the PNI are presented in table 1.

PNI cases were more common in the upper limb region (42.1%) followed by the lower limb (26%), while cases of multiple region affection was the least (9%). The most frequently injured nerves were the ulnar nerve (18%) and the median nerve (12.8%), both in the upper limb, followed by the sciatic nerve (10.8%) while the deep peroneal nerve was the least affected (1.7%). Of the 454 PNI cases, only 84 (18.5%) were referred for physiotherapy. The region

affections, nerves affected and referral for physiotherapy are presented in table 2.

Table 1. Prevalence and the age, gender and aetiology distribution of the peripheral nerves injuries (PNI)

Variable	Frequency	%
PNI		
Present	454	1.63
Absent	27,920	98.37
Total	28,374	100.00
Gender Distribution (Affected)		
Male	352	77.5
Female	102	22.5
Total	454	100.0
Age Range (Affected)		
0-20	87	19.2
21-40	252	55.5
41-60	79	17.4
61-80	33	7.3
>80	3	0.6
Total	454	100.0
Causes (Aetiology) of PNI		
MVA	191	42.1
Sharp/penetrating object	78	17.2
Fall (not due to MVA)	31	6.8
Burns	65	14.3
Gunshot	72	15.9
Iatrogenic	12	2.6
Others	5	1.1
Total	454	100.0

Key: PNI=Peripheral Nerves Injuries, MVA=Motor Vehicle Accident

Table 2. Site of injury, nerves affected and physiotherapy referral distributions for the PNI

Variable	Frequency	%
Site		
Upper limb	191	42.1
Lower limb	118	26.0
Head/Neck/Thorax	104	22.9
Multiple	41	9.0
Total	454	100.0
Nerves Affected		
Ulnar	80	18.0
Median	58	12.8
Radial	41	9.0
Musculocutaneous	16	3.5
Ulnar/median	43	9.5
Facial	34	7.5
Multiple (>2 Nerves)	13	2.8

Nerve affected (contd)	Frequency	%
Lat planter	11	2.4
Sciatic	48	10.8
Femoral	15	3.3
Tibial	22	4.8
Common Peroneal	42	9.3
Deep Peroneal	8	1.7
Others	23	5.0
Referral for Physiotherapy		
Yes	84	18.5
No	370	81.5
Total	454	100.0

DISCUSSION

This study was conducted with the aim of determining the prevalence and pattern of peripheral nerve injuries in Kano metropolis. The prevalence of peripheral nerve injuries was found to be 1.63%. The reported prevalence varied depending on the country where the study was conducted, the number of hospitals, years and range as well as the social context prevailing in the region (Campbell, 2008). While some studies reported prevalences ranging from 1.2% (Marina et al, 2014) in Mexico to 1.3% (Saadat et al, 2011) in Iran, which are less than but close to the prevalence in Kano (Nigeria), the similarity of the prevalences among these countries may not be unrelated to the fact that all are developing countries and probably not all cases are reported to health care facilities. Other studies have reported higher incidences; Taylor et al (2008) reported a 1.64% incidence of PNI among trauma patients, which may still be considered close to the finding of this study.

This study showed that >70% of the patients were younger than 40 years and the peak frequency was in the 21-40 years age group. In most studies, the average age is located within the fourth decade of life as shown by Noble et al (1999), 36.6 years; Eser et al (2009), 31.8 years; Marina et al (2014), 45.5 years; Saadat et al (2011), <50 years; and Filiz et al (2009), <50 years. This may be attributed to the fact that this age group is the most active in the society.

This study also showed that PNI is more prevalent among males (77.5%), with a male to female ratio of 3:1. This is in agreement with the findings of Eser et al (2009), 79%; Filiz et al (2009), 71%; and Noble et al (1999), (83%). Males seem to be more active in the society and engage more in risky occupations and cultural issues that may predispose them to such injuries. In Nigeria, driving is predominantly by males, so also are occupations that have to

do with handling sharp objects which have been identified as one of the leading causes of PNI.

In this study, the most common injury mechanism was motor vehicle accidents, (26.5%), followed by sharp penetrating objects (17.2%), then gunshots (15.9%). Commercial motor cycling, insurgency, clashes between thugs and occupations like aluminium and glass works may be contributory causes of PNI in Nigeria. Similar findings were seen in the literature with MVA as the leading cause of PNI as reported by Ciaramitaro et al (2010), 21%; Eser et al (2009), 26.9%; and Marina et al (2014), with 21% for MVA and 11% for gunshots.

In this study, it was observed that the upper limb was affected more (42.1%) than the lower limb in PNI. This finding is similar to that of many other studies: Eser et al (1999), 77%; Ahrari et al (2006), 52%; Ciaramitaro et al (2010), 80%; Saadat et al (2011), 83.9%. In some other studies, lower limb PNI was commoner than the upper limb as reported by Heidari et al (2010), 91%, but the high incidence of lower limb injuries was reported among earthquake victims, which may be attributed to the position of the victims when the earthquake occurred or incorrect evacuation and transportation of victims (Heidari et al, 2010).

According to some studies, the most frequently injured nerve in the upper limb was the radial nerve as reported by Creagh et al (1991), 19% and Heidari et al (2010), 24%. However, this study found that the ulnar (18.0%), median (12.8%) and sciatic (10.8%) were the most frequently injured nerves. Eser et al (2009) and Marina et al (2014) also identified the ulnar (27% and 18% respectively) and the median (21% and 10% respectively) as the most commonly injured peripheral nerves.

This study found that referral of PNI patients for physiotherapy is low in hospitals in Kano metropolis as only 84 (18.5%) of 454 cases were referred though physiotherapy has been regarded as an integral part of PNI management and rehabilitation (Landers and Altenburger, 2003). The low referral rate may be associated with many factors, which may include lack of adequate information on the injury severity in the patients' medical records, and the expertise of the consulting physician. In most hospital settings, the first contact physicians are general practitioners and they are likely to refer less when compared to trauma, neurology or orthopaedic specialists.

CONCLUSION AND RECOMMENDATION

The hospital-based prevalence of peripheral nerves injuries in Kano metropolis is low. Motor vehicle accidents seem to

have the highest associated PNI and post-PNI referral for physiotherapy was found to be low. There is need for proper team approach in the management of PNI patients.

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