

Prevalence and pattern of post-stroke cognitive impairment in Kano, Nigeria

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Abstract

Introduction: Stroke is one of the leading causes of morbidity and mortality and the second most common cause of cognitive impairment.

Objectives: Therefore, this study is aimed at determining the prevalence and pattern of Post-Stroke Cognitive Impairment (PSCI) in Kano, Nigeria.

Methods: A total number of 102 stroke survivors were contacted for the study but only seventy (70) of them participated and completed the study. Fifteen (15) patients declined to consent and 17 were excluded due to severe depression evaluated using the Beck Depression Inventory (BDI). The participants were assessed for levels of cognitive function and motor recovery using the MMSE and BRS scales, respectively

Results: The results of this study showed that the overall prevalence of PSCI was 67.14% with mild PSCI accounting for 32.86% of cases, while moderate and severe for 27.14% and 7.14% , respectively. Most participants (71.43%) were at the chronic stage of stroke, while in terms of motor recovery, the majority of strokes survivors were at the Brunnstrom Recovery Stage (BRS) 3 (30%) and only 10% were at the final stage of recovery (BRS 6)

Conclusion: Post-stroke cognitive impairment is high in Kano, especially among older stroke survivors with a low level of education and socio-economic status. It is very important to assess PSCI in the clinics to prevent subsequent complications. Future studies should evaluate other stroke outcomes, such as Activities of Daily Living (ADL), community participation and Quality of Life (QoL) as they are related to cognitive function.

Keywords: stroke, cognitive function, post-stroke cognitive impairment, motor recovery

Introduction

Stroke is the second most common cause of cognitive impairment [1]. Post-Stroke Cognitive Impairment (PSCI) is among the leading causes of disability and dependency among stroke survivors [2,3]. The PSCI occurs individually or in combination with other neurological deficits [4]. It is observed in about 20-80% of stroke cases depending on the geographic location and race [5]. Other factors affecting the occurrence of PSCI include advanced age, size and location of brain

lesion, level of education and socio-economic status [6].

A considerable proportion of patients with PSCI has been reported to be dependent in carrying out most of their Activities of Daily Living (ADL) [7]. The level of dependence in ADL is associated with the severity of cognitive impairment alongside other neurological deficits [3]. Motor deficits in the form of balance and gait impairments are highly correlated with the level of post-stroke cognitive impairment [8]. Furthermore, the ability to

initiate, execute, sustain, terminate or switch tasks is dependent on the level of post-stroke cognitive function [9]. Stroke survivors with cognitive impairment have difficulties recalling tasks and making judgment [6]. These difficulties lead to restriction in community [10] and rehabilitation participation [11].

Despite the effects of PSCI on stroke survivors, assessment and screening of cognitive function receives least attention during stroke rehabilitation [12]. Post-stroke cognitive function deserves equal attention as that of motor and sensory functions during rehabilitation [13]. Stroke rehabilitation involves activities that require good memory function for the patients to be able to learn and remember [14]. When it becomes hard for stroke survivors to concentrate and remember the tasks learned, rehabilitation becomes difficult [11]. Hence, screening and assessment of PSCI in the clinics becomes necessary. Studies conducted on the prevalence of PSCI in Nigeria are very limited, especially in Northern region. Therefore, this study is aimed at determining the prevalence and pattern of post-stroke cognitive function in Kano, Nigeria.

Material and Methods

A cross-sectional design was deployed for this study. The participants were recruited into the study using purposive sampling from Aminu Kano Teaching Hospital (AKTH) and Murtala Mohammed Specialist Hospital (MMSH). Ethical approval was sought and obtained from the ethics committee of AKTH and the Ministry of Health Kano state, Nigeria. The stroke survivors that agreed to participate were given the informed consent form to sign.

A total number of 102 stroke survivors were contacted for the study but only seventy (70) of them participated and completed the study. Fifteen (15) patients declined to consent and 17 were

excluded due to severe depression diagnosed using Beck Depression Inventory (BDI). The participants were assessed for the levels of cognitive function and motor recovery using the Mini-Mental State Examination (MMSE) and Brunnstrom Recovery Stage (BRS) scales, respectively.

Instruments

The Mini-Mental State Examination (MMSE): MMSE is a valid and reliable instrument for assessment of cognitive impairment in clinical settings [15]. The tool consists of two sections that, together, contain 11 tasks of cognition with a possible overall score ranging from 0 to 30. A score of 24 and higher purports to identify cognitively intact individuals. The scores of 23 and lower are indicative of cognitive impairment [16].

The Brunnstrom Recovery Stages (BRS): The BRS was designed to describe a sequence of extremity motor recovery after stroke [17]. It assesses motor activity of limbs based on the synergy pattern of movement that develops during recovery from a flaccid limb to near-normal and normal movement and coordination. The BRS is scored on a 6-level Likert-type scale (level I to VI). Higher levels represent better motor function [18].

Data analysis

The data obtained was summarized using descriptive statistics of frequency, percentage, mean and standard deviation and analyzed using Statistical Package for Social Science (SPSS) version 20.

Results

The results of this study showed that the mean age of the participants was below 60 years. A significant number of participants (64.29%) were females, (78.6%) married and (64.3%) never attending Western educational schools (Tab. 1.). The overall prevalence of PSCI in this study was

Table 1: Socio-demographic characteristics of the participants

Variables	n(%)	M±SD
AGE (YEARS)		
18-45	14(20.0)	59.11±16.43
46-72	44(62.9)	
73-100	12(17.1)	
GENDER		
Male	25(35.71)	45(64.29)
Female	45(64.29)	
MARITAL STATUS		
Single	3(4.29)	12(17.1)
Married	55(78.6)	
Divorced/Widowed	12(17.1)	
EDUCATION		
Never attended	45(64.3)	6(8.5)
Primary	12(17.1)	
Secondary	7(10)	
Tertiary	6(8.5)	
SES		
Lower class	8(11.4)	50(71.4)
Upper lower class	50(71.4)	
Lower middle class	6(8.6)	
Upper middle class	6(8.6)	

Key n = frequency, % = percentage, M= mean, SD=standard deviation, SES= socio-economic status

67.14% with mild PSCI accounting for 32.86% of cases, while moderate and severe accounting for 27.14% and 7.14%, respectively. Most participants (71.43%) were at the chronic stage of stroke, while in terms of motor recovery, the majority of strokes survivors were at the Brunnstrom Recovery Stage (BRS) 3 (30%) and only 10% were at the final stage of recovery (BRS 6), as shown in table 2.

Discussion

This study aimed at determining the prevalence and pattern of PSCI in Kano. The study findings demonstrated a high occurrence of PSCI in Kano, with overall prevalence of 67.14%, which similar to the findings of previous studies with high prevalence (more than half of cases) up to 72.8% [19] and 63% [20], respectively. Our study revealed that mild PSCI accounts for 32.86%, while moderate and severe constitutes 27.14% and 7.14%, respectively, which showed that mild and

Table 2: Clinical characteristics of the participants

Variables	n(%)	M±SD
MMSE		
Normal	23(32.86)	5(7.14)
Mild	23(32.86)	
Moderate	19(27.14)	
Severe	5(7.14)	
BRS		
Stage 1	118 (25.71)	14.5±2.21 Mo
Stage 2	13 (18.57)	
Stage 3	21 (30.00)	
Stage 4	6 (8.57)	
Stage 5	5 (7.14)	
Stage 6	7 (10.00)	
DURATION		
Acute	2(2.86)	14.5±2.21 Mo
Sub-acute	18(25.71)	
Chronic	50(71.43)	
SIDE OF AFFECTATION		
Left	36(51.43)	34(48.57)
Right	34(48.57)	

Key: n = frequency, % = percentage, MMSE = Mini mental state examination, BRS = Brunnstrom recovery stage, M= mean, SD = standard deviation, Mo= months

moderate PSCI account for 60% of all the cases in this study. This contradicts the finding of another study where 27% and 16% had mild and moderate cognitive impairment, respectively, accounting for 43% of participants with PSCI [20]. Furthermore, a study on Nigerian population reported 39.9% of cases with mild to moderate PSCI [21].

The variations in reporting PSCI depend on the instruments, race, socio-economic status, type of stroke, duration of stroke, area of brain affected and geographical location. The result of this study conducted in Northern Nigerian varies from the result of another study conducted in the western part of Nigeria due to geographical differences accounting for dissimilarities in the level of western education. The high prevalence of PSCI obtained in this study may be associated with the fact that the data was drawn from higher representations of participants (64.3%) without western education. This is supported by the study reporting that

low level of education is associated with higher prevalence of PSCI [2].

In our study, most of participants were at the chronic stage of stroke (71.43%), which may be another reason for high occurrence of PSCI observed in the study. This is in line with the study showing that prevalence of cognitive impairment after stroke remains persistently high over time [22]. According to this study, a significant number of participants (82.8%) were in the lower class in terms of socio-economic status. This is consistent with the study demonstrating a higher percentage of participants (80%), who earn less than 50,000 Naira (approximately 200 USD) per month [21]. The findings of another study further support that socio-economic status affects cognitive function among individuals after stroke [2]

In terms of motor recovery, the majority of stroke survivors were at the Brunnstrom recovery stage 3 (30%) while only 10% were at the final stage of recovery. Likewise, several studies have shown that good cognitive function translates to better motor activities in the limb and subsequently better activity participations [2,8]. The majority of our participants (62.9%) were within the age range of the 46-72 years with a mean age of 60 years. This is in line with a study finding showing that age of stroke survivors is a determinative factor for developing PSCI [20].

Conclusion

Post-stroke cognitive impairment is high in Kano, especially among older stroke survivors with low levels of education and socio-economic status.

Limitations

The study has some limitations, which include a small sample size and the inability to assess domains of cognition such as memory, attention and executive function.

Recommendations

It is essential to assess PSCI in the clinics to prevent subsequent complications. Future studies should assess other stroke outcomes, such as Activities of Daily Living (ADL), community participation and Quality of Life (QoL) as they relate to cognitive function.

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