Musculoskeletal Pain after Stroke: Prevalence, patterns and distribution among survivors in Maiduguri, North Eastern Nigeria

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ABSTRACT

Background: Musculoskeletal pain is one of the factors that limit movements at a joint and impede functional use of the limb as well as rehabilitation activities after stroke. **Objective:** This study determined the prevalence, pattern and distribution of musculoskeletal pain among stroke survivors receiving physiotherapy care in Maiduguri. **Methods:** A cross-sectional study design was used to recruit 94 stroke survivors from the physiotherapy clinics of two randomly selected tertiary hospitals in Maiduguri. In addition to sociodemographic and clinical characteristic information, musculoskeletal pain was assessed with the Box-Numerical Rating Scale. Prevalence, pattern and distribution of musculoskeletal pain were computed with frequency and percentages. Chi-square test was employed to compare the difference in the prevalence of musculoskeletal pain among participants with various socio-demographic and clinical characteristics. **Results:** The mean age, post-stroke duration and duration of physiotherapy intervention of the participants were 54.2±12.5 years, 18.27±23.98 months and 13.04±15.09 months, respectively. Majority of the participants experienced musculoskeletal pain within the first 3 months after stroke. The most commonly affected body region was the shoulder (80.7%) followed by the wrists/hand (60.2%) and the least affected body region was the elbow (38.5%). The overall prevalence of musculoskeletal pain was 88%. The prevalence was significantly (χ^2 =4.5, p-value=0.034) higher among males (57.8%) than females (42.2%). **Conclusion:** The study found high prevalence of musculoskeletal pain among stroke patients with males more commonly affected than females, and the shoulder being the most commonly affected joint. Assessing musculoskeletal pain and effective interventions for improving pain should constitute an integral part of a stroke rehabilitation plan.

Keywords: Prevalence, Stroke, Musculoskeletal pain, Stroke survivors

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Introduction

Stroke is an important cause of death and disability in Africa, with some Sub-Saharan African countries recording mortality and case fatality exceeding those in the developed

world.[1] The current prevalence of stroke in Nigeria is 1.14 per 1000 while the 30-day case fatality rate is as high as 40%.[2] Stroke is often the leading cause of improper mechanics of limb motion and gait performance, which are associated with pain, decreased muscle strength and poor motor control, along with spasticity. Stroke patients suffer from pain such as hemiplegic shoulder pain, general musculoskeletal pain, and central post stroke pain.[3] These complications of stroke often lead to functional limitations and impede rehabilitation.[4]

Musculoskeletal pain (MSP) is one of the major complications of stroke that often aggravates functional limitation and impedes rehabilitation.[3,5] This could be as a result of exacerbation of pre-existing and/or coexisting painful conditions or a direct consequence of the stroke.[5] However, irrespective of its origin, MSP would impact the outcomes of stroke intervention particularly because pain causes considerable distress and reduced functional activity that may invariably hinder rehabilitation.[6] An example of MSP is shoulder pain that has been associated with poorer outcomes and prolonged hospital stays.[7]

Considering the negative impact of post stroke MSP on rehabilitation and quality of life of stroke survivors there is urgent need for information on its prevalence and distribution among stroke survivors in Nigeria. To our knowledge, only a single study has explored the prevalence of MSP among stroke survivors in Nigeria,[5] while there appears to be a dearth of information on the subject matter in Northern Nigeria. This study was therefore designed to investigate the prevalence, pattern and distribution of MSP among stroke survivors attending Physiotherapy at two selected clinicsin Maiduguri city, North-eastern Nigeria.

Materials and Methods

In this cross-sectional study, 94 stroke survivors were recruited, using nonprobability sample of convenience, from two randomly selected government hospitals in Maiduguri (University of Maiduguri teaching Hospital and State Specialist Hospital). This sample size was based on previous studies that have used similar sample sizes of 83 to 102.[5,16] Eligibility criteria included having stroke of at least 1 week duration, being free from any psychological disorder and willingness to participate by provision of written informed consent.In addition to sociodemographic and clinical characteristic information, musculoskeletal pain was assessed with the Box-Numerical Rating Scale at the following body regions; shoulder, elbow, wrist/hand, hip, knee, ankle/feet joints. The overall prevalence was defined as ever had musculoskeletal pain in any part of the body region in the past 2 weeks. The Box-Numerical Rating Scale is described as an excellent choice for pain assessment in heterogeneous patient groups.[8] It is an 11-point numeric scale that ranges from 0 to 10 with 0 representing no pain and 10 representing pain at its worst.[10] It scores musculoskeletal pain based on yes or no pain, and pain intensity score of 1-3 indicate mild pain, 4-6 indicate moderate pain and 7-10 indicate worst/severe pain.[9]

The approval of Research and Ethical Committee of the University of Maiduguri Teaching Hospital (UMTH) was sought before the study commenced. The permission of the Heads of Department of Physiotherapy/clinics at the selected hospitals was also sought. The questionnaire was administered while the patients were not engaged in treatment activities and completed in the clinic. Each of the questionnaires administered were

accompanied by a cover letter containing informed consent form. Participation in the study was followed by an explanation of the purpose of the study by the researcher. The questionnaires were either filled and returned on the same day or filled and returned on the next hospital visit (appointment). It takes about 7 to 10 minutes to fill in the questionnaire.

Descriptive statistics (mean ± standard deviation) were used to compute numerical variables (i.e. age, post-stroke duration and duration of Physiotherapy intervention), while, frequency and percentages were used to compute the categorical variables (i.e. gender, marital status and occupational status). Also, the prevalence of musculoskeletal pain musculoskeletal pain as well as the distribution by the body region of participants was computed using frequency and percentages. Chi-square was employed to probe the difference in the prevalence of musculoskeletal pain among participants of various socio-demographic and clinical characteristics. The level of statistical significance was set at $P<0.05$. All data entry, cleaning and analyses were done in Statistical Package for Social Sciences (SPSS) version 20.0 (IBM, Inc.).

Results

A total of 94 stroke patients participated in this study, comprising of 58(62%) males and 36(38%) females. The age of the participants ranged from 30-86 years, with mean of 54.2±12.5 years. Majority of the participants were married 83(88%), unemployed 60(64%) with no formal education 51(54%). Stroke patients with left-sided affectation were in majority 53(56%). Their post stroke duration ranged from 0.5-84 months with mean of 18.27±23.98 months. Participants' duration of physiotherapy intervention ranged from 0.25-72 months with mean of 13.04±15.09 months. Table 1 shows distribution of participants' socio-demographic and clinical characteristics.

Table 1: Socio-demographic and clinical characteristics of the participants (n=94)

Variables	Mean±SD	Frequency n	%
Age (years)	54.40±12.50		
Post Stroke Duration (months)	18.27±23.98		
Duration of Physio intervention (months)	13.04±15.09		
Gender			
Male		58	61.7
Female		36	38.3
Marital Status			
Married		83	88.3
Divorced		4	4.3
Widowed		7	7.4
Occupational Status			
Employed		25	26.6
Unemployed		60	63.8
Retired		9	9.6

Physio= Physiotherapy

In Table 2, the distribution of MSP by region of the body shows that 34 (50.7%) participants had right shoulder pain and more than half of the participants (59.4%) reported left elbow pain. Also, 52.9% and 47.6% reported having left knee and ankle/feet pain respectively. Meanwhile, 50 (60.2%) stroke survivors were said to have wrist/hand pain and only 35 (42.1%) had hip pain. The overall prevalence of MSP as reported by the participants was 88.3%. Similarly, 25, 41 and 17 participants reported onset of pain after stroke as <1 month,1-3 months and>3 months respectively (not shown in table).

Table 2: Musculoskeletal pain by body region affected (n=83)

Variable			Overall Pain	
	N	**%**	**n**	**%**
Shoulder				
Right	34	50.7	67	80.7
Left	33	49.2		
Elbow				
Right	13	40.6	32	38.5
Left	19	59.4		
Wrist/Hand				
Right	23	46.0	50	60.2
Left	27	54.0		
Hip				
Right	16	45.7	35	42.1
Left	19	54.3		
Knee				
Right	16	47.1	34	40.9
Left	18	52.9		
Ankle/Feet				
Right	22	52.4	42	50.6
Left	20	47.6		

The difference in MSP prevalence by sociodemographic variables is depicted in Table 3. Although not statistically significant, participants with age between 36-55 years (48.2%) reported highest MSP closely followed by those with age range 56-75 years (39.8%). There is no significant difference in MSP in all other sociodemographic variables, except gender where male (57.8%) respondents reported higher prevalence of MSP than their female (42.2%) counterparts (p=0.034).

Table 3: Difference in the Prevalence of MSP among Participants (n=83)

Variable	MSP		χ^2	P-value
	n	**%**		
Age			1.85	0.604
30-35	7	8.4		
36-55	40	48.2		
56-75	33	39.8		
>75	3	3.6		
Gender			4.50	0.034*
Male	48	57.8		
Female	35	42.2		
Occupational Status			4.91	0.086
Employed	25	30.1		
Unemployed	51	61.4		
Retired	7	8.4		
Marital Status			1.65	0.438
Married	72	86.7		
Divorced	4	4.8		
Widowed	7	8.4		
Educational Status			3.75	0.440
Primary	4	4.8		
Secondary	8	9.6		
Tertiary	22	26.5		
Postgraduate	3	3.6		
None	46	55.4		
Duration of Physiotherapy Intervention			7.40	0.060
<1 Month	12	14.5		
1-6 Months	35	42.2		
7-12 Months	15	18.1		
>12 Months	21	25.3		
Side of Affectation			1.35	0.245
Right	38	45.8		
Left	45	54.2		

χ^2= chi-square; MSP=musculoskeletal pain; *=significant at p<0.05

Discussion

The aim of this study was to investigate the prevalence and sociodemographic and clinical patterns of musculoskeletal pain among stroke survivors in Maiduguri. The 54.20±12.50 years mean age of participants found in this study is in keeping with the findings of various studies across the globe both in the developed and developing nations.[5,11,12] This is an indication that stroke still remains common in this age bracket hence, warrants continued engagement in creating awareness and ensuring people at this age monitors and remain alert to the red flags of stroke occurrence. In consonance with previous studies,[5,14] this study found that males were more than their female

counterparts. Further, this proves the fact that male gender is more susceptible to stroke attack compared to the female gender.[13] In their study, Mudzi et al.[15] discovered majority of the participants were unemployed which is in accordance with the findings of this study. Also consistent with previous report,[16] the preponderance of participants in the present study were married and with left sided affectation. In comparison to previous study,[5] the present study additionally ascertains that majority of the participants have onset of their MSP within the first three months after stroke.

The overall pain prevalence was found to be 88.3% comparable to the 79.4% prevalence result obtained in South-western Nigeria.[5] The most reported site of musculoskeletal pain was the upper limb (shoulder and wrist/hand). This observation corresponds to findings from earlier study[17] where it has been shown consistently that shoulder pain is a common complication after stroke. Comparing difference in the prevalence of musculoskeletal pain by age of the participants, the result found no significant difference, which implies that irrespective of age, musculoskeletal pain could occur following stroke. However, the findings showed disparity with the one reported by Chamila et al.,[18] that found stroke survivors aged ≥55 years had more pain. This difference from our finding may be associated with the nature of population being captured in their study and non-exclusion of participants with past history of musculoskeletal pain such as degenerative joint disorders.

However, earlier study reported that irrespective of age, post stroke musculoskeletal pain could occur as a result of slow anatomical, physiological and biochemical changes found to develop in patients months or years after stroke.

Chamila et al.,[18] reported post stroke MSP to be more common among males than females. The findings of this study alsobuttressed a significant difference in the prevalence of musculoskeletal pain between male and female stroke survivors with males reporting MSP more than the females. The result may also be linked with the findings that males are at higher risk of getting stroke,[13] hence, the higher number of male participants than their female counterparts in our study. The result indicates there was no significant difference in prevalence of musculoskeletal pain among stroke survivors with different marital status. The study, however, shown that married participants have higher musculoskeletal pain. This is somewhat consistent with Hossain et al.,[11] who reported that 96% of participants with stoke to be married. Although there is no study for comparison, marital status may not be a factor in prevalence of musculoskeletal pain among stroke survivors.

In this study, comparison of the prevalence of MSP among participants with different educational status has shown that there is no significant difference although, the study shows that majority of the participants had no formal education. This finding may be because of the low level of formal education observed among participants. This may not have granted them the opportunity to learn about stroke nor its musculoskeletal complications. As such, they may not know how to prevent or manage the pain. Similarly, no significant difference in the prevalence of MSP among stroke survivors with different side of affectation was recorded in the present study. This result is in agreement with that obtained in a similar study by Hossain et al.[11] The study found that irrespective of the side of affectation, majority of stroke survivors would still experience joint pain. Also, more

recently, another study among stroke survivors found no significant difference in musculoskeletal pain and side of affectation.[19] Presence of MSP was also compared among participants with varying duration of physiotherapy intervention with no significant difference detected. This result may be attributed to the fact that majority of the participants were not referred for physiotherapy at early stage of stroke. This will result to musculoskeletal complications primarily affecting the joints integrity leading to consequent joint pain. Another reason could be that there is no access to physiotherapy at stroke onset, such as in the case of those living in rural or remote areas. This may be true as several studies have shown the effectiveness of early rehabilitation in prevention and improvement of post stroke joint pain.[14,20] Also, although participants have sought for rehabilitation intervention, they may not have complained of joint pain or even if they complained the focus may not have been on the prevention and management of hemiplegic joint pain.

This study has some limitations that should be considered when interpreting the findings. First, non-probability sampling technique was used, so the participants may not be true representations of stroke survivors in Maiduguri.

Second, the cross-sectional design adopted precludes a cause and effect interpretation to the gender pattern of MSP found in the study. Third, the modest sample size and lack of information on power calculation may limit the generalization of the results. Also, the absence of psychometric evidence for the Box-Numerical Rating Scale among stroke survivors in Maiduguri constitutes a limitation to the study.

However, the Box-Numerical Rating Scale is a commonly used pain rating instrument for assessing pain in chronic conditions including stroke.

Conclusion

The outcome of this study suggests musculoskeletal pain is a common phenomenon in stroke patients with overall prevalence of 88%.

Prevalence of musculoskeletal pain has a gender pattern, being more common among males than females.

The finding of this study emphasizes further the need for assessing musculoskeletal pain and effective interventions for improving pain as an integral part of stroke rehabilitation plan at hospitals in Maiduguri.

Acknowledgements

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