

Chronic Pain After Stroke: A Hospital-Based Study of Its Profile and Correlation with Health-Related Quality of Life

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Received 2016 October 24; Revised 2016 December 01; Accepted 2016 December 04.

Abstract

Background: Chronic pain is one of the most troublesome sequelae of stroke. The correlation between post-stroke pain and patients' quality of life has not been extensively studied.

Objectives: The purpose of this study was to investigate certain profiles of post-stroke chronic pain and evaluate its correlation with health-related quality of life.

Methods: The study involved 118 participants with stroke comprising 72 (61.0%) males and 46 (39.0%) females. A convenience sampling technique was used to recruit the subjects for the study. Socio-demographic data of the participants were taken. Data on chronic pain and health-related quality of life (HRQoL) were collected using the brief pain inventory (BPI) and short form health survey (SF-36), respectively. Independent t-test was used to compare HRQoL between participants with and without chronic pain. The correlation of chronic pain with HRQoL was investigated using Spearman's correlation coefficient. The level of significance was $P \leq 0.05$.

Results: Chronic pain was reported by 88 (72%) out of the 118 participants. Musculoskeletal pain was the most common type of pain. The upper limb was the most reported site of pain (63.6%). Participants with chronic pain had poorer HRQoL than those without chronic pain ($P = 0.001$). There were significant correlations between chronic pain and all domains of HRQoL ($P < 0.05$) with r values ranging from 0.181 to 0.309.

Conclusions: The study showed that the majority of patients with stroke had chronic pain. The pain had a significant impact on all domains of health-related quality of life among the patients.

Keywords: Stroke, Chronic Pain, Health-Related Quality of Life, Correlation

1. Background

Chronic pain is one of the most disturbing sequelae of stroke occurring in majority of the patients. According to reports from some studies, the prevalence of chronic pain in stroke survivors ranges from 11% - 55% (1-5). Pain may occur even when the stroke is of mild or moderate severity, and may not begin until several months later (6). Patients with stroke who develop chronic pain are more likely to have physical and cognitive decline, making it an important complication of stroke (7). Presence of post-stroke pain and its effect on normal living is of considerable concern in stroke recovery and demands strict attention (8, 9). It has been asserted that complications related to pain and cognition, as well as affective symptoms that are potentially preventable, may previously have been underestimated in stroke survivors because the pain may be undiagnosed and, therefore untreated (9, 10).

Chronic pain after stroke could be central post-stroke

pain, musculoskeletal pain, affected shoulder pain, or bodily pain or it can be a combination of two or more types of these pains. Damage to central nervous system after stroke could result in the central post-stroke pain (CPSP) and it is localized to the territory of neurological deficit, which corresponds to the cerebrovascular lesion. It has been indicated that the prevalence of CPSP is unknown partly because it is difficult to be distinguished from other types of post-stroke pain (11). Musculoskeletal pain may result directly from the stroke or from exacerbation of pre-existing or co-existing conditions. It can lead to considerable distress, prolonged hospital stay, and reduced functional ability that invariably hinder rehabilitation (9, 12). Hemiplegic shoulder pain is the most frequent pain condition in stroke. Patients may have many types of pain at the same time (13, 14) and may have had chronic pain prior to stroke (15).

Health-related quality of life (HRQoL) is not frequently

measured although it can be used to assess the impact of disease from the perspective of the patient. Measurement of HRQoL after stroke would provide information on holistic picture of stroke recovery, especially because of the wide spectrum, symptoms, and impairments associated with stroke (15). It has been stated that post-stroke pain is significantly associated with decreased satisfaction with quality of life, particularly in men (16,17). Incidence of post-stroke pain may pose adverse effects on patient's health-related quality of life and affect intervention plans aimed at restoring function after stroke. It is therefore important to study the type, site, and characteristics of post-stroke chronic pain syndrome and assess its relationship with patients' quality of life.

2. Objectives

The aim of the present study was to investigate certain profiles of chronic pain after stroke and evaluate its correlation with different domains of health-related quality of life.

3. Methods

This study was a cross-sectional analytical survey. A total of 118 stroke survivors participated in the study. They were recruited from a cohort of stroke survivors undergoing rehabilitation at two tertiary hospitals and two general hospitals in Lagos, Lagos State, Nigeria. Participants were those who had survived stroke attack for duration of not less than 6 months and without a history of chronic pain before the incidence of stroke. Participants were selected using convenience sampling technique. Patients were excluded from the study if they had recurrent stroke, significant cognitive, visual and language impairments, or any history of fracture. Ethical approval was obtained from health research and ethics committees of the involved institutions. Informed consent had been also obtained from the participants before they were enrolled into the study.

Short form of brief pain inventory (bpi) and medical outcome study 36-item short-form health survey (SF-36) were the research instruments used in the study (14).

The severity of pain and its impact on the patient's daily functioning were assessed with the brief pain inventory (bpi) short form. The patient was asked to rate their worst, least, average, and current pain intensity, list current treatments and their perceived effectiveness, rate the extent to which pain interferes with their general activity, mood, walking ability, normal work, and relations with other persons. This instrument responds to changes in pain associated with pharmacological, physical, and psychological interventions (18). The BPI has been validated in

many patient populations and its acceptable reliability has also been reported in many studies (18).

The short form-36 health survey is a scale used to assess the quality of life changes of the participants. It was introduced in 1996 to correct deficiencies identified in the original version. The total possible score ranges from 0 to 100 with higher scores indicating a better health state. The eight sections are vitality, physical functioning, bodily pain, general health perceptions, physical role functioning, emotional role functioning, social role functioning, and mental health (19). It is used to evaluate a patient's health status, monitor and compare disease burden, and determine the cost effectiveness of treatment (20). The SF-36 has been well validated, and many studies that examined its reliability have reported values above 0.80 (20).

3.1. Data Analysis

Data were analyzed using statistical package for social sciences (SPSS) version 21. Physical and demographic characteristics were summarized using descriptive statistics of mean, standard deviation, and percentages. Results were presented in tables. Independent t-test was used to determine the significance of the difference in health-related quality of life between participants with and without chronic pain. Spearman's correlation coefficient was used to determine the correlation between chronic pain and HRQoL. The level of significance for inferential statistics was $P \leq 0.05$.

4. Results

A total of 118 patients took part in the study. They comprised 72 males (61.0%) and 46 females (39.0%). Thirty-five (29.7%) participants were within the age range of 60 - 69 years while 5 (4.2%) were less than 30 years of age. Sixty-five (55.1%) participants had right hemispheric stroke with left hemiplegia while 53 (44.9%) had left hemispheric stroke with right hemiplegia. Duration of stroke was 6 - 9 months in 48 (40.7%) of the participants while 41 (34.7%) had had stroke for more than 24 months (Table 1).

The pain profile of the participants is shown in Table 2. At six months post-stroke, 85 (72%) of the participants reported experiencing pain while 33 (28%) reported not experiencing pain. The most common (75, 63.6%) type of chronic pain in the participants was musculoskeletal pain (including affected shoulder joint) while the least frequent (10, 8.5%) type of pain was central post-stroke pain. Seventy-one (60.2%) of the participants had pain at the upper limb region (shoulder, elbow, and wrist), while 3 (2.5%) had pain at the head and neck region (Table 2).

The severity of chronic pain and its effect on the participants according to the brief pain inventory (BPI) are

Table 1. Sociodemographic Profile of Participants

Variable	Frequency (n)	Percentage (%)
Gender		
Male	72	61
Female	46	39
Total	118	100
Age		
< 30	5	4.2
30 - 39	17	14.4
40 - 49	26	22.0
50 - 59	20	17.0
60 - 69	35	29.7
70 and above	15	12.7
Total	118	100
Duration of stroke		
< 6 months	0	0
6 - 9 months	48	40.7
10 - 12 months	8	6.8
13 - 24 months	21	17.8
> 24 months	41	34.7
Total	118	100.0
Change of work due to stroke		
Yes	57	48.3
No	48	40.7
No response	13	11.0
Total	118	100.0

shown in [Table 3](#). The pain reported by most participants (62, 52.6%) was not severe (VAS = 2.87). An average pain intensity of 2.35 ± 3.01 was reported by the participants to interfere with their life styles, and the worst pain in the last 24 hours gain the mean intensity of 3.46 ± 1.1 . The comparison of health-related QoL between the 85 participants with chronic pain and 33 participants without chronic pain is shown in [Table 4](#). The least mean difference (6.9) was recorded in the domain of role limitation to mental health while the highest (47) was in the domain of role limitation to physical functioning. However, there were significant differences between participants with chronic pain and those without chronic pain in all the domains of health-related QoL ($P = 0.001$). In participants with chronic pain, the correlation between chronic pain and quality of life is shown in [Table 5](#). Significant correlations were found between chronic pain and all the domains of health-related quality of life ($P < 0.05$).

5. Discussion

The main aim of this study was to investigate certain profiles of chronic pain after stroke and evaluate its correlation with different domains of health-related quality of life. The study revealed a high prevalence of chronic pain among stroke survivors. Majority of the patients presented with musculoskeletal pain. However, the pain felt by most participants was not severe. The most reported site of chronic pain was the upper limb (shoulder, elbow, and wrist). Health-related quality of life was found to be significantly lower in participants with chronic pain than participants without chronic pain. Chronic pain was significantly correlated with all domains of HRQoL. One limitation of this study is the small sample size, when compared to the number of participants in similar studies. Also, the main instruments used in the study have not been cross-culturally adapted for use in Nigeria and this might

Table 2. Participants' Pain Profile

Variable	Frequency (n)	Percentage (%)
Experience of pain		
Yes	104	88.1
No	14	11.9
No response	-	-
Total	118	100
Type of pain		
Central post stroke pain	10	8.5
Musculoskeletal pain	75	63.6
No response	33	27.9
Total	118	100
Site of pain		
Head and neck	3	2.5
Upper limb (Shoulder)	71	60.2
Thorax	1	0.8
Lower limb	23	19.5
No response	20	16.9
Total	118	100

Table 3. Severity of Chronic Pain and Its Effect on Participants (n) = 118^a

Variables	Mean \pm SD
Worst pain intensity in the past 24 hours	3.46 \pm 1.1
Least pain intensity in the past 24 hours	2.85 \pm 1.5
Pain intensity on the average	2.87 \pm 1.5
Pain intensity right now	2.88 \pm 1.5
Intensity of pain interfering with general activity	3.01 \pm 1.4
Intensity of pain interfering with mood	2.70 \pm 1.6
Intensity of pain interfering with walking ability	2.98 \pm 1.5
Intensity of pain interfering with normal work	3.12 \pm 1.3
Intensity of pain interfering with sleep	2.35 \pm 1.7
Intensity of pain interfering with enjoyment of life	2.51 \pm 1.7
Average pain intensity interfering with lifestyle	2.35 \pm 3.01

^aNB: VAS was used to assess pain intensity.

have some adverse effects on the results.

Chronic pain syndromes have been reported to be a common complication of ischaemic stroke (21). Prevalence of chronic pain reported in previous studies varies widely from 11 to 55% (11). The high prevalence of chronic pain (72%) reported in this study is similar to that reported in another study (22). Findings from other relevant studies (7,

14, 15, 22, 23) showed lower prevalence rates. This difference may be explained on the basis of different geographic locations where the studies were conducted. The present study was conducted on an African group of stroke survivors; and it would have been ideal to compare the results with those of similar studies from Africa. Such studies are, however, not available. Hemiplegic shoulder pain was the most common type of post-stroke pain observed in this study while the least frequent type was the central post-stroke pain. This observation is similar to what has been observed in previous studies (9, 14) where it has been shown consistently that shoulder pain is a common complication after stroke.

In participants with chronic pain, health-related quality of life was found to be significantly lower than in participants without chronic pain. Similar results have been reported in previous studies indicating this trend as a common feature after stroke (7, 14). Presence of chronic pain may reduce the participant's wellbeing as pain has been shown to reduce functional capacity of any individual (24). In the present study, this observation is confirmed by the result demonstrating that most participants with chronic pain had high role limitation in different domains of quality of life except in the domain of vitality. It was also observed in this study that there were significant correlations between chronic pain and all the eight domains of qual-

Table 4. Comparison of Health-Related QoL Between Participants with Chronic Pain and Participants Without Chronic Pain (n = 118)

Domains of Quality of Life Questionnaire (SF-36)	With Chronic Pain Mean \pm SD	Without Chronic Pain Mean \pm SD	Mean Difference	t Value	P Value
Role limitation to physical functioning	78 \pm 5.4	31 \pm 5.6	47.0	556.972	0.001 ^a
Role limitations to physical health	68.4 \pm 5.7	34.4 \pm 5.7	34.0	48.755	0.001 ^a
Bodily pain	64 \pm 5.4	23 \pm 5.7	41.0	239.466	0.001 ^a
Role limitation to general health	64 \pm 6.5	28.3 \pm 5.7	35.7	40.636	0.001 ^a
Role limitation to social functioning	59 \pm 5.7	21 \pm 5.6	38.0	207.544	0.001 ^a
Vitality	43.7 \pm 5.6	26 \pm 5.7	17.7	-66.281	0.001 ^a
Role limitations to emotional problems	58.7 \pm 5.6	28 \pm 5.7	30.7	357.061	0.001 ^a
Role limitation to mental health	56.3 \pm 5.7	49.4 \pm 5.7	6.9	407.306	0.001 ^a

Abbreviations: SD: Standard Deviation; t: Independent t-test.

^aSignificant at P < 0.05.

Table 5. Correlation Between Chronic Pain and Quality of Life of Participants With Chronic Pain (n = 85)

Variables	r Value	P Value
Quality of life domains		
Role limitation to physical functioning	0.281	0.004 ^a
Role limitations to physical health	0.309	0.002 ^a
Bodily pain	0.198	0.043 ^a
Role limitation to general health	0.229	0.018 ^a
Role limitation to social functioning	0.306	0.002 ^a
Vitality	0.181	0.048 ^a
Role limitations to emotional problems	0.196	0.036 ^a
Role limitation to mental health	0.274	0.003 ^a

Abbreviation: r = Spearman's correlation coefficient.

^aSignificant at P < 0.05.

ity of life in participants with chronic pain. Correlation between chronic pain and different domains of quality of life has also been reported in previous studies (14, 25). This demonstrated the fact that presence of chronic pain has an impact on quality of life of the stroke survivors.

In stroke survivors, the presence and intensity of pain have significant negative effects on health-related quality of life (25). Apart from pain, health-related quality of life may also be affected by fatigue and depression which are common symptoms among patients with stroke (26). Patients without chronic pain are presumed to be more comfortable and can enjoy life better compared to patients with chronic pain. It has also been shown that quality of life is very poor in patients that have a combination of different types of pain (27). In some studies (14, 28, 29), it has been reported that there is no significant relationship in health-related quality of life between stroke survivors

with chronic pain and those without chronic pain. This report is different from the results of the present study where a significant relationship was observed in health-related quality of life between stroke survivors with and without chronic pain. The difference may be explained by the fact that participants in those studies were preselected for having good rehabilitation potential. Although 72% of stroke survivors in this study reported chronic pain, most participants stated that the pain was not severe. However, the pain could interfere with their life styles confirmed by the significant impact of chronic pain on all domains of health-related quality of life in the patients.

5.1. Conclusion

The findings of this study showed that the majority of patients with stroke suffer from pain, which may significantly affect their health-related quality of life. Based on

the findings, it is suggested that rehabilitation programs for stroke survivors should include relief of chronic pain in order to improve their quality of life.

Acknowledgments

We appreciate all those who assisted us in this study, as well as all participants who consented to partake in the study.

Footnotes

Authors' Contribution: Conception and research design: Olajide Ayinla Olawale and Chidinma Joy Ezeugwa; acquisition and analysis of data: Chidinma Joy Ezeugwa and Titilope Oluwatobiloba Ajepe; drafting the manuscript: Kayode Israel Oke; critical revision of the manuscript for important intellectual content: Olajide Ayinla Olawale.

Financial Disclosure: None declared.

Funding/Support: None declared.

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