

Profile of Stroke Survivors Managed at the Physiotherapy Department of a Tertiary Teaching Hospital in Southeast Nigeria

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ABSTRACT

Background: Stroke has been reported as a major cause of death and neurological disability in adults and imposes a heavy emotional and financial burden on the family of the patient and society. Several risk factors have been associated with the occurrence of stroke. **Objectives:** This research was aimed at evaluating the profile of stroke survivors rehabilitated at the physiotherapy department of a tertiary teaching hospital in Nigeria. **Materials and Methods:** A total of 100 case files of stroke survivors from 2016 to 2020 were randomly selected from the medical record of Nnamdi Azikiwe University Teaching Hospital. The socio-demographic data and the comorbid risk factors associated with stroke were retrieved, documented in a proforma, and analyzed. **Results:** Ischemic stroke (81%) and left hemispheric stroke were more prevalent than right hemispheric and brainstem strokes. The research identified the highest percentage of stroke cases to be diagnosed in 2020. Female clients between the ages of 51-60 years, married and had less than five (5) children represented a greater percentage of stroke survivors. Hypertension (80%), diabetes mellitus (39%), and high blood cholesterol (14%) were associated with ischemic stroke. The most recorded occupation group was traders (37%), followed by civil servants (11%). **Conclusion:** The outcome of the study shows that hypertension, diabetes mellitus, and high blood cholesterol were the most prevalent comorbid risk factors in the sample size studied. There was an association between the number of children and the pattern of stroke.

Keywords: Stroke, Stroke survivors, Risk factors, Physiotherapy Outpatient, Tertiary Hospital.

INTRODUCTION

Stroke is defined as a syndrome of rapidly developing clinical signs of focal or global loss of cerebral functions with symptoms lasting 24 hours or longer or resulting in death with no apparent cause other than of vascular origin [1]. Stroke has been reported as a major cause of death and neurological disability in adults and imposes a heavy emotional and financial burden on the family of the patient and society [2]. It remains the third leading cause of death and the leading cause of serious long-term disability [3]. In addition to the physical impairments caused by a stroke, the emotional, social, and economic impacts of the stroke can be overwhelming for stroke survivors and their families [3]. Though there is a

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limited national statistic on stroke, there are however reports indicating that stroke had become the leading cause of neurological admission in most tertiary hospitals in Nigeria, taking over from central nervous system infections reported in earlier studies [4]. Stroke may be due to infarction (Ischemic stroke) in 80% of cases or haemorrhage in the remaining 20%. Ischemic stroke presents clinically as a focal neurological deficit of sudden onset presenting with headache, weakness of a part of the body, and loss of speech as common symptoms unless the brain stem is involved [5]. Hemorrhagic stroke manifests in diverse ways depending on the site, size of the bleed. Headache, vomiting, global neurological deficit, and decreased level of consciousness are characteristic symptoms and there may be quick progress to coma. Hemorrhagic stroke is usually associated with longstanding and uncontrolled hypertension [6]. Studies in Nigeria have confirmed hypertension as the most dominant risk factor of stroke [7]. As regards age, younger people seem to be more affected with hemorrhagic stroke than ischemic stroke. Diabetes mellitus has been reported in up to 20-37% of patients with stroke [5]. Cardiac diseases, especially rheumatic valvular heart disease which may be associated with atrial fibrillation causing embolic strokes are also common determinants of stroke [8]. Sex differences in stroke patients have not been consistent [5]. Other risk factors include cigarette smoking, neurosyphilis, heavy alcohol consumption, homozygous sickle cell disease, obesity, anaemia, dehydration, infections (including HIV), undernutrition, and congenital heart disease [9]. The management of stroke patients is practically divided into phases; the acute phase includes ambulance service and care, emergency room care, neuro-intensive care, and stroke unit management [10]. The sub-acute phase management is mainly supportive and takes place in the stroke care ward and physiotherapy unit. The chronic phase takes place in the community and outpatient clinic [10]. Thrombolytic therapy which is the mainstay in the management of ischemic stroke cannot be instituted until the doctor can confidently diagnose the patient as suffering from an ischemic stroke because this treatment might increase bleeding and could make a

hemorrhagic stroke worse [10]. However, inadequacies in the availability of advanced diagnostic tools in Nigeria have made this challenging [4]. Rehabilitation forms a cornerstone in managing post-stroke-related disabilities. In rehabilitating a stroke patient, physical therapy, occupational therapy, speech, and language therapy are instituted [11]. Many stroke patients require psychological or psychiatric help after a stroke because psychological problems such as depression, anxiety, frustration, and anger are common post-stroke disabilities [11]. Stroke is a debilitating syndrome both physically and emotionally. This necessitates the evaluation of patterns, risk factors, outcomes among stroke survivors, and the vocation that is mostly affected. Very few studies have been done to assess the patterns of stroke, risk factors, presentation, management, and outcome of management of stroke in the South-eastern region of Nigeria [5] and none have been carried out in hospitals in Anambra state. Hence, this has created a knowledge gap that this study intends to fill by undertaking a five-year review of stroke patients managed at the physiotherapy department of the Nnamdi Azikiwe University Teaching Hospital.

MATERIALS AND METHODS

Research design

A retrospective research design was used for this study.

Research Population

The sample size of 100 for this study was selected via a simple random sampling from the 150 case files of stroke survivors who met the inclusion criteria managed at the Department of Physiotherapy, Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi.

Inclusion Criteria

The following case files were included

Case files of stroke survivors between January 2016 and December 2020.

Case files of stroke survivors who were admitted and managed at NAUTH, Nnewi

Case files of stroke survivors who attended physiotherapy in the department of physiotherapy of NAUTH within the period under review.

Case files of stroke survivors who were referred for physiotherapy from NAUTH,

Exclusion Criteria

The following case files were excluded

Case files with incomplete patient details.

Case report without a definitive diagnosis

Case files of stroke survivors who were not managed at NAUTH, Nnewi

Sample size and Technique

100 case files were selected through a simple random technique from the 150 case files that met the inclusion criteria.

Research Instrument

A self-developed pro forma was used for the recording of retrieved case report data. The retrieval sheet consisted of three sections namely, A, B, and C. Section A contained socio-demographic data of patients including age, gender, occupation, marital status, number of children. Section B contained diagnostic data of patients including the date of diagnosis, type of stroke diagnosed, duration of stroke. Section C contained data on the risk factors associated with stroke among the patients.

Ethical Consideration

Ethical approval was obtained from the Ethical Review Committee of the Faculty of Health Sciences and Technology, Nnamdi Azikiwe University before the commencement of the study. Approval was sought and obtained from the head of the Department of Physiotherapy, in Nnamdi Azikiwe University Teaching Hospital to have access to the case files. The purpose and procedure of the study were explained to the Head of the Department, and the Head of the recording unit in the Physiotherapy Department NAUTH before data collection.

Procedure for data collection

The stroke survivors that fall within the period of study were identified from the departmental records

unit and subsequently retrieved from the medical records department. Seven members of the research team were involved in the retrieval and documentation of data from the stroke survivors' case files using approved proforma - three persons did the retrieval of the case files, the two persons oversaw the crosschecking of completeness of the documented clinical details, and the remaining two persons did documentation of the retrieved data in the proforma. This data retrieval process was done three times per week and it lasted for four weeks. Also, two members were involved in the final scrutiny of the completed proforma for accuracy of data imputation and possible missing data before it was subjected to data analysis. This last stage ensured that a clean copy of the collated data was ready for

Data Analysis

Data were analyzed using the IBM SPSS Version 21. The descriptive data comprising the participants' socio-demographic data were summarized using frequency counts and percentages, mean and standard deviation. Chi-square analysis was used to test for association between the non-continuous data. The alpha level will be set at 0.05. There was no record of missing data after the analysis.

RESULTS

Table Legend

Table 1: There were more female stroke survivors than males (52% and 48% respectively). The least frequent age was 30-40 years (6%), while the highest was 51-60 years (38%). Most stroke survivors were married and had five or fewer children (55%). **Table 2:** Among the socio-demographic factors, the number of children given birth to was significantly associated with the type of stroke.

Table 3: The comorbid risk factors did not show any statistical significant association with the stroke subtype.

Figure Legend

Figure 1: This shows that 2020 recorded the highest number of stroke survivors in the physiotherapy department followed by 2019, 2017, 2018, and 2016

respectively. Fig. 2: The most recorded occupation group was traders (37%), followed by civil servants (11%). The occupation of five stroke survivors was not recorded in the case files reviewed. Fig. 3: Stroke types - ischemic 84%, haemorrhagic 16% Fig.4: Left hemispheric stroke (58%) was more common than right hemispheric stroke (39%) and more so, brainstem stroke. Fig.5: The most common comorbid risk factors were hypertension (80%), diabetes mellitus (39%), and high cholesterol (14%).

Table 1: Socio-demographic characteristics

Variables		Frequency(100)	Percent (%)
Gender	Female	52	52
	Male	48	48
	Total	100	100
Age range	30-40	6	6
	41-50	11	11
	51-60	38	38
	61-70	28	28
	Above 70	17	17
Marital status	Married	93	93
	Single	4	4
	Widowed	3	3
Number of children	5 or less	55	55
	More than 5	45	45

Table 2: Association between the type of stroke and gender, marital status, number of children, family history of stroke, and occupation.

		Ischemic	Haemorrhagic	Total	X ²	P
Gender	Female	42	10	52	0.841	0.359
	Male	42	6	48		
Marital status	Married	78	15	93	0.814	0.666
	Single	3	1	4		
	Widowed	3	0	3		
	Above 70	16	1	17		
Age range	30-40	6	0	6	8.753	0.068
	41-50	9	2	11		
	51-60	34	4	38		
	61-70	19	9	28		
	Above 70	16	1	17		
Number of children	5 or less	50	5	55	4.341	0.037
	More than 5	34	11	45		
Family history	Yes	8	2	10	0.132	0.716
Occupation					19.649	0.544

Table 3: Association between risk factors for stroke and type of stroke.

Variables	Ischemic N(% in ischemic)	Haemorrhagic (% in haemorrhagic)	Total	X ²	P
Hypertension	70 (83.3%)	10 (62.5%)	80	0.741	0.544
Diabetes mellitus	33 (39.3%)	6 (37.5%)	39	0.018	0.893
Heart failure	2 (2.3%)	0	2	0.389	0.533
Alcohol	5 (5.95%)	1 (6.25%)	6	0.002	0.963
Peptic ulcer disease	3 (3.57%)	1 (6.25%)	4	0.251	0.616
Stroke	3 (3.57%)	0	3	0.589	0.443
Hepatitis c	1 (0.12%)	0	1	0.192	0.661
Brain tumour surgery	1 (0.12%)	0	1	0.192	0.661
High cholesterol	12 (14.3%)	2 (12.5%)	14	0.036	0.85

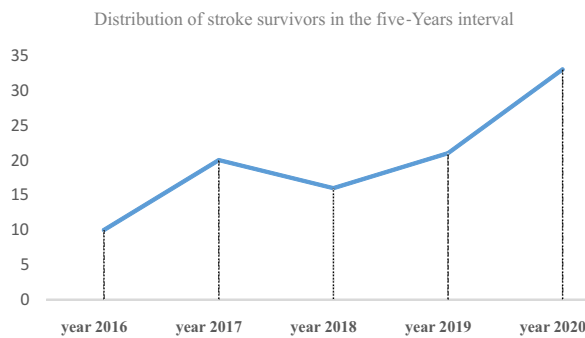


Fig 1: A line graph showing the distribution of recorded stroke survivor cases in the studied time frame

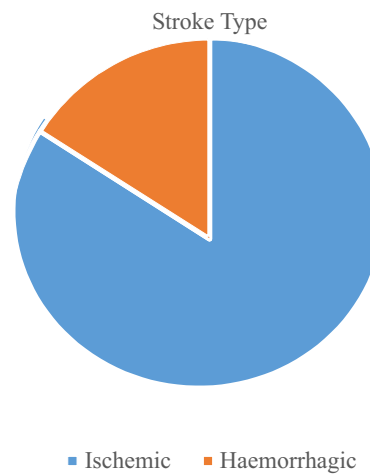


Fig 3. Shows stroke type over the period of study

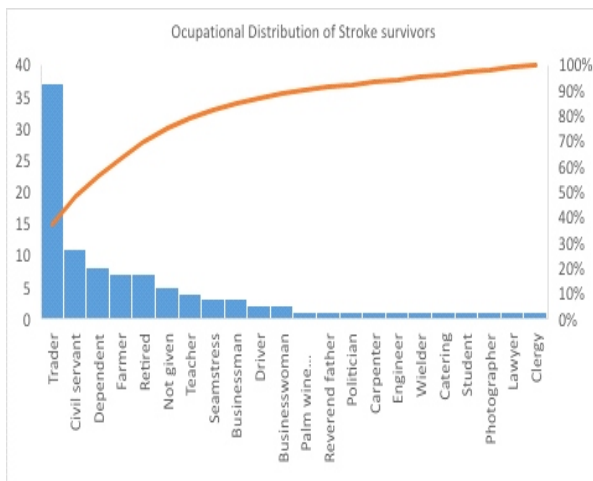


Fig 2: A clustered Bar Chart Showing Occupational distribution of stroke survivors

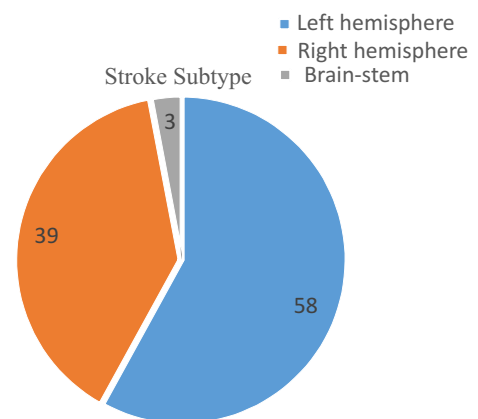


Fig 4. Shows stroke Subtype

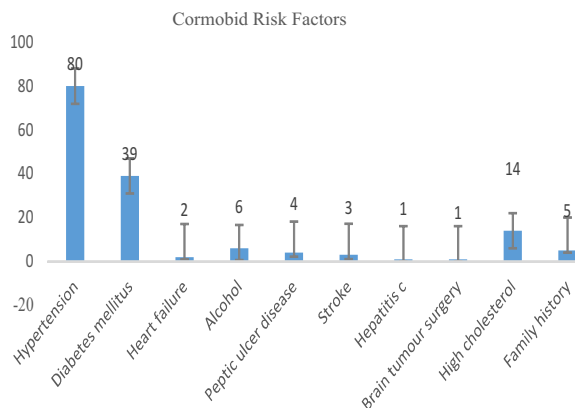


Fig 5. The Error Bar Chart Showing Comorbidity Risk Factors

DISCUSSION

This study evaluated the pattern of stroke and stroke-associated risk factors in patients being rehabilitated at the physiotherapy Department, NAUTH. Most of the patients in this study were above the age of 50 years but below the age of 70 years. Similar studies on the Iranian stroke patients reported relatively older patients than the current study [12, 13]. Also, the current study confirms the conclusions reached by MahdiHabibi-koolae et al. [14] that the average age of stroke incidence among stroke patients is declining to younger ages. This trend can be attributed to a shift in prevalence of vascular risk factors towards younger adults; a meta-analysis of ischemic stroke data showed a sharp increase in the prevalence of hypertension followed by hypercholesterolemia over the age of 35 years and interestingly a striking increase in the number of risk factors per patient just over 35 years of age [15]. A greater number of the patients in this study were females (table 1). Ahangar et al. [16], reported that the incidence of stroke among female patients was relatively higher than male patients; whereas the study conducted by Branyan and Sohrabji [17] revealed that there was a greater prevalence of stroke in females especially older females, and this prevalence may be linked to certain risk factors like loss of estrogen after menopause, hypertension, oral contraceptive use, and atrial fibrillation. The female gender prevalence in this study implies that the female population is more

likely to experience a stroke. Also, the year 2020 recorded the highest number of stroke cases compared to previous years studied (Fig.1). This could be attributed to declining awareness of the risk factors of stroke, and poor compliance to healthy living among the population of the study.

In this study, a significant association was found between the number of children and the pattern of stroke (Table. 2). This may probably be due to stress from pregnancy, childbirth, and childcare which may cause uncontrolled hypertension, fatigue, preeclampsia or eclampsia, and insufficient time for exercise. The authors opined that giving birth to several children or reproductive experiences might increase the systemic metabolic rate. The implication is that multiparous women are at increased risk of experiencing a stroke. The finding that most of the stroke survivors were traders (Fig. 1) might be linked to the fact that the population of the study belongs to the Igbo race often known for their merchandising activities. So there is a high possibility that the dominant occupational population might be more affected by stroke than any other population.

The current study finding also indicates that the number of ischemic stroke survivors was three times as high as hemorrhagic stroke survivors (Fig. 3). This study outcome is in agreement with two previous findings, firstly, there is a higher prevalence of ischemic stroke compared to hemorrhagic [18, 19]; and secondly, there is a better survival chance for ischemic stroke compared to hemorrhagic stroke [20]. Interestingly, Habibi-koolae et al. [14], reported 70.7% ischemic stroke incidence and 29.3 % hemorrhagic stroke incidence.

The current finding also showed that there was higher left hemispheric stroke prevalence than right hemispheric stroke (Fig. 4). This difference has been attributed, partly, to the origin of the left carotid artery from the aorta [21]. The findings of Hedna et al. [22], indicate that left-hemispheric are more common, more severe, and result in poorer outcomes than right hemispheric strokes. They suggested that these hemispheric differences in frequency and outcomes were particularly due mainly to the higher incidence of large vessel strokes in the left middle cerebral artery. In general, the current study identified the

presence of some risk factors such as hypertension, diabetes mellitus, and dyslipidemia (Fig. 5), all of which have been reported in previous literature[23]. It has been established that hypertension is a major risk factor for stroke, both ischemic and hemorrhagic[24]. In this study, although the most frequent risk factor in both ischemic (70%) and hemorrhagic (14%) stroke subtypes is hypertension, the chi-square test showed that association with a particular type was not statistically significant (Table 3). This statistical observation was likely due to the relatively smaller occurrence of hemorrhagic stroke survivors. MahdiHabibi-koolae *et al.* [14] in addition to making a similar finding as this current study concerning hypertension, also reported through regression model of all risk factors that the prevalence of hypertension in ischemic stroke patients is 1.755 times higher than hemorrhagic stroke patients. Furthermore, a prospective study of 50,000 adults in the Golestan by Sepanlou *et al.* [25], showed a positive association between hypertension and stroke mortality although they did not consider stroke subtypes. The role of hypertension in the pathogenesis of stroke has been reported to include the initiation of vasculopathy, promotion of micro atheroma, lipohyalinosis, atherosclerotic diseases, and blood-brain barrier disruption [20]. A meta-analysis study of clinical trials reported that the incidence rate of stroke was dropped by 41% when both systolic and diastolic blood pressure were reduced [26]. It has also been shown that antihypertensive therapy and lifestyle modification can reduce the risk of stroke and its recurrence. This is why lowering hypertension risk profile through lifestyle changes starting in middle age can prevent cardiovascular events in older ages [27].

Another important risk factor we identified in this study was diabetes mellitus, particularly with the ischemic subtype (Fig. 4). According to the current finding, 39% of all stroke patients were diabetic and this is in agreement with Hosaini *et al.* [20], whose findings showed that 29.3% of all stroke patients had hyperglycemia. Also, the prevalence of diabetes in ischemic stroke patients was higher than that in patients with hemorrhagic stroke. We related the finding to a previous research study and found that

diabetes causes several metabolic and pathologic changes that lead to stroke, including arterial stiffness, systematic inflammation, endothelial dysfunction, and heart failure [28]. Because these changes increase stroke in diabetic patients, controlling diabetes can prevent both primary and secondary stroke and may decrease mortality as well [29]. Clinical studies suggest that improvements in nutrition and dietary pattern, besides weight management, in diabetic patients, lower cardiovascular disease incidence significantly [29]. Thus, dietary components and nutritional patterns should be incorporated into any prevention strategy at the national level [30]. In the current study, we also found that high cholesterol level was present in 14% of the stroke patients (Fig. 4). A previous study has strongly associated dyslipidemia with the incidence of total stroke ($P < 0.05$), which was also consistent with previous findings [14, 31, 32]. The prevalence of dyslipidemia in ischemic stroke patients was higher than in hemorrhagic stroke cases. Atherosclerosis is the major mechanism of dyslipidemia, which leads to stroke [33]. It seems that reducing lipid profile can reduce atherosclerotic plaques, which results in a decreased risk of stroke [33]. Interestingly, the previous study has revealed that low-density lipoprotein cholesterol levels equal to or greater than 130 mg/dl confer a higher risk of ischemic stroke, but individuals with high triglycerides and low high-density lipoprotein levels who were also suffering from diabetes showed more than 2 times higher incidence of ischemic stroke [33]. The previous study has reported a significant association between dyslipidemia and diabetes [14]. This may imply that the coincidence of two risk factors, namely, diabetes and dyslipidemia, already double the risk of ischemic stroke incidence and such at-risk populations should be given priority in prevention programs. According to National Stroke Foundation, Australia, stroke is also a risk factor of stroke, someone who has already experienced a stroke is at increased risk of having another. After a person experiences a stroke or mini-stroke, the likelihood of having another is significant, the risk is highest early after the first stroke [34].

The study has these limitations. Poor record-keeping by the hospital under study made retrieval of patient

data difficult and time-consuming. The low sample size population may affect the generalizability of the study.

CONCLUSION

The results from this current study have shown that ischemic stroke was more prevalent than hemorrhagic stroke, and so was left hemispheric stroke in the studied population. The most prevalent comorbid risk factors were hypertension, diabetes mellitus, and high cholesterol. Also, traders were mostly affected, and the only significant association was found between the number of children and the pattern of stroke. The authors recommend that stroke survivors with comorbid risk factors should be alerted and advised on how to manage such risk factors. Specifically, clinicians should adopt dietary approaches to stop hypertension during young adulthood to middle age as a healthier diet significantly contributes to a lower risk of developing hypertension and consequently cardiovascular events such as stroke in the elderly. Family planning should be encouraged among couples to avoid the excessive burden that may predispose them to stroke. Awareness about risk factors of stroke should be conducted amongst traders to lessen the risk posed to the traders who emerged as the most population. Further studies should be carried out to compare the influence of each comorbid risk factor against an equal number of ischemic and hemorrhagic strokes. Also, a multi-site based study should be conducted to compare the outcome with the current study.

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Author Contributions

UPO, EMA, EYI, IUO and ECO conceptualized and designed the study. UNA, AVE, IBN, IAA, and CAO were involved in the writing and revision of the manuscript. The authors read, approved the final manuscript and agree to be accountable for all aspects of the work.

Conflicts of interests

There are no conflicts of interest amongst the authors.

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Data Statement

Data is with the corresponding author and will be made available on a reasonable request.

Ethical approval

The study was approved by the Institutional Ethics Committee.

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