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PREVALENCE AND PATTERN OF STROKE CASES SEEN AT THE NEUROLOGY CLINIC OF PHYSIOTHERAPY DEPARTMENT, UNIVERSITY OF PORT HARCOURT TEACHING HOSPITAL, PORT HARCOURT: A TEN-YEAR RETROSPECTIVE STUDY

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ABSTRACT

Background: Stroke is a condition of public health concern. It affects people of different age brackets, leading to long-term debilitation with a significant percentage of survivors left with permanent disabilities. **Methods:** The study adopted a descriptive retrospective study design in which the data of a total of 338 adult male and female stroke patients who attended the neurology clinic of Physiotherapy Department, University of Port Harcourt Teaching Hospital (UPTH), between December 2012 and December 2022 were retrieved and studied following ethical clearance. Data were analysed using the Statistical Package for Social Science (SPSS) version 25. Descriptive statistics was used to present the data in frequency tables. **Results:** Stroke 338 (70.4%) was the most prevalent type of neurological condition seen. Majority of the stroke patients were male 208 (61.5%), married 300 (88.8%), and between the ages of 51 and 60 (28.7%). The most common type of stroke was ischaemic stroke 295 (87.2%) with majority between the age bracket of 61-70 (26.6%). First episode of stroke was the most prevalent 301 (89.0%) with majority of the survivors between the age bracket of 51-60 (25.7%). Hypertension was the most prevalent risk factor 195 (57.7%) and was also most prevalent among the age bracket of 51-60 (16.0%). Lastly, majority of the stroke patients had right sided hemiparesis 192 (56.9%). **Conclusion:** Stroke is the major type of neurological condition among functionally impaired patients who undergo physiotherapy treatments. The risk factors and clinical presentation of stroke vary from individuals to individuals. Adequate education, counselling, medical, and financial support should be given to stroke survivors in order to prevent and manage the condition.

KEYWORDS: Prevalence, Pattern, Stroke Cases, Neurology Clinic, Physiotherapy Department, UPTH.

INTRODUCTION

Stroke also known as cerebrovascular accident is a form of brain injury which occurs by sudden blockage and interruption of blood supply to the brain [1]. It is described as a disorder that is identified by a quick onset of neurological signs and may be ischaemic or haemorrhagic in nature [2]. Over 87% of strokes are ischaemic; about 9% are from intracranial haemorrhage while about 4% are due to subarachnoid haemorrhage [3]. 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 [4]. Several risk factors have been associated with the occurrence of stroke [5]. The prevalence of stroke ranges from 536 to 8000 per 100,000 of the world population [4]. The case fatality in Africa averages about 35% but could be as low as 14.9% or as high as 77% when stroke is due to cerebral haemorrhage [5, 6]. According to Adigwe et al., [7], the prevalence of stroke in Nigeria is 1.14 per 1000 persons and a 30-day case fatality rate of 40%, and males more affected (males: female = 1.5:1). In Nigeria, stroke is a major cause of neurological admissions and its incidence has been on the increase due to rise in the incidence and prevalence of hypertension and diabetes [8, 9].

About 15 million people suffer stroke worldwide each year, out of which 5 million die and the other 10 million are left permanently with disability [10]. It is one of the most devastating neurological diseases, often causing death or gross physical impairment or disability [11]. Johnson et al., [12] posited that a rise in blood pressure has considerable effects on stroke sufferers. According to Johnson et al., [12], high blood pressure is the major cause of stroke, accounting for about 80% of stroke cases worldwide. Stroke is the third leading cause of death after heart disease and cancer [13]. According to the Heart Disease and Stroke Statistics, approximately 700 000 strokes occur each year in the United States, leaving 500 000 stroke survivors with disability, and economic loss resulting from stroke approaches an estimated $51.2 billion annually [14]. According to the American Heart Association, stroke is the leading cause of long-term disability, causing reduced mobility in more than half of survivors over 65 years old [15].

The management of patients with stroke is a multidisciplinary team approach involving neurologists, physiotherapists, occupational therapists, language and speech therapists, and psychologists. It is divided into phases; the acute phase includes ambulance services and care, emergency and neuro-intensive care [16]. The sub-acute phase management is supportive and takes place at the stroke wards and physiotherapy units. The chronic phase takes place in the community and at the out-patient clinics [16]. Physiotherapists aim at restoring the lost or impaired functional ability of the stroke survivor and thereby restoring activities of daily living and community re-integration through the use of correct positioning, mobilization to prevent deformity due to immobility, balance training, sitting re-education, standing and walking re-education [17]. The highest priority for many people with limited mobility after stroke is to walk independently. When walking performance is poor after stroke, community integration is limited and people may become housebound and isolated from society [18].

Therefore, this study will reveal the prevalence and pattern of presentation, clinical characteristics and the socio-demographic distribution of the stroke survivors who attended the neurologic clinic of physiotherapy department, University of Port Harcourt Teaching Hospital (UPTH) within the years under review. This can serve as a guide to physiotherapists in clinical decision making. Hence, this study is aimed at determining the prevalence and pattern of stroke cases seen at the neurology clinic of physiotherapy department UPTH over a period of ten years.

METHODS

Study design

The study adopted a descriptive retrospective study design.

Study Area

The study was conducted at the neurology clinic of Physiotherapy Department, University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt. The neurology clinic of Physiotherapy department is one of the eight specialty units of the physiotherapy department which takes care of the assessment and rehabilitation of neurological conditions sent to the department on out-patient bases. It is a sub-unit of the Neurology/Mental Head Unit of the physiotherapy Department. UPTH is a major tertiary-care teaching and research facility in Rivers State and attends to the medical need of about 200,000 patients annually in both outpatient and inpatient settings.

Study Subjects

The study subjects consisted of all adult male and female stroke patients undergoing rehabilitation at the neurology clinic of physiotherapy department, University of Port Harcourt Teaching Hospital, Port Harcourt, between December 2012 and December 2022.

DATA Collection

The folder/case notes and attendance list of all adult male and female stroke patients attending the neurology clinic of physiotherapy department, University of Port Harcourt Teaching Hospital, between December 2012 and December 2022 were retrieved and studied following ethical clearance.

Data Analysis

The data collected were collated, coded and analysed using the computer software [(Statistical Package for Social Science (SPSS)] package version 25. Descriptive statistics was used to present the data in frequency tables.

Ethical Clearance

Ethical approval for the study was obtained from University of Port Harcourt Teaching Hospital Ethics Research Committee.

RESULTS

Table 1 *(Prevalence Analysis of the Different Types of Neurological Conditions (n = 480))*

CONDITION	FREQUENCY (n)	PERCENTAGE (%)
Stroke (with Facial Nerve Palsy)	57	11.9%
Stroke (without Facial Nerve Palsy)	281	58.5%

	338	**70.4%**
Bell's Palsy	81	16.9%
Parkinson's Disease	8	1.7%
Cerebellar Ataxia	20	4.2%
Muscular Dystrophy	12	2.5%
Amyotrophic Lateral Sclerosis	3	0.6%
Cord Compression Syndrome	5	1.0%
Transverse Myelitis	3	0.6%
Brachial Plexus Injury	1	0.2%
Multiple Sclerosis	5	1.0%
Guillain-Barre Syndrome	4	0.8%

Table 1 describes the different types of neurological conditions seen at the neurology clinic of the physiotherapy department UPTH within the years under review. It revealed that stroke 338 (70.4%) was the most prevalent type of neurological condition seen in this clinic within the period. This was followed by Bell's palsy 81 (16.9%) while the least condition seen was brachial plexus injury 1 (0.2%).

Table 2 *(Socio-Demographic and Prevalence analysis of the Stroke Cases (n =338))*

Variables	**Sub-variables**	**Frequency (Percentage)**
Age (Years) of the Subjects	10-20 years	2 (0.6%)
	21-30 years	8 (2.4%)
	31-40 years	20 (5.9%)
	41-50 years	87 (25.7%)
	51-60 years	97 (28.7%)
	61-70 years	92 (27.2%)
	71-80 years	25 (7.4%)
	81-90 years	7 (2.1%)
Gender	Male	208 (61.5%)
	Female	130 (38.5%)
Marital Status	Single	18 (5.3%)
	Married	300 (88.8%)
	Divorced	7 (2.1%)

	Widowed	9 (2.7%)
	Separated	4 (1.2%)
Occupation	Unemployed	5 (1.5%)
	Driver	7 (2.1%)
	Farmer	17 (5.0%)
	Fisherman	4 (1.2%)
	Gardner	2 (0.6%)
	Business	72 (21.3%)
	Student	5 (1.5%)
	Trader	32 (9.5%)
	Applicant	5 (1.5%)
	Teacher	10 (3.0%)
	Housewife	6 (1.8%)
	Builder	2 (0.6%)
	Tailor	3 (0.9%)
	Caterer	1 (0.30%)
	Civil Servant	63 (18.6%)
	Public Servant	13 (3.9%)
	Lecturer	5 (1.5%)
	Banker	4(1.2%)
	Company worker	1 (0.30%)
	Architect	2 (0.6%)
	Engineer	4 (1.2%)
	Retiree	40 (11.8%)
	Nurse	6 (1.8%)
	Medical Doctor	7 (2.1%)
	Pastor/Clergy	6 (1.8%)
	Evangelist	2 (0.6%)
	Lawyer	3 (0.9%)
	Accountant	2 (0.6%)
	Estate Surveyor	1 (0.30%)
	Mechanic	1 (0.30%)
	Estate Manager	1 (0.30%)
	Unknown	6 (1.8%)
Educational Level	Primary	31 (9.1%)
	Secondary	114 (33.7%)
	Tertiary	168 (49.7%)
	Unknown	25 (7.4%)
Religion	Christianity	310 (91.7%)
	Islam	15 (4.4%)

	Traditionalist	5 (1.5%)
	None	8 (2.4%)

Table 2 gives a description of the socio-demographic characteristics of the stroke patients in terms of age, gender, marital status, occupation, educational level, and religion. In terms of age, majority of the subjects were between the ages of 51 and 60 (28.7%) followed by the ages between 61 and 70 (27.2%). With regards to gender, majority of the subjects were males 208 (61.5%) while a smaller percentage was female 130 (38.5%). This table also revealed that most of the subjects were married 300 (88.8%) while the least were separated 4 (1.2%). In terms of employment status, majority of the stroke patients were business men and women 72 (21.3%) followed by civil servants 63 (18.6%). When it comes to educational level, majority of the subjects had tertiary education 168 (49.7%) followed by secondary education 114 (33.7%). In terms of religion, majority of the subjects were Christians 310 (91.7%) while the least were traditionalists 5 (1.5%).

Table 3 *(Prevalence and Episodes of presentation of the Stroke Cases (n = 338))*

Variables (Age)	**Type of Stroke**		**Episode**		
Years	**Ischaemic n (%)**	**Haemorrhagic n (%)**	**First n (%)**	**Second n (%)**	**Third n (%)**
10-20	0 (0%)	2 (0.6%)	2 (0.6%)	0 (0%)	0 (0%)
21-30	3 (0.9%)	5 (1.5%)	8 (2.4%)	0 (0%)	0 (0%)
31-40	14 (4.1%)	6 (1.8%)	20 (5.9%)	0 (0%)	0 (0%)
41-50	67 (19.8%)	20 (5.9%)	83 (24.6%)	4 (1.2%)	0 (0%)
51-60	89 (26.3%)	8 (2.4%)	87 (25.7%)	8 (2.4%)	2 (0.6%)
61-70	90 (26.6%)	2 (0.6%)	79 (23.3%)	11 (3.3%)	2 (0.6%)
71-80	25 (7.4%)	0 (0%)	17 (5.0%)	7 (2.1%)	1 (0.3%)
81-90	7 (2.1%)	0 (0%)	5 (1.5%)	2 (0.6%)	0 (0%)
TOTAL	**295 (87.2%)**	**43 (12.8%)**	**301 (89.0%)**	**32 (9.6%)**	**5 (1.5%)**

From the results of ***table 3***, it can be observed that majority of the patients had ischaemic stroke 295 (87.2%) while a much smaller percentage had haemorrhagic stroke 43 (12.8%). In the same vein, the age bracket 61-70 constituted the highest number of stroke patients with ischaemic 90 (26.6%) stroke while the age bracket 21-30 constituted the higher number with haemorrhagic stroke 5 (1.5%). Also, majority of the stroke patients had their first episode of stroke 301 (89.0%) while the least percentage had their third stroke episode 5 (1.5%). The age bracket 51-60 constituted the highest number with

first episode of stroke 87 (25.7%) while the age bracket 61-70 constituted the highest number with second episode of stroke 2 (3.3%).

Table 4 *(Prevalence and Pattern of presentation of the Stroke Cases (risk factors and side of hemiparesis) (n = 338))*

Age Bracket	**Risk Factors**			**Side of hemiparesis**	
(Years)	**Hypertension (HTN) n (%)**	**Diabetes (DM) n (%)**	**Both HTN and DM n (%)**	**Right**	**Left**
				n (%)	**n (%)**
10-20	2 (0.6%)	0 (0%)	0 (0%)	2 (0.6%)	0 (0%)
21-30	8 (2.4%)	0 (0%)	0 (0%)	6 (1.8%)	2 (0.6%)
31-40	13 (3.8%)	0 (0%)	7 (2.1%)	11 (3.3%)	9 (2.7%)
41-50	53 (15.7%)	7 (2.1%)	27 (8.0%)	48 (14.2%)	39 (11.5%)
51-60	54 (16.0%)	15 (4.4%)	28 (8.3%)	55 (16.3%)	42 (12.4%)
61-70	44 (13.0%)	12 (3.6%)	36 (10.7%)	51 (15.1%)	41 (12.1%)
71-80	16 (4.7%)	4 (1.2%)	5 (1.5%)	15 (4.4%)	10 (3.0%)
80-90	5 (1.5%)	0 (0%)	2 (0.6%)	4 (1.2%)	3 (0.9%)
TOTAL	**195 (57.7%)**	**38 (11.3)**	**105 (31.2%)**	**192 (56.9%)**	**146 (43.2%)**

Table 4 gives a description of the prevalence and pattern of presentation of the stroke cases in terms of risk factors and side of hemiparesis. The result revealed that hypertension was the most prevalent risk factor 195 (57.7%) and was also most prevalent among the age bracket of 51-60 (16.0%). This is followed by 'both hypertension and diabetes' 105 (31.2%) which was prevalent among the age bracket 61-70 (10.7%). Also, majority of the stroke patients had right sided hemiparesis 192 (56.9%).

DISCUSSION

This study determined the prevalence and pattern of stroke cases seen at the neurologic clinic of the physiotherapy department, University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt. The folders/case notes of 480 patients with different neurological conditions were retrospectively studied following ethical clearance.

The result of this study revealed that stroke 338 (70.4%) was the most prevalent type of neurological condition seen in this clinic within the period under review. This agrees with previous studies [8, 9, 19]. According to Ekenze et al., [19], stroke is the leading cause of adult neurological admissions, constituting up to 65% of such admissions. The result of this study also revealed that majority of the stroke cases seen at the neurology clinic of physiotherapy department UPTH were male 208 (61.5%). This agrees with the findings of Adigwe et al., [7] and Oti et al., [20]. The reason for this could be due to the fact that men are usually more adventurous than females and are more likely to develop the risk factors of stroke such as hypertension, diabetes, smoking etc. through their eating and drinking habits. Secondly, being the traditional bread winners of their families in most cases, men are usually exposed to stressful and other unhealthy activities in order to make both ends meet. This view is, however, at variance with the position of Cordonnier et al., [21] who posited that hypertension and atrial fibrillation which are key risk factors for stroke are more frequent in women than in men. This difference can be due to the fact that the studies of Adigwe et al., [7], Oti et al., [20], and Cordonnier et al., [21] were carried out in different settings. While Adigwe et al., [7] and Oti et al., [20] conducted their studies in Nigeria which is in Africa, Cordonnier et al., [21] conducted theirs in Europe.

Furthermore, this study also found out that majority of the stroke patients were between the ages of 51 and 60. This finding seem to disagree with some previously published works which had reported that stroke is more prevalent among individuals aged 65 and above [22-24]. However, Feigin et al., [25] posited that stroke occurs in one in four people over the age of 25 globally. In the same vein, Krishnamurthy et al., [26] asserted that the burden of stroke in people younger than 65 years has increased over the last few decades, with the incidence increasing worldwide by 25% among adults aged 20 to 64 years. Also, there is a shift in the overall stroke burden towards younger age groups, particularly in low- and middle-income countries [27]. While both positions are supported by literature, one of the reasons the age bracket of 51-60 in this present study was the most prevalent could be the fact that most patients of geriatric age (over the age of 65) who attended the neurologic clinic were usually referred to the geriatric physiotherapy clinic for expert management. In the same vein, it was found that majority of the stroke patients were currently married 300 (88.8%). The reason for this finding could be linked to the cultural and belief system of most people in this part of the globe in which marriage is highly regarded and in which couples are encouraged to strive to make their marriage work despite the prevailing circumstances. The fact that majority of the patients were Christians 310 (91.7%) who usually do not see divorce as an option could also lend credence to this finding.

Furthermore, the results of this study revealed that the most common type of stroke was ischaemic stroke 295 (87.2%) with majority between the age bracket of 61-70. This finding agrees with Marsh et al., [3] which stated that "over 87% of strokes are ischaemic; about 9% are from intracranial haemorrhage while about 4% are due to subarachnoid haemorrhage." This means that haemorrhagic stroke accounts for 13% of the cases. It is also in tandem with the findings of Katan et al., [27] and Tadi et al., [28]. According to Tadi et al., [27], ischemic stroke accounts for 85% of all stroke cases while haemorrhagic stroke accounts for about 15% of all stroke cases. Katan et al., [27], on the other hand, stated that 62% of stroke cases are due to ischemia, 28% to intracerebral hemorrhage, and 10% to subarachnoid haemorrhage. Although the figures quoted by Katan et al., [27] seem to vary from that of the present study, one thing is clear: Ischemic strokes are generally more prevalent than haemorrhagic

stroke. This study also found out that first episode of stroke was the most prevalent 301 (89.1%) among the stroke cases. A fewer number had second episode while the least had third episode. The repeat episode of stroke was most prevalent among the age bracket of 61-70 years. The reason for this could be due to the fact that stroke patients of that age bracket are likely to have co-morbidities and also more likely not to adhere strictly to medications than younger age brackets.

The findings of this study also revealed that hypertension was the most prevalent risk factor for stroke 195 (57.7%). This finding agrees with previous studies [11, 29-31]. According to Wajngarten et al., [24], hypertension is the most prevalent risk factor of stroke accounting for more than 64% of all stroke cases globally. Johnson et al. [11] succinctly posited that high blood pressure is the major risk factor for stroke victims, which is reportedly the cause of over 80% of stroke cases globally. Furthermore, this study revealed that majority of the stroke patients had right sided hemiparesis 192 (56.9%). This is in tandem with the position of Oyewole et al., [32]. This means that left cerebrovascular accident with right-sided hemiparesis is on the increase. The implication for this is that right-handed individuals will have serious limitations and challenges in carrying out their activities of daily living which might negatively impact their socio-economic status.

CONCLUSION

Stroke is the major type of neurological condition among functionally impaired patients who undergo physiotherapy treatments. The risk factors and clinical presentation of stroke vary from individuals to individuals. Hypertension was the most prevalent risk factor. Adequate education, counseling, medical, and financial support should be given to stroke survivors in order to prevent and manage the condition. This should begin with primordial prevention. Strategies to maintain blood pressure, blood glucose level etc. such as health education, community mobilization etc. in a normal range should be explored before the actual development of the risk factors. Once risk factors are known, immediate and adequate measures should be given to prevent the occurrence of stroke. Once stroke has occurred, prompt medical and rehabilitation efforts should be employed to slow down the progress of the condition and prevent complications. Since stroke patients aged 51 years and above especially those in their sixties are very likely to have repeat stroke, proper education, care and medical attention should be provided to avert this situation as they go through their rehabilitation.

IMPLICATIONS FOR PRACTICE

This study has shown that a total of 338 stroke patients attended the neurology clinic of Physiotherapy department, University of Port Harcourt Teaching Hospital (UPTH), between December 2012 and December 2022 for physiotherapy treatment. This is 70.4% of the total number of neurological patients (480) seen within the period under review. This means that a very good number of stroke patients (70.4% of all neurological conditions) have been undergoing physiotherapy treatment in UPTH over the years. It shows that these patients really desire to improve in terms of functions and be independent of their families, care-givers, friends and the society at large. Worse still, a good percentage of these stroke patients are actually between the ages of 21 and 50 years which is known as the productive age bracket. This is worrisome and calls for more readiness for patient's care and improved infrastructure as far as the prevention, treatment and rehabilitation of these patients is concerned. Furthermore,

based on the pattern of presentation, it is obvious that these patients had ischaemic and haemorrhagic strokes, though ischaemic stroke was more prevalent. They were hypertensive, diabetic or both hypertensive and diabetic. It is also interesting to note that some of these patients had a repeat stroke. This calls for more health education for the adult populace concerning the risk factors of stroke and the strategies to prevent the occurrence of the disease condition. Every health institution at all level should brace up to ensure that quality medical and rehabilitative services for the management of stroke patients are offered at all times.

CONFLICT OF INTEREST DECLARATION

The authors declare no conflict of interest

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