Pattern of Stroke Presentation in Patients Managed at a Regional Teaching Hospital Centre in Nigeria: A Five Year Retrospective Study

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Abtract

Stroke or brain attack is the leading cause of death and neurological disability imposing emotional and financial burden on the family and society. The objective of the study is to identify the pattern of stroke patients provided with care at a regional teaching hospital centres in North Eastern Nigeria between January 2009 and December 2013. The methods used in this study are: In this retrospective survey, patients' records at the University of Maiduguri Teaching Hospital were scrutinised and a total of 384 folders of patients with diagnosis of cerebrovascular disease admitted between January 2009 and December 2013 were identified, retrieved and reviewed. Data obtained from the records include information on sociodemographic characteristics of the patients, stroke type, side of affectation, type of muscle weakness, stroke related impairments such as speech defect, blurred vision and cognitive deficit, and risk factors presented by patients. The results obtained were: This study showed that ischaemic stroke was the most prevalent type (80.8%), 80.3% of the patients presented with hemiplegia and there were more males (64.1%) than females (37.9%) with stroke during the period under review. Single survivors tend to present with haemorrhagic stroke than their married, widowed and widower counterparts ($p<0.01$) and men tend to present with left hemispheric and right side affectation more frequently than their female counterparts ($p<0.05$). Conclusively: In addition to providing insights into the provider identified problems suffered by stroke survivors, this study also identified improvement needs in care documentation that warrants attention.

Keywords: *Brain Attack, Stroke, Stroke Pattern, Stroke Impairments*

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Introduction

Stroke or brain attack is the leading cause of death and neurological disability in adults. This condition imposes emotional and financial burden on the family and society, and each year millions of stroke survivors have to adapt to a life with restrictions in activities of daily living as a consequence of the condition (World Stroke Organization 2012). Many surviving stroke patients often depend on other people for support in performing basic self-care activities (Biegel et al., 1991, Truelsen et al., 2000, Truelson 2002). In 2001, it was estimated that stroke accounted for 5.5 million deaths worldwide, equivalent to 9.6% of all deaths (World Health Organization, WHO 2002) and recent data shows stroke continues to wreck havoc by causing over 6 million death worldwide (WHO 2012). Because over two-thirds of these deaths occurred in people living in the developing countries including Nigeria, stroke is sometimes called a disease of developing nations (Kollen et al., 2006); where 40% of the deaths occurred in subjects aged less than 70 years.

Starting from over a decade ago, stroke was reported to be declining elsewhere in some developed countries such as United States and Britain (Garraway et al., 1979, Bonita et al., 2002, WHO 2002, Intercollegiate Stroke Working Party 2011). Presently, it is the general belief that stroke incidence is increasing each in the developing countries including Nigeria. The most common sign or physical presentation seen in a stroke patient is hemiplegia, although stroke can cause a variety of movement disorder, depending on the location and severity of the brain lesion (Donnan et al., 2008). Stroke survivors are predisposed to sedentary lifestyle, are often deconditioned leading to hypoactive lifestyle and are at increased risk for falls, recurrent stroke and other cardiovascular diseases (Neil et al., 2004, American Heart Association 2001). Stroke is also the leading cause of disability in adults (WHO, 1989) and a major cause of hospital admission in most industrialised countries (Bonita et al., 1990), and potentates falls among community dwelling adults often leading to readmission (Amu Hu, Wang, & Hwang 2005). Millions of stroke survivors have to adapt to a life with restrictions in activities of daily living as a consequence of the condition and many surviving stroke patients will often depend on other people's continuous support for basic self-care activities (Truelsen et al., 2000, Young and Foster 2007, Wahab 2008, Nordqvist 2014).

Consequent to the high mortality rate due to stroke and the debilitating impact of stroke on the survivors, their care givers and the burden of care often placed on society in general, many studies have been conducted on the incidence and patterns of stroke virtually all of which were hospital based, in Nigeria (Danesi, 1995, Njoku et al., 2004, Ogun et al., 2005, Komolafe et al., 2006). These hospital based retrospective studies were on stroke survivors in

tertiary hospitals located in parts of Nigeria, specifically in Sokoto in the Northwest (Njoku et al., 2004) and Ibadan in the Southwest (Ogun et al., 2005), and only one from North East (Maduagwu et al 2012). The only study from the Northeast that dwell on the co-morbidities and sociodemographic characteristics of stroke survivors for a three year period from 2009 through 2012.

Maiduguri in Borno State, is the largest city in the North-Eastern Nigeria. Due to terrorist insurgency, this city of approximately one million population (NPC 2004, NBS 2008) presently harbours internally displaced persons from over ten other local government areas of the state. As a regional hospital centre, this hospital is the referral centre for patients from Borno and three adjoining states in Nigeria, and also attracts patients from neighbouring countries including Chad and Cameroon. Compared to an earlier study at the same regional centre which limited its review to three years, there is the need for a review that would extend to longer years and cover wider scope of the phenomenon concerning stroke survivors, in order to gain a better picture of the patterns of stroke and clinical characteristics of survivors at the regional hospital centre. This study was therefore aimed to identifying the pattern of stroke presentation in the regional hospital in North East Nigeria, between January 2009 and December 2014.

Method

In this retrospective study, records of patients with diagnosis of cerebrovascular disease admitted to the University of Maiduguri Teaching Hospital between January 2009 and December 2013, were identified, retrieved and reviewed. Upon clearance by the local ethics committee, data of patients admitted to the Medicine wards of the University of Maiduguri Teaching Hospital over the five year period were obtained. Data obtained from the records includes information on sociodemographic characteristics of the patients including their age, weight, occupation, marital status and gender. Also obtained were information on aetiology, stroke type, side of brain lesion, type of muscle weakness, stroke related impairments such as speech defect, blurred vision and impaired cognition, and risk factors presented by the patients. Information about length of hospital stay, onset to admission interval, mortality, and other pertinent data about patients' progress and goals, obtainable in daily intervention and periodic re-assessment and discharge notes were also sought.

Data Analysis

Frequencies and percentages, mean and standard deviation were used to describe the data obtained and Chi Square was used to explore trends and patterns of the clinical signs and symptoms, by sociodemographic

characteristics, at an alpha level set at 0.05. Data analysis was performed using SPSS for Windows (version 5).

Results

A total of 384 diagnosed stroke cases were identified from the patients' registers at the hospital centre for the period under review. The mean age of the patients is 55.0 ± 13.2 years and survivors within the age group between 51- 60 years (n=120, 32.2%) were more than those in each of the other age groups. Information on age was missing in nine of the case notes reviewed. Majority of the patients (64.1%) were male and 84.8% were married. Those within the age group 51- 60 years accounted for 32.2% [n=120]. Male patients were in the majority (64.1%, n=246) while the females constituted 35.9% (n= 138). (*see* Table 1).

Table 1: *Sociodemographic characteristics of the stroke survivors*

Characteristics	**Frequency**	**%**
Gender:		
Male	246	64.1
Female	138	35.9
Marital status:		
Single	30	8
Married	318	84.8
Widowed	27	7.2
Occupation:		
White collar	89	23.4
Blue collar	117	30.7
Full-time house wife	129	33.9
Retiree	8	10.3
Unemployed	5	1.3
Age group:		
0—30	12	3
31-40	56	15
41-50	78	21
51-60	119	32
61-70	78	21

In addition, table 2 shows the clinical characteristics of the survivors. Majority of the survivors were presented with hypotonia (n=269, 78.4%) while 74 (21.6%) were presented with hypertonia. Muscle tone was not recorded in 41 cases. Ischemic stroke accounted for 83.3% (n=321) as against 63 (16.4%) with haemorrhagic stroke. A simple majority were

presented with right hemiplegia (n=207; 53.9%) as against 46.1% (n= 177) with left hemiplegia and there were more males (64.1%) than females (37.9%) with stroke during the period under review. For the cases within the years of review, hypertension alone accounted for 290 (79.5%) of the comorbidity out of a total of 384, while diabetes mellitus as a comorbidity was found in 94 (29.5%) of the patients whose records were reviewed.

Table 2: *Distribution by clinical characteristics and comorbidity*

	Frequency	**%**	**χ^2**	**P-value**
Side affected:				
Right side	207	53.9		
Left side	177	46.1	4.69	0.03
Muscle Tone:				
Hypotonia	269	78.4		
Hypertonia	74	21.6	212.1	0.000
Type of Stroke:				
Ischaemic	321	83.6		
Haemorrhagic	63	16.4	67.7	0.000
Co-morbidity:				
Hypertension	290	79.5		
Diabetes mellitus	94	20.5	78.3	0.000
Clinical symptoms:				
Speech problem	136	41.7		
Other symptoms (e.g. blurred vision etc.)	248	58.3	89.6	0.00
Pattern of Stroke:				
Hemiplegia	291	80.5		
Hemiparesis & Monoplegia	93	19.5	78.6	0.000

χ^2 denotes Chi statistical value

Among the clinical symptoms presented by the stroke patients whose records were reviewed, speech problem was documented for 136 (41.7%) out of a total of 384, in addition to other problems including blurred vision and cognition problem. Around 80% (n=291, 80.5%) had Hemiplegia, while hemiparesis and monoplegia combined constituted 19.5% (n=93). Differences were observed in some clinical characteristics by gender and by

marital status (Tables 3-4). Single survivors tend to present with hemorrhagic stroke than their married, widowed and widower counterparts ($p<0.01$) and men tend to present with left hemispheric and right side affectation more frequently than their female counterparts ($p<0.05$). Data on length of stay, onset to admission interval, mortality while in the hospital, and other pertinent data about patients' progress and goals, were also unobtainable from the records of each patient as contained in the case folders.

Table 3: *Difference in the side of stroke by gender*

	Male	Female	χ^2 Value	P -level
Side of Stroke				
Left	138 (56.9)	55 (47.1)	2.3	0.033
Right	103 (43.1%)	62 (52.9)	8.9	0.000

Table 4: *Differences in the type of stroke by marital status*

Type of Stroke	Single	Married	Widow	χ^2 value	P -level
Ischemic	20 (7.1%)	241 (85.2%)	23 (8 .1%)	6.494	0.039
emorrhagic	0 (0.0%)	57 (93.4%)	4 (6.6%)	5.39	0.000

Discussion

This study found 384 stroke cases for review and this number was higher than those recorded in the previous 5 years based on the comparison between the count in the period under review with that of the previous 5 years. The present review which showed that stroke was most prevalent among 51-60 years of age group than other age groups is arguably similar to the studies of Njoku et al (2004) and Floud et al (2014) both of which showed that the prevalent of stroke is higher among people within the mid age brackets than in other age brackets. In addition, the finding that showed males were more affected with stroke than females supports an earlier reports unveiled three years at the same centre (Mauagwu et al 2012) and is also in agreement with the findings of Mathew et al (2009) which showed that male stroke incidence is 46% higher than the incidence among the female.

Higher incidence of stroke observed among full time house wife in this study is similar to the finding in the study by Floud et al (2014) which shows most people affected were full time house wives, and also affirms earlier findings about survivors occupation from a three year study at the same centre

(Mauagwu et al., 2012). Additionally, the finding of this study that shows more married people have stroke than their single counterparts is similar to Floud et al's study (2014) which shows that 71% of the stroke survivors were married while only 4% were single. The present study's finding that shows males tend to have left side brain lesion than their female counterparts is similar to the observations in another study that shows more proportions of the males had left hemispheric lesions than the females (Roorda et al., 2012). But the finding varies with that of Ferhan et al (2009) review, which showed no significant proportional differences in the brain lesion side between male and female cases.

The present study shows that ischemic stroke tend to be more frequent among males than among the females, while the females showed higher prevalence of hemorrhagic stroke. This finding in accordance with that of Xiao-Ying (2012) which revealed that 81.5-85.6% of patient having ischemic stroke were males while less than 20% of the males having hemorrhagic stroke. Similarly, the finding of this research that revealed that there was no significant proportional differences on the side of lesion by gender is similar to that of the report by Mathew et al (2008). This study also shows that hypertension is more frequently associated with stroke, similar to the findings by Njoku et al (2004), which showed hypertension as the major comorbidity in stroke, compared to diabetes mellitus, or both hypertension and diabetes mellitus, thereby affirming hypertension as the most common modifiable risk factor of stroke (Thomson 2009).

Among the clinical symptoms presented by the stroke patients reviewed, speech problem had the highest prevalence than other symptoms presented such as visual impairment and cognition problem. However, no comparison could be made with this finding because there was no previous study reported on the prevalence of stroke related impairment. Results from this study showed that right sided hemiplegia accounted for significantly higher proportion of cases than left sided hemiplegia. This is in agreement with Komolafe et al (2002) that the right sided hemiplegia occurred in 60%, while left sided hemiplegia occurred in 32% of cases studied in Obafemi Awolowo University Teaching Hospital, Ile-Ife, Osun State, Nigeria. Hypotonia which has been hypothesised to be due to excessive inhibition of gamma activity from the cerebellum resulting in loss of postural tone (Bobath, 1990) was recorded for significantly higher proportion of cases than hypertonia in this study.

This study found that higher prevalence of ischemic stroke than haemorrhagic stroke and this is similar to the report by the National Association of Neurological Disorders and Stroke (2009) in which about

87% of stroke case was shown to be ischemic and the remaining 13% to be hemorrhagic. The finding of this study that shows a preponderance of ischemic stroke is in correspondence with the consensus on etiology of stroke (National Institute of Neurological Disorders and Stroke 2009). Overall, the sociodemographic characteristics and comorbidities of the survivors which is similar to the characteristics of the survivors in the present study is an indication of stability and consistency in the profile of stroke survivors.

It was observed in this study that there were some missing information on the file of the stroke survivors reviewed in this study. Outright unavailability of some data, combined with omitted data on sociodemographic and clinical characteristics such as age of participants and tone of muscle, in no small number of cases as observed in the course reviewing stroke case folders is an indication that documentation improvement is needed at this centrer. Information about how long patient stays on admission, the time interval between onset of stroke and admission and how long it took before referral to physiotherapy were not obtainable from the records and this unarguably minimises the scope of the finding in this study. Nevertheless the benefits of this study do not only lies solely on the profile of the stroke survivors and the identification of the problems stroke survivors suffered but extends also on the needs of improvement in documentation at this centre. A higher number of stroke survivors in the five year period under review, compared to the count within the preceding 5 year period, should be drawn with caution. This is because no trend can be ascertained merely by comparing survivors count in a five year period with that of the preceding periods only.

Conclusion

This study analysed the profile of stroke patients as managed at the University of Maiduguri Teaching Hospital between January 2009 and December 2013 which comprised of married male between 40 and 59 years of age, admitted for ischemic brain attack, presented with right hemiplegia and hypotonia and having hypertension as co-morbidity. The study also analysed less percentage of the females counterpart. In addition to providing insights into the provider identified problems suffered by stroke survivors, this study also identified improvement needs in care documentation unit that warrants attention in this regional hospital centre in Nigeria.

Study Limitations

Outright unavailability of some data including sociodemographic information on the survivors and their clinical characteristics and presentations poses a limitation that in some cases makes potentially fragments findings such as on the higher counts of survivors with hypotonia than that of Hypertonia. It is generally known that hypotonia of affected

extremities is usually the first signs following stroke and as time goes by, it is replaced by hypertonia. Absence of data on the time interval between stroke onset and physical assessment can be argued to mitigate the interpretation that can be made of the results that shows higher counts of survivors with hypotonia than hypertonia on initial assessment.

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