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The Prognosis of Acute Stroke in a Tertiary Health Centre in South-East Nigeria

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Abstract
Stroke is a common neurologic disorder and it is the third leading cause of mortality worldwide after ischaemic heart disease and cancer. This study determined the prognosis of acute stroke in Federal Teaching Hospital Abakaliki (FETHA) South-East Nigeria.It was a retrospective, descriptive and hospital based study conducted in a tertiary health centre in Abakaliki south-east Nigeria. The stroke register of the neurology unit was reviewed and relevant data were extracted and analyzed**.** Stroke accounted for 12% of medical death with 24hour, 7day and 30day mortality rate of 5%, 10% and 15% respectively. Factors associated with stroke mortality include advanced age, female sex, extremes of blood pressure, loss of consciousness and haemorrhagic stroke. There should be regular health education with emphasis on primary prevention of stroke. Also, stroke patients should be referred early to a stroke unit for adequate management.
Key words: stroke, mortality, Abakaliki, South-East, Nigeria

Introduction

Stroke is defined as rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin.[1] It affects both gender and is increasingly common from the sixth decade, although young patients are not exempted.[2] People of African descent are more susceptible than their Caucasian counterparts.[3]
The incidence of stroke is 254/100,000 person years in the United Kingdom (UK), 330/100,000 in Taiwan, and varies between 100 and 300/100,000 in the United State of America (USA).[4]
In Nigeria, the report of a Stroke Registry in Ibadan gave the incidence of stroke as 26/100,000 populations in 1977[5] but the result of a recent study in an urban community in Lagos gave an overall crude prevalence rate of 114/100,000.[6]
According to World Health Organization (WHO), stroke is the third leading cause of mortality worldwide (after cancer and ischemic heart disease), accounting for approximately 4.6 million deaths annually.[7] In industrialized countries, it accounted for about 10% of all deaths,[8] and in Nigerian hospitals, it constituted 3.7% of emergency admissions, 8.7% of medical admissions, and 4-17% of medical deaths.[9-13] Elsewhere in Africa, it accounted for 3.5% of all causes of hospital deaths; 8% of admissions at Korle Bu Hospital, Ghana, and 3.7% of total admissions in Ugandan hospitals.[5] Case fatality for stroke is generally accepted to be 12% within the first 7 days and 19% at 1 month for first-ever stroke, falling drastically to about 9% per annum after the first 30 days.[14]
In Caucasian populations approximately 80% of all strokes are ischemic, 10- 15%
intracerebral hemorrhage (ICH), 5% subarachnoid hemorrhage (SAH), and the rest is due to other causes of stroke.[15] Studies from Asian countries indicate that the proportion of ICH is higher than in Caucasians with approximately 20- 30% being hemorrhagic[16-19]
In Nigeria, the proportion of stroke types is in keeping with that of Asian countries. In a study in south-west Nigeria, 64.4% had ischemic stroke while 34.7% had hemorrhagic, with intracerebral hemorrhage accounting for 31.7% and subarachnoid hemorrhage accounting for 3.0%.[20]
There has not been any study on stroke in Abakaliki south-east Nigeria. Hence, the need for this study on the prognosis of stroke in a tertiary health centres in Abakaliki south-east Nigeria.

Methodology

The stroke register of the neurology unit of Federal Teaching Hospital Abakaliki (FETHA) was reviewed from 1st August 2012 to 31st May 2013. The patients were drawn from the emergency and medical wards. Relevant data like biodata, and clinical features of the patients were extracted and analyzed. The diagnosis of the type of stroke was made using World Health Organization (WHO) criteria. The data was analyzed using SPSS version 19. Chi-square with Yates' correction was used test for statistical significance and p-value of <0.05 was regarded as being significant.

Results

A total of 120 patients with stroke made of 70 (58.3%) males and 50 (41.7%) females (M:F≃3:2) were seen over the study period. The above constituted 11.4% of the medical admission over the period. The age range was 40-95 years with mean age of 61.54±12.54years (M= 62.10years, F= 61.06years). The age distribution and stroke

types are shown in table 1.
The sex distribution of stroke types with 30day mortality is shown in table 2.
Stroke constituted 12% of medical deaths. The 24hour, 7day and 30 day case mortality were 5%, 10% and 15% respectively. Sixty (50%) and 42 (35%) were independent and dependent respectively at 30 day post stroke. The determinants of outcome are shown in table 3.

Discussions

Stroke is the third leading cause of mortality worldwide (after cancer and ischemic heart disease), accounting for approximately 4.6 million deaths annually.[7] This study on the prognosis of acute stroke is the first in Abakaliki South-East Nigeria. A total of 120 patients presented with acute stroke over a ten (10) months study period. This is high compared to other hospital based studies which reported lower frequencies per unit time.[20,21] The disparity could be because this study was carried out in the only tertiary health centre in Ebonyi state which receives many referrals. Also, it could suggest increased stroke prevalence due to increasing major risk factors (hypertension, diabetes mellitus) for stroke.[22] Stroke constituted 11.4% of medical admissions which is close to 8.7% reported in some hospital studies[9-13] in Nigeria but higher than 4.5% reported by Desalu, et al. in South West Nigeria.[20] This further strengthens the argument of higher prevalence of stroke in Abakaliki South East Nigeria. The male to female sex ratio of 3:2 is in keeping with other studies that reported male preponderance.[23,24] The male sex has been listed as an independent risk factor for stroke.[25]
The age range in this study was 40- 95years with mean age of 62yrs. This is in keeping with other studies that reported mean age of 56- 68years.[20,21] The above age range is where the risk factors for stroke are most prevalent.[26]
The prevalence of stroke increased with age. The peak age prevalence (40%) was at the 7th decade of life. This is in keeping with the study of Desalu, *et al*. in south west Nigeria who reported same trend with 33.7% between 60- 69 age range.[20] Also, this closely approximates the findings of Owolabi et al[24] and Ogun et al.[27] The above could be from increased risk factors for stroke with increased age[26] and also decreased life expectancy in Nigeria. This explains why the prevalence reduced after the 7th decade of life.
Seventy (65%) had ischaemic stroke while 33(31%) and 5(4%) had intracerebral haemorrhage (ICH) and subarachnoid haemorrhage (SAH) respectively. This agrees with the study of Desalu, *et al*. who reported 64%, 31% and 3% for ischaemic, ICH and SAH respectively.[20]
Also Ezeala-Adikaibe et al had similar findings in Enugu south east Nigeria.[23] Seventy one percent of those <50yrs and 26% of those ≥50yrs had haemorrhagic stroke. This trend suggests that increasing age (or risk factors associated with age) increases the likelihood of infarct more than ICH. This is similar to other studies both in north western Nigeria[24] and in the United States of America (USA).[28] Forty (63%) males and 30 (68%) of females had ischaemic stroke. There is no significant sex predilection to particular type of stroke. This is in keeping with the finding of Watila et al.[21]
The 24hr, 7day and 30day hospital case mortality rate in this study were 5%, 10% and 15% respectively and it closely approximates the generally acceptable 7day and 30day case mortality rate of 12% and 19% respectively.[14] These mortality rates were lower than other studies that reported 24- 38%.[20,22]
This difference could be because majority of the patients in this study were managed with a defined stroke management protocol in a neurology unit. Stroke constituted 12% of all medical deaths. This is similar to 4-17% reported in some other hospital based studies in Nigeria.[9-13] Thirty five per cent and 50% of the patients were dependent and independent respectively after 30days.
Advanced age (≥80yrs), female sex, loss of consciousness, haemorrhagic stroke and extremes of blood pressure (BP) were associated with stroke mortality. Increased age is known to be associated with more severe stroke with attendant worse outcome.[29] This could be related to effect of age itself and age related co morbidities.
The higher female mortality rate was also reported by Sharma et al and this could be explained by loss of cardiovascular protective effects of female sex hormones in postmenopausal females.[30] Also, gender inequality especially in developing world could cause restriction to prompt and adequate health care services by dependent females.
Loss of consciousness is associated with haemorrhagic stroke, brainstem stroke and massive cerebral infarct and portends poor prognosis. Blood pressure rise following stroke is protective. It helps to maintain cerebral perfusion despite rise in intracranial pressure and loss of cerebral auto-regulatory mechanism. Low BP following acute stroke is associated with cerebral hypoperfusion and poor prognosis. Also, very high BP could worsen intracranial pressure and also could lead to recurrent stroke. This explains the association of extremes of BP with stroke mortality.
This study showed that stroke is highly prevalent constituting 11.4% of medical admissions in Abakaliki south eastern Nigeria. The mortality rate was relatively low compare to other hospital based studies. The factors associated with mortality include age ≥80yrs, female sex, loss of consciousness, haemorrhagic stroke and extremes of BP. It is recommended that public education be done regularly with emphasis on screening for the

risk factors for stroke. Also stroke patients should be referred early to a stroke unit for proper management because "time is brain". Patients with above identified factors should be managed in intensive care unit in order to reduce the risk of death.

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Table 1: Age distribution of stroke types and mortality

Age range	Ischaemic n (%)	ICH n (%)	SAH n (%)	Total N (%)	Mortality n (%)
40- 49	7 (29)	16 (71)	-	23 (100)	9 (39.1)
50- 59	11 (47)	10 (40)	3 (13)	24 (100)	-
60- 69	37 (77)	9 (19)	2 (4)	48 (100)	3(6.3)
70- 79	15 (100)	-	-	15 (100)	-
80- 89	5 (100)	-	-	5 (100)	3(60.0)
90- 99	4 (75)	1 (25)	-	5 (100)	3(60.0)
Total	77 (64)	37 (31)	6 (5)	120 (100)	18 (15.0)

Table 2: sex distribution of stroke types

Sex	Ischaemic n (%)	ICH n (%)	SAH n (%)	Total N (%)	Mortality n (%)
Male	43 (63)	22 (31)	5 (6)	70 (100)	6 (8.6)
Female	33 (68)	16 (30)	1 (2)	50 (100)	12 (24)
Total	77 (65)	37 (31)	6 (4)	120 (100)	18 (15)

Table 3: determinants of outcome

Factor		Dead n(%)	Survived n(%)	X^2	df	p- value
Age (yrs)						
	<80	12(10.9)	98(89.1)	13.690	1	0.0002
	≥80	6(60.0)	4(40.0)			
Sex	M	6 (8.6)	64 (91.4)	4.303	1	0.0381
	F	12 (24.0)	38 (76.0)			
MABP (mmHg)	<100	5 (55.6)	4 (44.4)	27.515	2	0.00000106
	100- 139	-	75(100)			
	≥140	13(36.1)	23(63.9)			
Diabetes mellitus		12 (21.4)	44(78.6)	2.524	1	0.1122
Loss of consciousness		14 (30.4)	32 (69.6)	12.044	1	0.0005
Stroke type:	Haemorrhagic	15 (34.9)	28(65.1)	18.421	1	0.0001
	Ischaemic	3(3.8)	74 (96.2)			

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