SOCIO- CLINICAL DEMOGRAPHICS OF STROKE CASES; A REFRESHER OF OUR BODY OF MEDICAL KNOWLEDGE

Osarenkhoe Osaretin John[1], Atoe Imagbe Oduwa[2], Iruolegbe Christoper[3]

[1]Department of Medicine, Igbinedion University Teaching Hospital, Okada, Edo state, Nigeria.
jefaghpublications@gmail.com
[2]Department of Medicine, University of Benin Teaching Hospital, Benin, Edo state, Nigeria.
oduwaatoe15@gmail.com
[3]Department of Medicine, Irua Specialist Hospital, Irua, Edo state, Nigeria.
ojemiega@yahoo.com

Abstract :

Introduction: Stroke or cerebrovascular Accident according to WHO is focal or global neurological deficit of vascular origin lasting more than twenty-four hours or resulting in death before twenty-four hours. Stroke is a health condition with global impact, causing significant morbidity and mortality worldwide. Many economies of the world commit to combating this problem. Worldwide and especially in sub Saharan.Africa, the victims are mainly in the productive age ranges, leading to huge economic loss.Stroke is currently the second leading cause of death worldwide after Ischaemic heart disease. Most strokes are preceded by modifiable risk factors. Controlling these risk factors would reduce the occurrence, morbidity and mortality of stroke.

Objectives: To evaluate the social and clinical demographics of stroke cases.

Method: This was a study on one hundred and twenty acute stroke (within 24 hours) cases carried out in UBTH. Data was analyzed using SPSS 21 software.

Results: The most common feature was facial palsy, impaired speech and headache in 56.7%, 53.3% and 26.7% of cases respectively. Hypertension was the most common risk factor for stroke in this study (76.7%) followed by Diabetes mellitus and obesity in 23.3% and 10.0% respectively.

Conclusion: Neural abnormalities are the most common features of stroke and hypertension is the most common risk factor. Hypertension is modifiable. The global effort to control and reduce the incidence of hypertension should be continued

Introduction

Stroke according to World Health Organization (WHO) is an acute neurological deficit of cerebrovascular origin that persists beyond twenty-four hours or is interrupted by death within twenty-four hours. It has been projected that stroke could soon be the most common cause of death worldwide as it is currently the second leading cause of death in the world, ranking after heart disease.[1]

Globally there is an increasing trend in the burden of non-communicable diseases especially cardiovascular and cerebrovascular diseases particularly in developing countries. Across Africa and in Nigeria the prevalence of stroke is also increasing. This transition imposes more constraints in dealing with the double burden of communicable and non-communicable diseases in a poor economy characterized by inadequate health systems.

This has been attributed to more people now living up to and beyond middle age because of improvement in sanitation and reduction in prevalence rate of infectious diseases coupled with increasing use of tobacco, westernized lifestyle and urbanization with reduced physical activity, increased caloric consumption and psychosocial stress also been implicated.

These acts synergistically to cause increased cardiovascular and cerebrovascular risk via weight gain, hypertension, dyslipidaemia, dysglycaemia and hyperuricaemia. By year two thousand and twenty it is predicted that non-communicable diseases will cause seven out of every ten deaths in developing countries compared with less than half that is obtained today.[2-9]

About eight hundred thousand people in the United States, have stroke each year, one hundred and thirty thousand of them die each year. One American dies from stroke every four minutes on average. Stroke cost the United States, an estimated $36.5 billion each year. Worldwide, stroke is the second leading cause of death after ischaemic heart disease, and is followed by lower respiratory tract infections, chronic obstructive lung disease, diarrhea and HIV/AIDS, as the leading six killers worldwide as at 2013.[10,11]

The incidence of stroke increases exponentially from thirty years of age, and the etiology varies with age. Advanced age is one of the most significant stroke risk factors. Ninety five percent of stroke occurs in people aged forty five and above, two-thirds of stroke occurs in those over the age of sixty five. [3,12]

Disability affects seventy five percent of stroke survivors enough to decrease their employability and stroke can affect patients physically, mentally, emotionally, or its combination. The result of stroke varies widely depending on size and location of lesion. Thirty to fifty percent of stroke survivors suffer post stroke depression, which is characterized by lethargy, irritability, sleep disturbance, lowered self-esteem and withdrawal while up to ten percent of all stroke patients develop seizures most commonly in the weeks subsequent to the stroke event and the severity of the stroke increases the likelihood of a seizure.[8, 13-15]

Stroke can be classified into 2 major categories; ischaemic stroke and haemorrhagic stroke [2]

Ischaemic stroke occurs as a result of an obstruction within a blood vessel supplying blood to the brain. It accounts for about eighty seven percent of all stroke cases. The underlying condition for this type of obstruction is the development of fatty deposits lining the vessel wall. This condition is called atherosclerosis. These fatty deposits can cause obstruction mainly as shown below; *Types of Ischaemic Stroke.* (a)Cerebral thrombosis. Refers to a thrombus that develops at the clogged part of the vessel. (b) Cerebral embolism. Refers generally to a blood clot in the cerebrovascular system from another location in the circulatory system, usually the heart and large arteries of upper chest and neck, these tend to be associated with atrial fibrillation and other heart diseases. (c)Systemic Hypo-perfusion. This is a general decrease in blood supply for example in shock. (d)Venous thrombosis. This leads to stroke due to locally increased venous pressures which exceeds the pressure generated by the arteries. These infarcts are more likely to undergo haemorrhagic transformation (leaking of blood into the damaged area) than other types of ischaemic stroke. (e) Cryptogenic stroke. This is stroke of unknown origin. Constitutes thirty to forty percent of all ischaemic stroke.[9, 16-19]

Less frequently used though stroke can also be classified based on the Oxford classification into 4 types;(a) Total Anterior Circulation Infarct (TACI). (b) Partial Anterior Circulation Infarct (PACI). (c) Lacunar infarct (LAC). (d) Posterior Circulation Infarct (POCI). These four entities predict the extent of the stroke, the area of the brain affected, the underlying cause and the prognosis.[20, 21]

Haemorrhagic stroke arises from bleeding within the brain parenchyma or intra ventricular spaces. They constitute about fifteen percent of stroke. They result in tissue injury by causing compression of tissue from expanding haematoma or haematomas. This can distort and injure tissues. In addition, the pressure may lead to a loss of blood supply to the affected tissues with resulting infarction, and the blood released by brain haemorrhage appears to have direct toxic effects on brain tissue and vasculature. Inflammation also contributes to the secondary brain injury after haemorrhage [19, 22, 23].

Objectives:
1. To review the socio and clinical demographics of stroke patients.
2. To review specific socio – clinical demographic peculiar to specific types of stroke.

Methods

Data from 120 admitted acute (within twenty-four hours) stroke patients in University of Benin teaching hospital, Nigeria was reviewed. Data was analyzed using SPSS 21 package.

Study area/design: This study was carried in the University of Benin Teaching Hospital (UBTH) which is one of the six first generation hospitals in Nigeria that offers secondary and tertiary care to patients in Edo and neighbouring states.This was a descriptive study that assessed the difference of electrocardiographic abnormalities between diabetic and non-diabetic cases.

Sampling method: A simple non-randomized sampling method was used in selecting patients recruited for this study. One hundred and twenty patients presenting for the first time with clinical features and imaging findings of stroke (CT brain scan was performed in all cases) and were admitted into the UBTH medical wards. They had a detailed history and physical examination finding entered into the data acquisition sheet. ECG was performed on the stroke patients within the first twenty-four hours of presentation.

Inclusion criteria:
A. Patients that have first ever occurrence of stroke.
B. Patients that are eighteen (18) years old and above.

Exclusion criteria:
A. Patients that have two or more occurrence of stroke (recurrent stroke).

B. Patients less than eighteen (18) years of age.
C. Stroke resolved within twenty-four (24) hours, as evidenced by resolution of presenting complaints.
D. HIV positive patient.
E. Patients with malignancies.
F. Patients on immunosuppressive therapy.
G. Patients with electrolyte abnormalities.

Data analysis: Anthropometric measurement and data collected using the preformat were collated and analyzed using the International Business Machines Statistical Product and Service Solutions (IBM- SPSS) version 22. Data were presented using tables and charts. Frequencies and percentages were used to present categorical data while continuous data were expressed as mean (Standard Deviation). Frequencies were compared using the Pearson's Chi-square test while means were compared using the independent t-test. Where the data was skewed, continuous data were expressed as mean (inter-quartile range) and compared using the Mann Whitney U test. Significant chi-square comparisons were further tested using a binomial logistic regression where applicable. A p value less than 0.05 were considered significant for all statistical comparisons.

Ethical clearance: Ethical clearance was obtained from the Research and Ethics Committee of the University of Benin Teaching Hospital, Benin City, Edo State.Informed consent was obtained from patients before participation in the study.Autonomy: Respect for respondents and confidentiality was maintained.Throughout the process of extracting the data.

RESULTS

Table showing socio-clinical demographics of acute stroke cases

ITEM		
	N	%
MEAN AGE IN YEARS	58.5	
SEX MALE	56	46.7
FEMALE	64	53.3
RESPIRATORY DISTRESS	100	83.3
FACIAL PALSY	68	56.7
IMPAIRED SPEECH	64	53.3
HEADACHE	32	26.7
LOSS OF CONSCIOUSNESS	28	2 3.3
VOMITING	28	23.3
FEVER	12	10.0
PALOUR	12	10.0
SEIZURES	4	3.3
HYPERTENSION	92	76.7
DIABETES MELLITUS	28	23.3
OBESITY	12	10.0

The mean age of the stroke patients was 58.47 +/- 12.80 years. One hundred (83.3%) of the stroke patients were married, twelve (10%) were single and eight (6.7 %) were widowed. All the stroke patients were Christians. Among the stroke patients, forty-eight (40%) were Binis, twenty-four (20%) were Urhobos, sixteen (13.3%) were Igbos and eight (6.7%) were Esan.

Twelve (10.0%) stroke patients had fever. Thirty-two (26.7%) of stroke patients had headache. Sixty-four (53.3%) of the stroke patients had impaired speech. Loss of consciousness was in twenty-eight (23.3%) of the stroke patients Among the stroke cases, sixteen (40.0%) of the forty haemorrhagic stroke cases and twelve ` (15.0%) of the eighty ischaemic stroke cases presented with loss of consciousness. This difference was statistically significant, p = 0.019 OR = 2.67, CI 1.15 – 6.17. Of the stroke patients, four (3.3%) had seizures, twenty-four (20.0%) of the stroke patients presented with vomiting, forty (33.3%) of the stroke patients had the stroke during activity,

Sixty-eight (56.7%) of the stroke patients had facial nerve paralysis, ninety-six (80.0%) of the stroke patients were ill-looking at presentation. Twelve (10.0%) of the patients had pallor on presentation and all were ischaemic stroke cases. Twenty (16.7%) and one hundred (83.3%) of the stroke patients had respiratory rate of less than twenty and greater than twenty respectively. This difference was significant, p <0.001 Ninety-two (76.7%) of the stroke patients were known hypertensive. Forty-four (47.8%), thirty-two (34.8%) and sixteen (17.4%) were known hypertensives of less than five years, six to ten years and greater than ten years respectively. Stroke was significantly more in cases less than ten years, seventy-six (82.6%) vs sixteen (17.4%), p < 0.001 Twelve (10.0%) of the stroke patients were obese.

Eighty (67.7%) and forty (33.3%) of stroke enrolled were Ischaemic and Haemorrhagic respectively. The difference was statistically significant with p = 0.003 Sixty-four (53.3%) had left hemispheric stroke and fifty-six (46.7%) had right hemispheric stroke. There was no statistical significance with p = 0.551

Discussion

The mean age of the stroke cases was the middle age group which is the productive age of the economy; hence no surprise that stroke is a major economic burden. Haemorrhagic stroke was more common in the younger age group than ischaemic counterpart. However ischaemic stroke was significantly more in males than haemorrhagic. Loss of consciousness was associated with haemorrhagic stroke and all cases with palour were ischaemic stroke patients. Stroke cases are usually ill looking, in respiratory distress, no wonder that this disorder is a medical emergency.On multivariate analysis differences exist between haemorrhagic and ischaemic stroke in this study. History of young age, fever, headache, loss of consciousness, vomiting and right cerebral stroke were predictors of haemorrhagic stroke. Ischaemic stroke cases had only facial nerve palsy and left cerebral stroke as predictors. Differences also exist between left and right cerebral strokes in this study. Age less than sixty-five years old, male sex, headache and haemorrhagic stroke were predictors of right cerebral stroke. Female sex and ischaemic stroke were predictors of left cerebral stroke.The most common risk factor for stroke in this study was hypertension. Stroke occurred more in cases that are of less than ten years as known hypertensive than greater. Are we in the midst of an epidemiologic shift where stroke seem to occur in younger age group and shorter duration of risk factors like hypertension.

Conclusion

Stroke affected mainly the middle age group in this study. Socio- clinical differences exist between left and right stroke and types of stroke(ischaemic and haemorrhagic) in this study.These differences should be further studied to see if this can be used to some degree of certainty predict the cerebral side and or types of stroke case

Recommendation: There is need to do similar studies using multicenter, larger number of patients and for longer duration to look at these differences.

Limitations of this study: This is a single center study thus the sample size though adequate can be improved upon. A larger sample size would involve a large multicenter study which will take more time and resources beyond that available for this research.

References

1. World Health Organization. Cerebrovascular Disorder Geneva: World Health Organization.1978.24-6
2. Boutayeb A and Boutayeb S. The burden of non-communicable disease in developing countries. Int. J. Equity Health. 2005; 4: 2-6.
3. Ellekjaer H, Holmen J, Indredavik B, et al. Epidemiology of stroke in Innherred, Norway, 1994 to 1996: Incidence and a 30 – Day case fatality rate.Stroke .1997; 28: 2180 -2184.
4. Kocan M J. Cerebrovascular effects of acute stroke. Prog Cardiovascular Nurs.1999; 1:61—7.
5. Goldstein D S. The electrocardiogram in stroke: relationship to pathophysiological type and comparism with prior tracings. Stroke. 1979; 10: 253-9.
6. Familoni O.B. The pattern and prognostic features of QT intervals and dispersion in patients with acute ischaemic stroke. J Natl Med. Assoc. 2006; 98: 1758-62.
7. Tokgozoglu S.L, Batur M.K, Topcuoglu M.A, et al. Effects of Stroke localization on Cardiac Autonomic Balance and Sudden Death. Stroke. 1999; 30:1307-11.
8. World Health Organization. The World Health Report 2004. Annex Table 2: Deaths by cause, sex and mortality stratum in WHO regions, estimates 2002.Geneva. World Health Organization.2004.
9. Donnan G A, fisher M, Macleod M, et al. Stroke. Lancet. 2008; 371: 1612 -15.
10. Go A.S, Mozaffarian D, Roger V .L et al. Heart and stroke statistics 2013update report from the American Heart Association. Circulation. 2013; 2: 241-6.
11. WHO. The top 10 causes of death. Geneva. World Health Organization. 2017.   Available from www.who.int/en/news-room/factsheets/detail/the-top-10-causes-of-death (Accessed on 16th May 2018).
12. Senelick R, Rossi C, Peter W, et al.Living with stroke: A Guide for facilities. Chicago. Contemporary books. 1994.10-6
13. Coffey C, Edward C. Jeffery L, et al. Stroke .The American psychiatric press textbook of Geriatric Neuropsychiatry . Washington DC: American Psychiatric press.2000.2 edition. 601 – 617.
14. Lisa D. Sandra E. Fuqiand G et al. Correlating lesion size and location to deficits after ischaemic stroke the influence of accounting for altered peri-necrotic tissue and incidental silent infarcts. Behav Brain Funct. 2010; 6: 6-10.
    Available at http:www.ncbi.nlm.nih.gov/pmc/articles/PMC2823642
    Accessed 12th September, 2019
15. Reith J, Jorgensen H. S, Hakayama H. et al. Seizures in acute stroke: predictors and prognostic significance. The Copenhagen stroke study.1997; 28: 1585-9.
16. Ocarroll C.B, and Barrette K.M. Cardioembolic Stroke.Continuum Lifelong Learning in Neurology.2017; 23:111-132.
17. Shuaib A, Hachinski V. C, "Mechanisms and management of stroke in the elderly". CMAJ. 1991; 145: 433 - 43.
18. Stam J. "Thrombosis of the cerebral veins and sinusis." The New England Journal of Medicine. 2005; 352:1791 – 8.
19. National Institute of Neurological Disorders and Stroke (NINDS).'Stroke Hope Through Research'. National Institute of Health.1999.112-5
20. Bamford J. Classification and natural history of clinically identifiable subtypes of cerebral infarction. Lancet.1991; 337:1521 – 6.
21. Bamford J. M. 'The role of the clinical examination in the subclassification of stroke'. Cerebrovas. Dis.2000; 10:2 – 4
22. Wang J. 'Preclinical and clinical research on inflammation after intracerebral haemorrhage'. Prog. Neurobiol. 2010; 92: 463–77.
23. Adeloye D. An estimate of the prevalence of hypertension in Nigeria: a systematic review and meta-analysis. J. Hypertension. 2015; 2: 260 – 262.