

Improving Stroke Management through Specialized Stroke Units in Nigeria: A situational Review

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ABSTRACT

Background: Stroke therapy is aimed at re-opening blocked arteries and increasing the survival of cells that are injured in addition to the early rehabilitation of the stroke patient. The establishment of stroke units has been found to improve the survival of patients and significantly reduce disability by rendering holistic care. Early intervention to rapidly restore and maintain blood supply to the ischemic area in the brain, minimize brain damage and hence impairment as well as disability and secondary complications which will reduce the risk of death is more likely achievable in specialized care settings. The objective of this review is to discuss the role and feasibility of implementing stroke care in specialized stroke units (SSUs).

Methods: Key literature detailing the care of stroke patients at the different tier of health institutions in Nigeria and abroad were reviewed using Medline and Google search utilizing the following keywords' Stroke unit; Management; Shared Burden and Nigeria. The difficulties associated with the provision of care for stroke patients in specialized stroke units were identified while the implications and suggestions for the development of such units in Nigeria are addressed.

Results: The care of stroke patients remains mainly uncoordinated and usually managed in the general medical wards with suboptimal management. Issues that may affect establishment of specialized Stroke Unit include lack of Neurologists, Geriatricians with special interest in stroke management, allied health professionals and Nurses trained in providing supportive care. The challenges of the start –up cost, and public education in seeking help early enough are also highlighted.

Conclusion: The evidence for the need for change from the usual care of stroke patient's in general medical wards to specialized stroke units is undisputable. Establishment of such units in Nigeria is desirable, urgent and feasible. The establishment of these SSUs can be started by having specific designated beds in a section of the medical wards with the care assigned to specially trained medical and allied health providers.

Key Words: Sharing; burden; stroke unit; Nigeria.

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INTRODUCTION

Stroke as defined by the World Health Organization (WHO) is a syndrome of rapidly developing clinical symptoms and signs of focal (or global) loss of cerebral function with symptoms lasting 24 hours or more with no apparent cause other than vascular.

It is the second commonest cause of death worldwide and the third commonest cause of mortality in developed countries. Stroke caused estimated 5.7 million deaths worldwide in 2005; with 87% of these deaths in low income and middle income countries. Without intervention, the number of global deaths from stroke is projected to rise to 6.5 and 7.8 million by 2015 and 2030 respectively.

Stroke is a major cause of long term disability and has potential enormous emotional and socioeconomic burden for patients, their families and health services. In Nigeria, its impact on our economy and financial burden on care givers has not been definitely estimated as no actual publications or statements exists in this regard

The actual incidence and prevalence of stroke have not been established in Nigeria. Most studies done so far are hospital based and hence may just be the tip of the iceberg. Osuntokun et al reported a crude incidence of stroke among Nigerians in Ibadan of 58/ 100,000 between 1973 - 1975 and most recently Danesi et al in a mixed income urban population in Lagos reported an incidence of 114/100,000.

Stroke is the leading cause of neurological admissions in most tertiary hospitals in Nigeria surpassing central nervous system infections¹¹. It accounts for 0.92-4% of hospital admissions and 2.83-4.52% of total deaths in Nigeria.

The average age of stroke onset in Nigeria is 61 years (12% below age 40 with unknown etiology), resulting in loss of a greater number of productive years of life.

Overview of the management of stroke patients in Nigeria

Stroke patients are admitted mostly through the accident and emergency departments and medical outpatient clinics and subsequently transferred to the medical wards. Patients are classified on clinical grounds into ischaemic or haemorrhagic strokes using the world Health Organization (WHO) criteria. Computed tomographic scan is the gold standard and cornerstone in the diagnosis of stroke types. Though now readily available in most tertiary centers, the major limitations to its ready use include high cost. On the average a brain CT scan costs about \$ 250 - \$380 USD (N40, 000-N60, 000) in Nigeria. Patients also present later than in

developed countries adding to the delay in the utilization of Brain CT Scan. Clinical assessment therefore plays a major role in classifying the type of stroke.

Cerebral ischaemia is suspected if there is an acute onset of fixed neurological deficit with or without impairment of consciousness, which may have been preceded by a transient ischemic attack, occurring at rest or with normal or mild elevation of the blood pressure with no associated headache or vomiting. Patients with clinical diagnosis of ischemic stroke are commenced on soluble aspirin as recombinant tissue plasminogen activator (RT-PA) is not available for use in most developing countries including Nigeria. Patients, who present much later than the 3hour window of opportunity, are maintained on isotonic or hypertonic fluid, and antihypertensive if indicated. Intravenous 20% mannitol is given in boluses for up to 3 days if there is clinical evidence of cerebral oedema. Physiotherapy is usually commenced within one week. Fever, if present is carefully monitored evaluated and treated with antipyretics, antibiotics or anti-malarials if confirmed. A blood glucose equal to or above 10mmol/l or 200mg/dl is treated with subcutaneous insulin. Unless blood sugar is known, no carbohydrate fluid is given to an acute stroke patient.

Intracerebral haemorrhage is assumed to have occurred if the episode is associated with a rapidly changing neurological deficit and impairment of consciousness. There may be associated vomiting and headache, moderate or severe elevation of the blood pressure and the cerebrospinal fluid may be bloody. A history of previous transient ischaemic attack is uncommon.

The management of intracerebral hemorrhage is usually individualized according to patient's age, blood pressure and presence of other co-morbidity factors like diabetes mellitus and hyper-cholesterolaemia. Principles of management includes maintenance of air way, adequate oxygenation, graded reduction of blood pressure, osmotherapy for medical reduction of elevated intracranial pressure and treatment of associated seizures. Other supportive measures include maintaining adequate fluid and electrolyte balance, parenteral nutrition and prevention of constipation by using stool softeners.

The case for shared stroke care

There are fewer than 100 neurologists to care for a population estimated to be over 150 million, a ratio of 1:1.5 million. The burden on neurologists is therefore enormous. It is therefore important to improve services for the care of patients with risk factors that could cause stroke such as hypertension, diabetes mellitus, heart disease and peripheral vascular disease as these would lessen the enormous burden on the meager number of neurologists if these patients eventually develop a stroke.

Shared care schemes published in the literature center mainly on diseases such as asthma and diabetes mellitus. Such schemes have been well established in developed countries, such as the United Kingdom (U.K), where stroke units and acute stroke care services are well established.

It is well known that stroke patients, during the first few days after the ictus, are at increased risk of complications such as cerebral oedema, brain herniation, hypertension, pyrexia, aspiration pneumonia, deep vein thrombosis, pulmonary embolism, hyperglycemia, incontinence, urinary tract infection, cardiac arrhythmias, depression and pressure sores. However some of these problems are preventable. Aspiration maybe reduced by tube feeding and gastrostomy if patients have dysphagia while venous thromboembolism maybe reduced by using compression stockings. As stroke patients are in competition for time and resource with other acute medical patients on the general medical wards many of these patients receive suboptimal management.

Stroke units

A stroke unit is defined as the provision of coordinated multidisciplinary care usually provided within a geographically discreet area such as a stroke ward. The term organized stroke care is used to describe a broad definition of care in the hospital that is provided by a multidisciplinary team with a specialist interest in stroke care. This involves medical, nursing, physiotherapy, speech therapy and occupational therapy specialist whose work is coordinated through regular meetings. The stroke units were established to improve the management of patients with stroke during the acute phase. The Stroke Unit Trialist Collaboration carried out a systematic review of 19 major stroke units (involving 3249 patients) for stroke care. They found out that such care was associated with long term reduction in death and disability by rendering holistic care. The evidence for reducing mortality and disability and hospital stay in dedicated specialized stroke units is overwhelming. Organized stroke care improves outcome regardless of age, sex or stroke severity. These units also cater for the education of staff, patients and their caregivers.

Shared care for stroke patients in Nigeria will be an effective way of managing patients at high risk of stroke in the community. It requires motivation and cooperation between primary, secondary and tertiary care health providers and patients and their caregivers.

In primary care, such patients should have early investigation such as blood sugar to detect Diabetes mellitus; genotyping for sickle cell disease in children and blood pressure measurement for hypertension. Health promotion leaflets and posters may aid awareness and encourage patients to change their lifestyle which may help reduce risk factors and encourage patients to seek help early.

At the secondary care level, investigations, such as electrocardiogram (ECG) could help detect patient with cardiac arrhythmias especially atrial fibrillation (AF).

Stroke Intensive Care Units (SITU) should mainly be at the tertiary health care level. Such units will manage patients aggressively with the use of elective ventilation and thrombolysis as appropriate. Such care in SITUs was associated with reduced rate of complications, including thrombo-embolism, pneumonia, urinary tract infection and pressure sores. Aggressive interventional treatment and early supportive management within acute stroke units (ASUs),

usually need such facilities as computerized tomography scan (CT Scan), magnetic resonance imaging (MRI,) and carotid Doppler or ultrasound which could help detect ipsilateral carotid stenosis). SITUs and ASUs should have tight management protocols which should be followed to ensure high quality medical, nursing and therapeutic care. The objective is to reduce morbidity complications and length of stay in hospital and also have improved secondary prevention such as commencing use of Aspirin and control of hypertension.

In addition earlier involvement of therapists for rehabilitations and treatment of stroke will be better coordinated in such units.

Running a Stroke Unit (SU)

The (SU) should aim to merge acute medical and intermediate rehabilitation phases. This will make it easier for the stroke patients to be followed through to the stroke rehabilitation unit (SRU) and discharge. Staff would rotate between the acute and rehabilitation units thereby learning and understanding the role of each other.

Criteria for admission into the SU, should clearly state which patients should be admitted. Such consideration may include, age and severity of the stroke, length of stay, number of available for admission, rehabilitation beds and policies on direct discharge home.

The relevant Investigations to be carried out such as CT (Computerized tomography) scanning, carotid Doppler and electrocardiogram (ECG) should also be outlined. The measures to prevent complications should be clearly outlined. These include measure such as swallowing assessment to prevent aspiration and the use of compression stockings or subcutaneous heparin for prophylaxis of thrombo-embolism. The protocols on secondary preventions including instituting aspirin or warfarin, carotid endarterectomy and lipid lowering and blood pressure control should be applied as appropriate. The availability of nursing care and allied health professional support should also be addressed.

Interdisciplinary ward rounds and regular meetings are necessary. The team should be lead by a lead clinician preferably a Neurologist, but a Geriatrician or physician with special interest and experience with stroke management could also serve.

The stroke unit could be set up as a designated number of beds within an acute general medical ward or a separate unit preferably in the ground floor close to the occupational and physiotherapist department. This would make it much easier for the rehabilitation of the patients.

The management of stroke patients should also be addressed in the National Health Insurance Scheme (NHIS). Its operational budget should be separate from that of Internal Medicine Departments in secondary and tertiary centers as cost of such patients is usually higher than the average acute medical admission and rehabilitation usually more prolonged.

Possible impediments to establishment of stroke units in Nigeria.

Cost: The perceived cost of providing such specialized unit care maybe an impediment: The National Health Insurance scheme seems to have grouped all medical conditions into one. Stroke patient management should be funded separately. A revolving fund should be set aside to run such units. It is unclear how much care of each patient will cost. Data on such information seem to be unavailable currently.

Public perception of stroke as an ailment: Every ethnic group has a culture and tradition that may impact on their perception and understanding of an ailment. Stroke has been interpreted as a sign of the “gods” or “spirits” being angry and has struck the person in anger, causing paralysis” to “the neighbor has poisoned him”, “,his bad deeds have caught up with him” (remark from relatives and friends of stroke patients). Public education on the risk factors associated with stroke will help diffuse such perception and hopefully increase patients being brought in for early intervention.

Poor Education and Poverty amongst the population:

People in the lower socioeconomic group are at increased risk of stroke,. The uptake of orthodox health care is also lower as their level of education, knowledge, awareness and acceptance of available information and services are poor. Education has a function to play in causing disease. An educated person appreciates positive information that has implication on his health, such as life changes involving eating habits, uptake of exercise, stopping smoking and reducing stress levels. Delivery of health knowledge and information to the high risk may increase the uptake of the stroke services. Poverty contributes to non-compliance in the treatment of known factors such as hypertension, diabetes mellitus and hypercholesterolaemia as the drugs are fairly expensive and most patients cannot afford the huge costs associated with continuous long term treatment.

Poor Provision of Healthcare Staff, Equipments and Infrastructure:

A successful stroke unit should have the necessary medical and allied health professionals to ensure continuing care of the patients. The nursing and physiotherapist requirements for such patients are usually more than that for the average patient in the general medical ward. Equipments and infrastructures including the quick access to radiological investigations such as CT and MRI scanners, available bed spaces either in a section of the general medical ward or as an independent unit could all hinder such services. Facilities and manpower for emergent neurosurgical interventions where indicated should be in place

SUMMARY AND CONCLUSION

The need for specialized care of the stroke patients is overwhelming. The current practice of caring for the stroke patients in the general medical ward does not provide adequate care of such patients. Data on shared care for management of stroke patients in Nigeria appears scanty. The shared care of stroke patients had helped to decrease the long term morbidity and mortality in stroke patients in the developed world and seem to be the way forward to achieving same goals in our own population. Though there are

anticipated and inevitable impediments to setting up and running stroke units in Nigeria efforts should be made to coordinate the management of such patients. Shared care for the management of stroke patients need to be addressed and implemented in Nigeria.

REFERENCES

- Hatano S. Experience from a multicenter stroke register: a preliminary report. *Bull World Health Organisation* 1976;54:541-553
- Sarti C, Bastenye D, Cepaitis J, Tuomilehto J. International trends in mortality from stroke, 1968-1994. *Stroke* 2000;31:1588-1601
- Strong K, Mathers C, Bonita R. Preventing stroke, saving lives around the world.
- Lancet Neurol* 2007;6;2:182-187
- Foulkes MA, Wolfe PA, Price TR, Mohr JP, Hier DB. The stroke data bank: design, methods and baseline characteristics. *Stroke* 1998;19:547-554
- Ogungbo BO, Ogun SA, Ushewokunze S, Mendilow AD, Walker R, Rodgers H. How can we improve the management of Stroke in Nigeria, Africa. *Afr J Neurol Sc*, 2005, 24;2:9-19
- Osuntokun BO, Bademosi O, Akinkhugbe OO, Oyediran AB, Carlisle R. Incidence of Stroke in an African city: results from the Stroke Registry at Ibadan, Nigeria, 1973-1975
- Danesi M, Okubadejo N, Ojini F. Incidence of Stroke in an urban mixed income community in Lagos, Nigeria. *Neuroepidemiology* 2007;28:216-223
- Ogun SA, Adelowo OO, Familoni OB, Jaiyesimi AEA, Fakoya EAO. Pattern and outcome of Medical admissions at the Ogun State University Teaching Hospital, Sagamu: a three year review. *Afr J Med* 2000; 19:304-308
- Odusote A. Management of Stroke. *Nig Med Pract* 1996, 32(5/6):54-62
- Ojini F, Ogun SA, Danesi M. 30 days case fatality of Stroke at the Lagos University Teaching Hospital, Lagos, Nigeria. *Nig Quart J Hosp Med* 2004;14:64-66
- Onwuchekwa AC, Asekomeh EG, Iyagba AM, Onung SO. Medical mortality in the Accident and Emergency Unit of the University of Port Harcourt Teaching Hospital. *Nig J Med* 2008, 17;2:184-187
- Ogun SA, Oluwole O, Falade B, Ogunseyinde AO, Ojini FI, Odusote KA. Comparison Siriraj Stroke Score and the WHO criteria in the clinical classification of stroke subtypes. *Afri J Med Sc* 2002, 3;1:3-6
- Muir KW, Santosh C. Imaging of Acute ischaemic stroke and transient ischaemic attack. *J Neurol Neurosurg Psychiatry* 2005;76(suppl III):iii19-iii28
- Van der Worp HB, van Gijn J. Acute Ischaemic Stroke. *N Engl J Med* 2007;357:572-579
- Pandian JD, Padma V, Vijaya P, Sylaja PN, Murthy JMK. Stroke thrombolysis in developing countries. *Int J Stroke* 2007;2:17-26
- Goldstein LB. Acute Ischaemic Stroke Treatment in 2007. *Circulation* 2007;116:1504-1514
- Hacke W, Kaste UM, Olsen TS, Bogousslavsky J, Orgogozo JM. Acute treatment of Ischaemic Stroke. *Cerebrovasc Dis* 2000;10(suppl3):22-33
- Qureshi AI, Tuhim S, Broderick JP, Batjer HH, Hondo H, Hanley DF. Spontaneous Intracerebral Haemorrhage. *N Engl J Med* 2001, 344;19:1450-1460
- Broderick J, Comolli S, Feldman E, Hanley D, Kase C, Krieger D, Mayberg M et al. Guidelines for the management of spontaneous intracerebral haemorrhage. *Stroke* 2007;38:2001-2023
- Williams UE. Neurological letter from Calabar, Nigeria. *Pract Neurol* 2009;9:237-239
- Owolabi MO, James HB, Ogunniyi A. Mapping Africa's way into prominence in the field of Neurology. *Arch Neurol* 2007;67:1696-1700
- Smith SM, Albright S, O'Dowd T. Effectiveness of shared care across the interface between primary and specialty care in chronic disease management. *Cochrane Database of Systematic Reviews* 2007, Issue 3. Art No: CD004910
- Sulchi D, Evans A, Melbourn A, Kalra A. Does an integrated care pathway improve processes of care in stroke rehabilitation? A randomized controlled trial. *Age and Ageing* 2002; 31:175-179
- Kumar S, Selim MH, Caplan LR. Medical Complications after Stroke. *Lancet Neurol* 2010, 9;1:105-118
- Langhorne P. Organisation of Acute Stroke Care. *British Med Bull* 2000, 56;2:436-443
- Carraway WM. Stroke rehabilitation units: concepts, evaluation and unresolved issues. *Stroke* 1995;16:178-181
- Stroke Unit Trialist Collaboration. Collaborative systematic review of the randomized trials of (organized stroke unit) care after stroke. *British Med J* 1997;314:1151-1159
- Langhorne P, Williams BO, Gilchrist W, Howie K. Do stroke units save lives? *Lancet* 1993;342:395-8
- Rodgers H, Dennis M, Cohen D, Rod I. British Association of Stroke Physicians: Benchmarking Survey of Stroke Services. *Age and Ageing* 2003;32:211-217
- Langhorne P, Pollock A in conjunction with the Stroke Unit Trialist Collaborators. What are the components of effective stroke unit care? *Age and Ageing* 2002;31:365-371
- Millikan CH. Stroke intensive care units: objectives and results. *Stroke* 1979, 10;3:235-236
- Pitner SE, Mance CJ. An Evaluation of Stroke Intensive Care: Results in a municipal Hospital. *Stroke* 1973, 4:737-741
- Kjellstrom T, Norrving B, Shatchkute. Helsingborg 2006 Declaration on European Stroke Strategies. *Cerebrovasc Dis* 2007;23:229-241
- Caplan LR. Stroke is best managed by Neurologists. *Stroke* 2003, 34:2763
- Owolabi MO. Psychometric Properties of the HRQLISP-40: A Novel, Shortened Multiculturally Valid Holistic Stroke Measure. *Neurorehabil Neural Repair* 2010, 24:814-825
- Cox AM, McKeivitt C, Rudi AG, Wolfe CD. Socioeconomic status and stroke. *Lancet Neurol* 2006;5:181-188