

Letter: The State of Cerebrovascular Care in Africa

To the Editor:

Cerebrovascular diseases (CVDs) refer to a subset of medical conditions that affect cerebral circulation, such as stroke, carotid stenosis, intracranial stenosis, aneurysms, vascular malformations, and carotid stenosis. CVDs necessitate careful monitoring to reduce incidence and improve treatment outcomes as failure to do so could result in potentially permanent deficits. However, unlike in high-income countries where stroke mortality rates have decreased, the incidence of stroke in developing countries has increased in recent years and is expected to continue rising.¹ Furthermore, recent trends indicate that sub-Saharan Africa has the highest number of strokes in the world, with age-standardized incidence rates of up to 316 per 100 000 and prevalence rates of up to 14 per 1000 population; up to 40% fatality rates are found to occur in the first month alone.²

The epidemiology, management, and prognosis of other CVDs such as cerebral aneurysms, subarachnoid hemorrhage, cerebral venous thrombosis, and others are poorly understood and are also seldom reported in Africa.^{3,4} To date, most of the data have been gleaned from modeling studies. The paucity of data raises questions about the epidemiology and management of CVDs in Africa. For instance, a study into cerebral aneurysm failed to highlight aneurysmal location which is an important aspect when choosing a treatment procedure or modality.³ Furthermore, only 11 of 54 African countries have reported on cerebral aneurysms.³

The rapid advancement in research in acute stroke care in Africa indicates that the evidence-to-practice disparity in acute stroke care is fluctuating.⁵ Studies show that the prevalence of stroke in Africa is rising among young people, owing to uncontrolled risk factors with hemorrhagic stroke being more common with a 34% incidence compared with 9% in developed countries.^{6,7} Furthermore, stroke accounts for 65% of adult neurological admissions in West Africa.⁸ According to hospital data collected for the INTERSTROKE study, the case fatality rate for stroke in the African region is 22%, compared with less than 4% in developed countries. Cerebral small vessel disease, which causes vascular malformation and stroke, is 30% more prevalent in African countries than the rest of the world.⁹ Despite over two-thirds of stroke deaths worldwide, there have been few demographic studies of stroke in developing countries.² Low quality studies, underestimation of the number of strokes, and underrepresenting the masses of the people living in developing countries are some limitations these studies have. Low quality studies are characterized by abstruse findings and a higher possibility of bias. Underestimation of the number of strokes in developing countries is due to the potential referral bias in hospital-based studies, insufficient data in retrospective studies, and lack of representativeness in studies.² For example, when 12 studies were conducted

in Kenya, only 1 study was conducted in a rural setting although two-thirds of the population of Kenya live in the rural areas.⁶ Even when studies are conducted on stroke, they refuse to cover the aspects of stroke care such as hyperacute, inpatient and rehabilitation care, secondary prevention, and functional, neuro-cognitive and psychiatric predictions.⁶

Although there have been significant advances in diagnostics and management of CVDs, Africa still has significant evidence and practice gaps. For instance, thrombolysis and mechanical thrombectomy are common treatment for acute ischemic stroke, but they are not accessible in all African nations because of restricted availability, high prices, and long wait times.¹⁰⁻¹² There are only 30 stroke units in Africa, yet most of them are concentrated in South Africa alone.¹³ Another example, subarachnoid hemorrhage as a complication of cerebral aneurysm, is frequently misdiagnosed because of a lack of neuroimaging and frequently goes untreated because of a lack of access to vascular neurosurgeons and even neurosurgical facilities.³ The scarcity of African cerebrovascular surgery data is also a cause for concern because this field of medicine has the potential to broaden the treatment repertoire for severe CVDs. The lack of data stifles the potential benefits that patients may obtain, limiting future advances, because of a lack of understanding of its usage, efficacy, and reach. These gaps must be filled if patient care can be improved in the future.

In general, CVD care in Africa remains subpar, with improvements needed to better serve their population. One potential avenue for improvement is the creation and implementation of efficient systems and models of care that require fewer resources. These models should include systems for preventing and controlling strokes and other CVDs, as well as ensuring efficiency in management. Further prospective studies are required to uncover the reason for the absence of CVDs research in developing nations to combat the lack of data on the epidemiology, management, and burden of CVDs in Africa. More sophisticated research is needed to gain a better understanding of the causes of CVDs and their global prevalence and to identify the causes of disparities and changes in CVDs patterns, particularly between nations of different economic levels. Furthermore, existing modern hospitals with appropriate facilities and stroke/CVD centers must be established with the goal of improving CVD management, and they should be equipped with modern diagnostic instruments. The establishment of research institutions to study CVDs on the African continent should be prioritized by international communities and African governments. Most importantly, increased educational expenditures for experts and other health care professionals are required to address the continent's health care labor shortage.

Funding

This study received no funding or financial support.

Disclosures

The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

Pearl Ohenewaa Tenkorang, MBChB^{‡*}

Wireko Andrew Awuah, MBBS^{§*}

Jyi Cheng Ng, MD^{||}

Jacob Kalmanovich, BS[‡]

Abubakar Nazir, MBBS[#]

Rohan Yarlagadda, BS^{}**

Toufik Abdul-Rahman, MBBS[§]

Arda Isik, MD^{††}

[‡]Faculty of Medicine, University of Ghana Medical School, Accra, Ghana

[§]Faculty of Medicine, Sumy State University, Sumy, Ukraine

^{||}Faculty of Medicine and Health Sciences, University of Putra Malaysia, Serdang, Malaysia

[‡]Faculty of Medicine, Drexel University College of Medicine, Philadelphia, Pennsylvania, USA

[#]Faculty of Medicine, King Edward Medical University, Pakistan

^{**}Faculty of Medicine, University School of Osteopathic Medicine, Stratford, New Jersey, USA

^{††}Istanbul Medeniyet University, Department of General Surgery, Istanbul, Turkey

*Pearl Ohenewaa Tenkorang and Wireko Andrew Awuah contributed equally to this work.

REFERENCES

1. Urimubenshi G, Cadilhac DA, Kagwiza JN, Wu O, Langhorne P. Stroke care in Africa: a systematic review of the literature. *Int J Stroke*. 2018;13(8):797-805.

2. Sarfo FS, Ovbiagele B, Gebregziabher M, et al. Stroke among young West Africans: evidence from the SIREN (Stroke Investigative Research and Educational Network) large multisite case-control study. *Stroke*. 2018;49(5):1116-1122.
3. Tetinou F, Kanmounye US, Sadler S, et al. Cerebral aneurysms in Africa: a scoping review. *Interdiscip Neurosurg*. 2021;26:101291.
4. Baduro Y, Ferro JM. Cerebral venous thrombosis in sub-Saharan Africa: a systematic review. *J Stroke Cerebrovasc Dis*. 2021;30(6):105712.
5. Baatiema L, Chan CKY, Sav A, Somerset S. Interventions for acute stroke management in Africa: a systematic review of the evidence. *Syst Rev*. 2017;6(1):213.
6. Waweru P, Gatimu SM. Stroke epidemiology, care, and outcomes in Kenya: a scoping review. *Front Neurol*. 2021;12:785607.
7. O'Donnell MJ, Xavier D, Liu L, et al. Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the INTERSTROKE study): a case-control study. *Lancet*. 2010;376(9735):112-123.
8. Owolabi MO, Akarolo-Anthony S, Akinyemi R, et al. The burden of stroke in Africa: a glance at the present and a glimpse into the future. *Cardiovasc J Afr*. 2015;26(2 suppl 1):S27-S38.
9. Akinyemi RO, Owolabi MO, Ihara M, et al. Stroke, cerebrovascular diseases and vascular cognitive impairment in Africa. *Brain Res Bull*. 2019;145:97-108.
10. Akinyemi RO, Ovbiagele B, Adeniji OA, et al. Stroke in Africa: profile, progress, prospects and priorities. *Nat Rev Neurol*. 2021;17(10):634-656.
11. Alejo G, Otite O, Maldonado-Soto A, et al. Mechanical thrombectomy (MT) for stroke access in Africa: a Global MT 2020+ campaign survey. *J Stroke Cerebrovasc Dis*. 2022;31(4):106373.
12. Chang P, Prabhakaran S. Recent advances in the management of acute ischemic stroke. *F1000Res*. 2017;6:F1000.
13. Uwishema O, Berjaoui C, Correia IFS, et al. Current management of acute ischemic stroke in Africa: a review of the literature. *Eur J Neurol*. 2022;29(11):3460-3465.

© Congress of Neurological Surgeons 2023. All rights reserved.

10.1227/neu.0000000000002330