

Ischemic and Hemorrhagic Stroke in Bahir Dar, Ethiopia: A Retrospective Hospital-Based Study

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Introduction: The epidemiology of stroke in sub-Saharan countries is poorly characterized because of lack of population-based studies and national vital statistics systems with complete death registration. *Objective:* To describe risk factors, clinical presentations, the pattern of brain insult, and outcomes of stroke patients admitted to a hospital in Ethiopia. *Method:* A retrospective hospital-based study was conducted on 508 patients, 303 of whom had computed tomography proven stroke, who were admitted to medical wards of Felege Hiwot Referral Hospital, Bahir Dar Ethiopia, from February 2014 to August 2016. *Results:* From 508 patients with a clinical diagnosis of stroke, 303 patients had computed tomography and complete medical record. Of the latter, 63% were male and 32% were in the age group 61-70 years. The most common initial clinical presentation was hemiplegia (61%). Common risk factors documented with stroke were hypertension (36.3%), dyslipidemia (20.4%), atrial fibrillation (12.2%), and structural cardiac disease (9.2%). Ischemic stroke comprised 59.4%, whereas 40.6% were hemorrhagic stroke. Only 3.6% patients arrived at the hospital within 3 hours of onset of clinical symptoms. Among subjects with preexisting treated hypertension, 56% had discontinued antihypertensive medications. One third of patients with atrial fibrillation were on warfarin or aspirin. In-hospital mortality rate was 11%. The cerebral cortex was affected in 36.6%. *Conclusion:* Poor adherence to drugs and uncontrolled high blood pressure might have resulted in a high proportion of hemorrhagic stroke. Use of anticoagulants for atrial fibrillation should be standard in patient with risk factors for stroke in Ethiopia **Key Words:** Ischemic stroke—hemorrhagic stroke—Bahir Dar—Ethiopia.

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The data that support the findings of this study are available from the corresponding author upon request.

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Introduction

In sub-Saharan Africa, the incidence of stroke, especially hemorrhagic stroke, may have risen substantially over the last 20 years as have other noncommunicable diseases.¹ This epidemiologic transition is postulated to be due to a combination of adoption of Western lifestyle, dietary changes, urbanization, and demographic transition with increasing life expectancy and population growth.^{2,3} Globally, 15 million people suffer stroke each year. Of these, 5 million die and another 5 million are left permanently disabled, placing a burden on family and community.⁴ Stroke is also the second most common cause of death⁵ and the third most common cause of disability-adjusted life-years worldwide.⁶

In 1990, a study from Ethiopia reported a crude prevalence of stroke survivors 15 per 100,000 population.⁷ In the same period, the estimated years of life lost in thousands from the global burden of disease study was 483. This number has increased by 31% to 642 in 2010.⁸ Moreover, stroke is reported to be one of the important causes of morbidity and mortality from hospital-based studies in Ethiopia.⁹⁻¹¹ Stroke treatment resources in Ethiopia are limited because the health system focuses on treatment for communicable disease. However, primary prevention of stroke might be achievable in primary care settings by early detection and treatment of hypertension.

Despite the hypothesized increase prevalence of stroke in sub-Saharan African countries, including Ethiopia, risk factors for the occurrence of stroke and clinical profiles and outcome of stroke patients are not well described. In addition, several studies from high-income countries have shown that black and white populations from the same region have different stroke incidence, prevalence, and risk factor. For example, hypertension and diabetes mellitus are much more prevalent factors in black than in white populations.^{2,3} The objective of this study was to describe demographic, clinical, and risk factor distributions and outcomes of patients with ischemic and hemorrhagic stroke admitted to a referral hospital in Bahir Dar, Ethiopia.

Materials and Methods

Retrospective study of stroke patients admitted in Felege Hiwot Referral Hospital (FHRH), Bahir Dar, Ethiopia, from February 2014 to August 2016 was conducted. FHRH is the only governmental hospital in Bahir Dar, Ethiopia, with a population of 549,529 in 2012. It has 4 adult medical outpatient clinics and 1 adult intensive care unit. A total of 16,289 patients visit the clinics every month. The hospital catchment area is estimated to be 5-7 million people.¹² FHRH is used as a teaching center for Bahir Dar University College of Medicine and Health Sciences. Computed topography (CT) scan service was not available in the hospital during the study period. However, CT scan service

has been available since 2014 in a 35-bed private hospital, 2.5 km from FHRH.

Patients who were below 18 years of age, who had subarachnoid hemorrhage, and who had incomplete medical records were excluded. Patients with a clinical diagnosis of stroke to whom head CT scan was not performed were also excluded from the study. Of the 508 patients with clinical stroke, 303 remained for analysis after these exclusions.

Data were collected to assess demographic variables (age, sex), clinical factors (hypertension, diabetes, dyslipidemia, atrial fibrillation, human immunodeficiency virus [HIV], past cardiovascular accident, transient ischemic attack, and cancer), behavioral variables (alcohol, smoking), initial clinical presentation, and outcomes of CT proven stroke cases.

General medical practitioners were trained in data collection techniques with respect to study objectives and purpose. A predeveloped data collection tool was used to abstract data from the medical notes of the patients. The data collection tool was pretested for its consistency, completeness, and easy understandability. The data collection process has been closely monitored by the principal investigator (S.G.E.). Collected data have been checked for completeness and consistency. When any gap was identified, it has been communicated to data collectors promptly.

Ethical approval was obtained from Bahir Dar University College of Medicine and Health Sciences ethics committee. Written permission to conduct the study was granted from the health institution involved in the study. Patient informed consent was not required as only anonymous and operational monitoring data were collected and analyzed.

Data Analysis

Data were entered into SPSS Version 20 statistical package software (IBM Corp., Armonk, NY). Frequencies and proportions were used to describe the subjects in relation to the studied variables. According to the study objectives, we used descriptive statistics and results are presented with tables.

Results

Of 508 patients admitted with stroke, 303 (60%) patients had adequate medical record with a CT scan and were included for further analysis. There were 191 (63%) males and 112 (37%) females. [Table 1](#) shows the age distribution of patients.

Hemiplegia was a clinical presentation in 185 (61%) patients and 56 (18.4%) patients presented with loss of consciousness. The number of patients who presented with aphasia is 54 (18%) and 7 (2.3%) patient presented with headache. One patient (.3%) presented with seizure as a complaint.

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