

A Two Year Retrospective Cross-Sectional Study on Prevalence, associated Factors and Treatment outcome among Patients admitted to Medical Ward (Stroke Unit) at Jimma University Medical Center, Jimma, South West, Ethiopia, 2018.

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Abstract

Background: Stroke disorder is one of the most common causes of morbidity and mortality worldwide. Although stroke is being recognized as one of the health problems, its prevalence, risk factor, and treatment outcome in the Ethiopian care setup has not been well documented. Therefore, the objective of this study was to assess prevalence, associated factors and treatment outcome among stroke patients admitted to the stroke unit at Jimma University Medical Center, Jimma, and South West Ethiopia.

Objective: To assess the prevalence, associated factors and treatment outcome among stroke patients admitted to the medical ward (stroke unit) at Jimma University Medical Center, Jimma, and South West Ethiopia.

Methods: a Retrospective cross-sectional study of medical records of patients who were admitted to stroke unit from December 1, 2015, to November 31, 2017. Data collection tools were adapted after reviewing relevant literature and collected by data collectors from patients' chart using the structured checklist. Chi-square was done to know the association between the two variables. Data was cleared and compiled on a master sheet and analyzed manually by using a scientific calculator and presented by using standard tables and diagram.

Result: Among the total sample size of 394 students 367 have participated in the study with a response rate of 93.14%. From a total of study participants, 236(64.31%) had a hemorrhagic stroke while 131(35.69%) had an ischemic stroke and the majority of them had hypertension followed by diabetes mellitus which accounts 123 (29.64%) and 89(21.45%) respectively. Regarding treatment outcome among stroke patients admitted to stroke unit during study period majority of them were died followed by improved which accounts 139(37.87%) and 97(26.43%) respectively.

Conclusion and Recommendation: More than half the study participants 64.31% had a hemorrhagic stroke while 35.69% had an ischemic stroke. There is a significant association between treatment outcome and age and gender i.e., as a p-value of both is 0.00 which is less than 0.05. Therefore, it would recommend that Jimma University Medical Center administration, Jimma University Medical Center staff and other concerned bodies should create proper awareness about risk factors, treatment outcome, and prevention of stroke.

Keywords: Stroke; prevalence; Risk factors; Treatment outcome; JUMC, Ethiopia.

Introduction

Stroke is one of the most common causes of morbidity and mortality worldwide. The latest data from the Global Burden of Diseases Study 2013 (GBD 2013) ranked cerebro vascular disease as the second largest contributor to death and disability-adjusted life years worldwide after ischemic heart disease. There are two main types of stroke hemorrhagic and ischemic stroke. Most of the patients with ischemic stroke present with altered mental status. But, the focal neurologic deficit was the commonest

neurologic presentation among patients with intracerebral hemorrhage (1, 2). The prevalence of ischemic stroke is relatively higher than hemorrhagic stroke in most studies from Africa. In Nigeria, the prevalence of hemorrhagic and ischemic stroke in two hospitals was 29.5% and 54.7% respectively. Neurological disorders are increasingly prevalent in Sub-Saharan Africa. The factors that are producing this increased burden include malnutrition, malaria, HIV/AIDS and other causes of encephalitis and meningitis, demographic transitions, increased vehicular traffic, and persistent regional conflicts (3).

Treatments of people with stroke provided by multidisciplinary teams in a stroke unit result in better outcomes. Observational studies and trials of stroke treatment of patients from Europe, Australia, and Argentina have reported considerable variation in the processes of stroke treatment and associated outcomes (4, 5).

A retrospective cross-sectional study conducted in the first Hospital of Jilin University, Chang Chun, China on prevalence of stroke and associated risk factors showed that the overall prevalence of stroke in Jilin Province was 7.2% (95% CI 6.3% to 8.2%). Of all stroke cases, 91.7% (95% CI 87.4% to 94.6%) were ischemic stroke and 8.3% (95% CI 5.4% to 12.6%) were hemorrhagic stroke. The prevalence rates of dyslipidemia, smoking, and hypertension were ranked as the top three cerebrovascular risk factors and were 62.1%, 61.8%, and 57.3%, respectively. This study also showed that hypertension, dyslipidemia and lack of exercise were associated with ischemic stroke. However, only hypertension (OR=4.064, 95% CI 1.358 to 12.160) was significantly associated with hemorrhagic stroke (6).

Another retrospective study conducted on assessments of prevalence and risk factor among admitted patients in China showed that when type of stroke was tabulated against mortality, forty-nine (out of 187) (26.2%: 95% CI=19.8;32.6) of the patients with ischemic stroke died while 51/214 (23.8% 95% CI= 18.1;29.6) died among hemorrhagic strokes. No difference in mortality was found between hemorrhagic and ischemic strokes ($p=0.584$) (7).

A one-year retrospective study conducted on pattern and outcomes of patients with stroke admitted in tertiary hospitals in Zimbabwe showed that from a total of 450 stroke cases, (63% women) were included in the final analysis. The proportion of stroke cases among the admissions was 0.61%. Risk factors were hypertension (58.5%), diabetes (18%) and HIV, (14%). In-hospital mortality was 24.9%, 95% CI (20.9; 29.0%). Mortality was associated with the place of admission ($p<0.001$). Gender and side of stroke were significantly associated ($p<0.001$). (8). A prospective hospital-based study conducted at another center in Ethiopia reported ischemic stroke as the commonest type of stroke. The pattern of admissions for neurological diseases among Ethiopian patients at two hospitals in Addis Ababa about three decades ago showed stroke (45%) and bacterial meningitis (12%) as the two most common causes of admissions (9).

A retrospective study conducted on assessment of risk factors and treatment outcome of stroke admissions at St. Paul's Teaching Hospital showed that hypertension was found to be the most common antecedent risk factor in 92 (56.4%) patients. Diabetes mellitus (DM) was identified as a risk factor in 19 (11.6%) patients and 14 (8.5%) patients had both hypertension and diabetes mellitus. In-hospital case fatality rate of stroke was 30.1%. Most (45.4%) patients were discharged with the significant neurologic deficit. Only 36 (22.1%) patients were discharged with significant neurologic improvement. Among in-hospital deaths, the majority (63.3%) were in those with intracerebral hemorrhage. Of 11 patients who had a previous history of stroke, 7 (63.4%) died in hospital showing a statistically significant association ($p=0.049$) (10).

A retrospective cross-sectional study of patients admitted with a clinical diagnosis of stroke on characteristics and outcomes of the stroke at Tikur Anbessa Teaching Hospital showed that hemorrhagic stroke was the most common cause of stroke accounting for 57% of all patients. Hypertension was the most frequent risk factor identified followed by cardiac disease, 65.6%, and 22.7% respectively. The overall mortality was 44.5%. Altered mental state and non-focal neurologic deficits were the only independent predictors of mortality (11). There is a great need for organized research that is closely linked to assess prevalence, associated risk factor, and treatment outcome of stroke. On the assessment of prevalence, associated risk factor and treatment outcome of stroke study is almost non-existent in our local setting (study areas). Although stroke is being recognized as one of the health problems, its prevalence, risk factor, and treatment outcome in the Ethiopian care setup has not been well documented. Information on stroke and associated risk factors could help in tuning up the service delivery for stroke patients. Therefore, the objective of this study was to assess prevalence, associated factors and treatment outcome among stroke patients admitted to the medical ward at Jimma University Medical Center, Jimma, and South West Ethiopia.

Materials And Methods

The study was conducted at Jimma University Medical Center from December 1, 2015, to November 31, 2017, which is located in Jimma Zone, Oromia region. JUMC is a university teaching hospital and is the only referral hospital for the southwestern of Ethiopia. Jimma is located 357km South West of the capital city of Ethiopia, Addis Ababa. All patients admitted to JUMC were used as a source population with a total sample size of 394.

Study design

Retrospective cross-sectional study design was conducted with the total sample size 394 which was obtained by using single population proportion formula among patients admitted to medical ward from December 1, 2015, to November 31, 2017, in JUMC.

Data Collection Methods

Data was collected by trained data collectors using a checklist sheet from the medical records of those patients who had been admitted to the medical ward over the specified time period based on inclusion criteria patients with neurological problems who are 15 years and older. The checklist was developed after a review of different kinds of literature and contained socio-demographic data, HIV status, type of stroke, common risk factors, diabetes mellitus, substance use, and atrial fibrillation) and possible treatment outcomes of patients. Before commencing data collection, ethical clearance and approval were obtained from Jimma University, College Health Science and Medicine, Department of Nursing. Oral informed consent was secured from the involved participants for their participation after the nature of the study was fully explained to them. The right to refuse was respected and data was collected respectfully.

Result

Socio-demographic characteristic of the study population

From the total sample size of 394 students, 367 have participated in the study with a response rate of 93.14%. Of these 234(63.8%) were males and 133(36.2%) were females. From

total participants, 143 (38.96%) were Muslims religion followers followed by orthodox 117 (31.88). Oromo were the majored scored from ethnic groups which had 153 (41.69%) followed by Ahmara which accounts 116 (31.61%) as shown in (Table 1) below.

Table 1:- Socio-demographic distributions of respondents among stroke patients admitted to Medical wards, in JUMC, Jimma zone Southwest Ethiopia, 2018.

Variables	Category	Frequency	Percentage (%)
Age	<25	14	3.82
	25-44	40	10.9
	45-64	182	49.59
	=>65	131	35.69
	Total	367	100
Sex	Male	234	63.8
	Female	133	36.2
	Total	367	100
Marital status	Married	336	91.55
	Single	28	7.63
	Others (widow, divorce...)	3	0.82
	Total	367	100
Religion	Muslim	143	38.96
	Orthodox	117	31.88
	Protestant	56	15.26
	Catholic	37	10.08
	Other (Java, Waqeffata, Adventist)	14	3.82
	Total	367	100
Ethnicity	Oromo	153	41.69
	Ahmara	116	31.61
	Tigray	37	10.08
	Garage	32	8.72
	Dawaro	16	4.36
	Other (Kaffa, Hadiya, Silte, sumale,)	13	3.54
	Total	367	100

Types of stroke

Concerning types of stroke among stroke patients admitted to stroke unit during the study period, from a total of study participants 236(64.31%) had the hemorrhagic stroke while 131(35.69%) had an ischemic stroke. Regarding association between dependent variables (types of stroke) and independent variables (age and gender) there is statically significant association between types of stroke and age as p-values <0.05

(0.008) and no association between gender and types of stroke p-value is >0.05(0.714) as displayed in the (Table 2) below.

Risk factors of stroke

Concerning respondent's risk factors of stroke among study participants majority of them had hypertension followed by diabetes mellitus which accounts 123 (29.64%) and 89(21.45%) respectively as shown in the (Table 3).

Table 2:- Distributions of respondents by types of stroke and association with age and gender, among stroke patients admitted to stroke unit, in JUMC, Jimma zone Southwest Ethiopia, 2018.

Parameter		Type of stroke No (%)				Total		X2	p-value
		Ischemic		Hemorrhagic					
		No	(%)	No	(%)	No	(%)		
Age (years)	<25	5	1.36	9	2.45	14	3.82	1.36	0.008
	25-44	11	2.99	29	7.9	40	10.9		
	45-64	66	17.98	116	31.61	182	49.59		
	=>65	49	13.35	82	22.34	131	35.69		
	Total	131	35.69	236	64.31	367	100		
Gender	Male	92	25.06	194	52.86	286	77.93	7.02	0.714
	Female	39	10.62	42	11.44	81	32.07		
	Total	131	35.69	236	64.31	367	100		

Table 3:- Distributions of respondents by risk factors of stroke among stroke patients admitted to a stroke unit, in JUMC, Jimma zone Southwest Ethiopia, 2018.

Risk factor	Number	(%)
Hypertension	123	29.64
Diabetes Mellitus	89	21.45
Previous Stroke	66	15.91
Atrial fibrillation	45	10.84
Transient ischemic attack	43	10.36
Structural heart disease	43	10.36
Others(HIV, RF, CHF)	6	1.44
Total	415	100

Treatment outcome

Regarding treatment outcome among stroke patients admitted to stroke unit during study period majority of them were died followed by improved which accounts 139(37.87%) and 97(26.43%) respectively. From those died majority of them

were at age of =>65 followed by age between (45-64) which accounts 77(20.98%) and 51(13.89%) respectively and male by gender 116(31.61%). Regarding the association between dependent (treatment outcome) and independent variables (age and gender), there is a significant association between treatment outcome and age and gender i.e. as a p-value of both is 0.00 which is less than 0.05 as depicted in the (Table 4) below.

Table4:- Distributions of respondents by treatment outcome among stroke patients admitted to medical wards (stroke unit), in JUMC, Jimma zone, Southwest, Ethiopia, 2018.

Socio-demographic factor		Treatment Outcome										X2	Df	p-value
		Dead		Improved		Discharged with Neurologic Deficit		Discharged against Medical Advice		Total				
		No	(%)	No	(%)	No	(%)	No	(%)	No	(%)			
Age	<25	2	0.54	6	1.63	2	0.54	4	1.09	14	3.82	68.1	9	0
	25-44	9	2.45	13	3.54	11	2.99	7	1.91	40	10.9			
	45-64	51	13.89	66	17.98	40	10.89	25	6.81	182	49.59			
	=>65	77	20.98	12	3.27	33	8.99	9	2.45	131	35.69			
	Total	139	37.87	97	26.43	86	23.43	45	12.26	367	100			
Gender	Male	116	31.61	78	21.25	70	19.07	22	5.99	286	77.93	25.5	3	0
	Female	23	6.27	19	5.18	16	4.36	23	6.26	81	32.07			
	Total	139	37.87	97	26.43	86	23.43	45	12.26	367	100			

Discussion

This study revealed that from a total of study participants 236(64.31%) had a hemorrhagic stroke while 131(35.69%) had an ischemic stroke. This finding is higher compared with a retrospective cross-sectional study conducted in the first Hospital of Jilin University, Chang Chun, China on Prevalence of stroke and associated risk factors which showed that the overall prevalence of stroke in Jilin Province was 7.2% (95% CI 6.3% to 8.2%). Of all stroke cases, 91.7% (95% CI 87.4% to 94.6%) were ischemic stroke and 8.3% (95% CI 5.4% to 12.6%) were hemorrhagic stroke (6). The possible explanation for this difference is may be due to a difference in the study area (developed country vs developing country), study year and study period. This study also showed that association between dependent variables (types of stroke) and independent variables (age and gender) there is the statically significant association between types of stroke and age as p-values <0.05 (0.008) and no association between gender and types of stroke p-value is >0.05(0.714). This finding is the difference when compared with a one-year retrospective study conducted on pattern and outcomes of patients with stroke admitted in tertiary hospitals in Zimbabwe showed mortality was associated with place of admission (p<0.001). Gender and side of stroke were significantly associated (p<0.001) (8).This difference may need further investigation to be certain. This study also showed that among study participants the majority of them had hypertension followed by diabetes mellitus which accounts 123 (29.64%) and 89(21.45%) respectively. This finding is lower compared with a retrospective study conducted on an assessment of risk factors and treatment outcome of stroke admissions at St. Paul’s Teaching Hospital which showed that hypertension was found to be the most common antecedent risk factor in 92 (56.4%) patients and higher with respect to Diabetes mellitus which showed that (DM) was identified as a

risk factor in 19 (11.6%) patients and 14 (8.5%) patients had both hypertension and diabetes mellitus (10).This difference is may be due to the difference in the study area, study year and study period. This study also showed that the majority of them were died followed by improved which accounts 139(37.87%) and 97(26.43%) respectively. Regarding the association between dependent (treatment outcome) and independent variables (age and gender), there is a significant association between treatment outcome and age and gender i.e. as a p-value of both is 0.00 which is less than 0.05. It is different when compared with another similar study conducted in China which showed that when type of stroke was tabulated against mortality, forty-nine (out of 187) (26.2%: 95% CI=19.8; 32.6) of the patients with ischemic stroke died while 51/214 (23.8% 95% CI= 18.1; 29.6) died among hemorrhagic strokes. No difference in mortality was found between hemorrhagic and ischemic strokes (p=0.584) (7). This difference is may be due to the difference in the study area, study year and study period.

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Conflict of Interests

All authors declared that they have no conflict of interests.

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