

ORIGINAL ARTICLE

SUBARACHNOID HEMORRHAGE: CLINICAL PRESENTATION, CAUSES AND OUTCOME IN 52 ETHIOPIAN PATIENTS

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ABSTRACT

Introduction: Subarachnoid hemorrhage is a devastating neurological emergency associated with high mortality and disability. Little is known about its occurrence and clinical profile in Ethiopia. We, therefore, studied the clinical presentation, causes and outcome of the condition among in a tertiary facility.

Methods: A retrospective analysis of records of patients admitted with the diagnosis of subarachnoid hemorrhage to Tikur Anbassa Specialized Hospital over a period of 12 years, January 2001 to January 2012, was undertaken.

Results: Of 725 patients admitted with the diagnosis of stroke 52 (7.1%) patients were diagnosed to have subarachnoid hemorrhage. Death was registered in 18(34.6%) and disability in seven (13.4%). Hypertension was the most common risk factor, observed in 36 (69.21 %) of the patients, and seizure disorder and electrolyte abnormalities-hyponatremia were the most common complications.

Conclusion: The outcome of subarachnoid hemorrhage in this study is comparable with reports from elsewhere. A prospective and well-designed epidemiological study is recommended. There is a need to improve the diagnostic and interventional capacity of the hospital.

Key words: Stroke. Subarachnoid Hemorrhage. Ethiopia

INTRODUCTION

Different studies have shown that around 20% of strokes are hemorrhagic, with subarachnoid hemorrhage (SAH) and intracerebral hemorrhage, each accounting for 10%. Most SAHs are caused by ruptured saccular aneurysms. In the United States of America approximately 20% to 30% of patients have multiple aneurysms. Rupture of an intracranial aneurysm is believed to account for 0.4% to 0.6% of all deaths (1-3). The proportion of deaths due to SAH appears to be decreasing over time in the West due to improvement in diagnosis and management of patients (4-6).

Major modifiable risk factors for SAH are cigarette smoking and hypertension (HTN) (7-10). Moderate to severe alcohol consumption and family history SAH increase the risk of SAH where family history shows heterogeneous susceptibility (9-14). There is a female preponderance for aneurysms ranging from 54 to 61 percent (2,15).

The premier symptom is a sudden, severe headache in 97% of patients classically described as the “worst headache of my life.” The onset of the headache may or may not be associated with a brief loss of consciousness, seizure, nausea, vomiting, or meningismus, which may not develop until several hours. Approximately 30 to 50 percent of patients have a minor hemorrhage or “warning leak” the sentinel headache which is important to consider in the diagnosis of SAH (6-19).

A number of complications can occur in patients who have suffered a SAH. Among these are vasospasm, rebleeding, seizures, electrolyte abnormalities raised intracranial pressure and hydrocephalus which are seen in different frequencies in different studies (20-25).

The primary objective of the study is to find out the major causes of non-traumatic subarachnoid hemorrhage, its clinical presentation and treatment and treatment outcomes in patients admitted to Department of Internal Medicine of Tikur Anbassa Specialized Hospital (TASH), a teaching Hospital of Addis Ababa University during the study period of August 2000- September 2012.

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PATIENTS AND METHODS

A cross-sectional retrospective study was done on charts of patients admitted between from January 2001 to January 2012 with the diagnosis of SAH. Findings from history, physical examination, laboratory and imaging data was documented on all SAH patients at TASH. questionnaire was developed in English and was used for data collection, which was collected by the investigator.

Frequencies and percentages were calculated for all variables, which were related to the objectives of the study. Proportions for different causes of SAH and its complications were determined and comparisons made with the findings from similar studies in other countries.

RESULTS

During the study period, there were 725 patients admitted to TASH with diagnosis of stroke, of these patients 52 (7.1%) were diagnosed to have SAH. The

data from the 52 patients were analyzed in this study. Thirty-nine (75%) of the patients came from Addis Ababa, while the rest came from the different regions of the country. The mean duration of arrival at the hospital after the ictus was 3.18 days with SD \pm 2.27 while the median was 3 with IQR of (4) days. Among the 52 patients 36(69, 2%) were admitted to the Medical ICU while the rest were admitted to the general ward initially and transferred later to the MICU.

The age of the patients ranged from 17 to 67 years, while the mean age of the patients was 45.3 with SD \pm 13.3. The median was 46.5 with IQR of 18. Among the 52 patients 29, (55.8%) were male and 23 (44.8%) were female and 18 (34.6%) of the patients died and disability occurred in 7 (13.5%) of the patients. The rest recovered and discharged from in good condition. The mean duration of hospital stay was 25.37 days with SD \pm 31.58. (Table 1)

Table 1:Sociodemographic Data of 52 patients admitted with subarachnoid hemorrhage to Tikur Anbassa, Specialized Hospital, Addis Ababa, 2001 -2012

Age		SEX		Patients Address by Regions				HTN History		HTN Treatment		DM History		Na+ HYPO		Seizures		Death	
<i>M</i>	<i>EAN</i>	<i>M</i>	<i>F</i>	<i>AA</i>	<i>ORO</i>	<i>AMH</i>	<i>SNNPR</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>
45.3	46.5	29	23	38	5	5	5	39	13	6	46	3	49	14	28	19	33	18	34

HTN- Hypertension DM-Diabetes Mellitus M- Male F- Female HYPO-Hyponatremia, AA- Addis Ababa ORO-Oromia AMH- Amhara SNNPR- Southern Nations Nationalities and Peoples

All 52 patients gave the history of sudden severe headache. Decreased level of consciousness was seen in 33 (63.5%). while 1 (1.9%) had history of photophobia, 44 (84.6%) had history of meningismus and 45 (86.5%) had nausea and vomiting 21(40.4%) gave history of sentinel bleed in the past two weeks; 6 (11.5%) gave history of seizure at the onset. Lethargy was reported in 36(69.2%), 44 (84.6%) reported neck pain and 23 (44.2%) had a motor deficit. (Table 2).

According to the Hunt and Hess staging of SAH 13/52 (25%)of the patients were in stage I, 10/52 (19.2%)of them were in stage II, 12/52 (23%)were in stage III, 11/52 (21.2%) in stage IV and 6/52 (11.5%) in stage V at admission. Only 4/52 (7.7%) the patients had prior history of chronic headache before the onset of the illness; otherwise none of them gave history oculomotor paresis, impaired visual acuity, migraine, aphasia, endocrine dysfunction other than diabetes, or other focal weakness. (Table 3)

Table 2: Clinical presentation of 52 patients to Tikur Anbassa Specialized Hospital with subarachnoid hemorrhage, Addis Ababa, 2001 to 2012

Clinical presentation	Number	Percent
Sudden Severe headache	52	100%
Nausea and vomiting	45	86.5%
Neck pain	44	84.6%
Meningismus	44	84.6%
Lethargy	36	69.2%
Decreased level of consciousness	33	63.5%
Sentinel bleed in the past two weeks	21	40.4%
Motor deficit	23	44.2%
Seizure at the onset	6	11.5%
History of chronic headache	4	7.7%
Photophobia	1	1.9 %

Table 3: Gender, Hunt & Hess Stage and Death Outcome in 52 patients with Subarachnoid Hemorrhage admitted to Tikur Anbassa Specialized Hospital, Addis Ababa, 2001 -2012

Gender	Death	Hunt & Hess Stage					Total
		I	II	III	IV	V	
Female	No	7	4	1	1	0	13
	Yes	0	1	2	3	4	10
	Total	7	5	3	4	4	23
Male	No	6	5	6	3	1	21
	Yes	0	0	3	4	1	8
	Total	6	5	9	7	2	29
Total	No	13	9	7	4	1	34
	Yes	0	1	5	7	5	18
Total		13 25%	10 19.2%	12 23.1%	11 21.2%	6 11.5%	52 100%

Among the 52 patients 43(82.7%) had computed tomography (CT) scan and five (9.6%) had magnetic resonance imaging (MRI) of the head. All patients had complete blood count (CBC) and erythrocyte sedimentation rate (ESR) determined. Twenty-three (44.2%) of the 52 patients had cerebrospinal fluid CSF analysis, of which 10(43.4%) were hemorrhagic, while 13(56.5%) were xanthochromic. Twenty-one (40.3%) of the 52 patients had both CSF analysis and CT scan of the head. Forty-eight (92.3%) of the 52 patients had chest radiograph, and forty-eight (92.3%) had measurement of electrolytes, including sodium, potassium, chloride and calcium. Five patients had screening for HIV and four turned out to be positive.

Among the forty eight patients who had determination of serum electrolyte, abnormalities were seen in 22/48 (45.8%). Hyponatremia was seen in 14/48 (29.1%), while three patients (5.7%) had deranged renal function. Seizure was seen in 19/52 (36.5%) of the patients. Nineteen of the 52 patients (36.5%) had generalized, of these nine had focal seizures with secondary generalization, while two developed status epilepticus. Vaso-spasm was considered in 6/52 (11.5%) of the patients. Rebreeding was presumed cause of death in 4/18 (22%) of the patients who died. Seven of the 48 (14.5%) of the patients had Chest X-ray proven pneumonia, while 2/52(3.8%) had deep vein thrombosis (DVT) of the lower extremities. Six(11.5%) were found to have electrocardiography (ECG) abnormality showing left ventricular hypertrophy.

Among the risk factors HTN was detected in 36/52 (69.2% of the patients. Twenty-four (66%) had HTN for less than five years, while 25% had HTN for more than five years and 8% had HTN for more than ten years. Among the thirty-six patients only 6/36 (16%) had proper treatment.

Four of 52 (7%) of patients gave history of smoking cigarette. Only three (13%) of the female patients were found to have recent delivery, while 7/52 (13.4%) of the patients gave history of Khat use and moderate alcohol consumption. None of the patient has similar history among their relatives. All patients

were treated conservatively with no surgical or endovascular treatment during their stay in the hospital

Among the fifty-two patients admitted to the hospital with the diagnosis of nontraumatic SAH 18/52 (34.6%) died within the first 30 days. Most of the death occurred in the first two weeks of hospitalization. While 18/34 (52.9%) showed good recovery at discharge, seven had moderate to severe disability. Two (5.8%) patients were discharged with moderate disability, while other 8.8% had severe disability. One patient was discharged in persistent vegetative state. (Table 4)

Table 4: Patient's Age Category, Gender and Death Outcome for 52 patients admitted to TAH from 2001 to 2012

Gender	Death Outcome	Patient's Age Category in Years					Total
		10-19	20-39	40-49	50-59	60-69	
Female	No	0	-	0	4	8	13
	Yes	1	-	2	2	5	10
		1	-	3	6	13	23
Male	No	1	0	4	7	9	21
	Yes	1	4	0	1	2	8
		2	4	4	8	11	29
Total	No	1	0	5	11	17	34
	Yes	2	4	2	3	7	18
Total		3	4	7	14	24	52

DISCUSSION

In this study, we have seen a male predominance, an observation that is not concurring with previous observations which documented a female predominance among patients with non-traumatic SAH (2,26). A multinational comparison of SAH in the WHO MONICA stroke study has shown that the generally accepted view is that women have a higher risk of SAH than men may not apply to all population groups (3). This could also be explained by the gender bias in the utilizations of health services in study areas (27) and lack of adequate sample size to identify to significantly identify difference in occurrence by gender.

In our series, the time of arrival at the hospital ranged from 12 hours to 15 days. The longest delay was for those coming from the regions. Some of the patients were treated in private health care facilities prior to their transfer to TASH. A majority of the patients in this study were relatively young, in the 40-59 age

categories. Many studies have shown that SAH is a neurological problem of the relatively young, but our patients were even younger than those reported by other studies.

SAH has a clinical presentation that varies from simple headache to obvious neurological deficits. The clinical presentation in our patients was not different from those seen in other studies. In other studies, HTN, cigarette smoking, history of similar illness in the family and drug abuse were risk factors for SAH (7-10). In our study, we found out that a little over 60% of the patients were known to have HPN but only six of these patients were on regular follow up or treatment for HPN. Few of those who took medication for HPN took their medication erratically or have discontinued their medication during the ictus. Seven percent of the patients gave history of cigarette smoking moderate alcohol consumption. Two patients gave history of Khat use. We could not find adequate studies to compare the risk factor for SAH identified in our study.

Reports on case fatality associated with SAH show varying results, ranging from less than 10% to greater than 60% (3). In our study, most of the death occurred in the first two weeks after admission and it occurred in 34.6% of the patients, of which 8/18 (44.4% were male and 10(55.6%) were female. While occurrence of death falls in the range mentioned above, the 30-day death from SAH approaches 50%, concurring with observation by others (39). Most of the death occurred in those patients who were admitted in stages III-V. In other studies, the proportion of death for this group of patients approaches 80% (26). The three-month death outcome of patients who suffered SAH reaches 25% even after exclusion of the moribund patients (26). As there was not adequate follow-up in this study, we could assess this outcome. (Table 4)

The most common complication seen was seizure. This number is bigger than the figures reported in other studies (26). Among the 18 patients who died, 44.4% had seizure. The second most common complication was electrolyte abnormality; this also concurs with what has been reported by other studies (26). Most of the initial diagnosis in our series was based on clinical history and physical examination supported by the CSF finding. Lack of adequate diagnostic imaging facilities led to inability to reach definitive diagnosis regarding the exact cause of SAH.

The three most commonly considered differential diagnoses in our patients were acute bacterial meningitis, hypertensive encephalopathy and hemorrhagic stroke. This could be the reason for the initial use of antibiotics in patients which didn't have emergent CT scan of the brain.

This study has several limitations. The retrospective nature of the study, it is possible that the condition could be underestimated. Due to the inadequate nature of record keeping some of the data for the study was missing and could not be analyzed. Owing to the limitation in the sample size in our series, statistical analysis was not done for many variables included in the study.

There is a need to improve the diagnostic and treatment capability of the emergency department and as well as the diagnostic imaging and laboratory services. There is also a need to improve the admission and treatment capability of the medical intensive unit (MICU). Strengthening the neurosurgical capacity at the hospital is of paramount importance to deliver the definitive management of SAH an entity with high mortality. We need also to increase awareness among the general population about the prevention and treatment of HPN which is a major preventable risk factor for SAH as well as the other forms of stroke. A prospective and well-designed study is required to assess SAH in a more comprehensive manner.

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