International Journal of Medical and Health Research
ISSN: 2454-9142
Impact Factor: RJIF 5.54
www.medicalsciencejournal.com
Volume 3; Issue 11; November 2017; Page No. 106-109

A study on clinical profile of patients with acute ischemic stroke

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Abstract
Introduction: Cerebrovascular disease ranks the *first* in frequency and importance among all the neurological diseases in adult life. Stroke is the most common cause of death, after heart disease and cancer. Cerebrovascular disease is estimated to account for 7.8 million deaths yearly throughout the world and represents about 13 % of all causes of death.
Methodology: Data was collected using a pretested proforma meeting the objectives of the study. Detailed history, physical examination and necessary investigations will be undertaken. The purpose of the study was explained to the patient and informed consent obtained.
Results: Acute Ischemic Stroke with headache and vomiting in 12% and 8% of the study population respectively.
Conclusion: Our study shows a greater preponderance among men with male to female ratio of 1.7: 1.

Keywords: acute ischemic stroke, cerebrovascular disease, lipid profile

Introduction
A stroke is defined by the World Health Organization (WHO) as a syndrome of "rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin [1].
Historically the first depiction of stroke may not originate from Hippocrates but from the Chinese (475-221 B.C.). Hippocrates mentioned stroke in about 400 B.C., but it was the Roman physician Aurelius Celsus (25 B.C.-A.D. 50) who described "apoplexy" and discriminated it from "paralysis". The term "hemiplegia", which is still in use, was introduced by Paul of Aegina (A.D. 625-690). Gregor Nymman of Wittenberg (1594-1638) described the idea of interrupted circulation in the brain vessels as a cause of apoplexia. A Swiss physician, Johann Jakob Wepfer of Schaffhausen (1620-1695) stated that corpulent people and those with an irregular pulse, and in addition those whose face and hands are of bluish colour, are at great risk of suffering a stroke. This could indicate that persons with hypertension or cardiac failure are vulnerable. Among the first to link atherosclerosis to apoplexy was Francis Bayle (1622-1709). The English physician William Heberden (1710-1801) noted that transient ischemic attacks (TIA) often occur shortly before stroke. A description of "diseased and roughed" arteries or embolism from the heart causing neurological deficit is found in Allbutt's System of Medicine (1899). In 1930, increased blood pressure was described as being connected to apoplexia and cerebral hemorrhage by Swartz and Goldinger [2].
Cerebrovascular disease ranks the *first* in frequency and importance among all the neurological diseases in adult life. Stroke is the *most common cause* of death, after heart disease and cancer. Cerebrovascular disease is estimated to account for 7.8 million deaths yearly throughout the world and represents about 13 % of all causes of death. Stroke remains among the five leading causes of death across every income group in most countries in the last comprehensive review by the World Health Organization. It causes significant physical, *emotional, and cognitive* disabilities among survivors, placing stroke within the 10 leading causes of disability irrespective of the development status of countries [3].

Methodology
Method of Collection of Data
Patients satisfying inclusion criteria were enrolled within 24 hours of admission after informed consent.

Sample Size
100 cases satisfying inclusion criteria will be included

Study Design
Longitudinal study.

Methodology
Data was collected using a pretested proforma meeting the objectives of the study. Detailed history, physical examination and necessary investigations will be undertaken. The purpose of the study wase explained to the patient and informed consent obtained.

Inclusion Criteria
1. Patients aged ≥ 40 years irrespective of gender
2. Diagnosed as having acute ischemic cerebrovascular stroke within previous 72 hours by clinical examination and confirmed by either a CT scan or by a MRI Scan were included.

Exclusion Criteria
1. Age < 40 years

2. Presenting with hemorrhagic stroke/ subarachnoid hemorrhage/ cerebral venous sinus thrombosis
3. Presenting with ischemic stroke after 72 hours of onset were excluded from study.
4. Patients with previous history of Transient Ischemic Attack (TIA) / Cerebro Vascular Accident (CVA)
5. Patients who are on thiazide diuretics/ known cases of gout or show clinical evidences of gout/ Chronic Kidney Disease (CKD)

Results

Table 1: Age and Sex Distribution in Study Population

Age Group		Male		Female		Total
	No	%	No	%	No	%
40-49	4	6%	0	0%	4	4%
50-59	25	40%	20	54%	45	45%
60-69	24	38%	14	38%	38	38%
70-79	9	14%	3	8%	12	12%
80 & Above	1	2%	0	0%	1	1%
Total	63	100%	37	100%	100	100%

In our study, out of 100 patients, 63% were males and 37% were females.
Thus, the ratio of males to females was 1.7: 1.

Maximum patients were in 50-59 years' age group.
Acute Ischemic Stroke is more common between 5th and 6th decade of life.

Table 2: Sex Distribution

Overall distribution	Number of patients	Percentage of patients
Female	37	37%
Male	63	63%

Our study shows a greater preponderance among men with male to female ratio of 1.7: 1
Males are more likely to have a stroke than women.

Table 3: Presenting Symptoms in Study Population

Symptoms		Male	Female		Total	
	No	%	No	%	No	%
Central Facial Palsy	29	46%	14	38%	43	43%
Headache	7	11%	5	14%	12	12%
Nausea/ Vomiting	5	8%	3	8%	8	8%
Motor weakness	63	100%	37	100%	100	100%
Altered Consciousness	4	6%	0	0%	4	4%
Speech Disturbance	19	30%	5	14%	24	24%
Vertigo	3	5%	2	5%	5	5%
Tingling/ Numbness	15	24%	4	11%	19	19%
Seizures	2	3%	1	3%	3	3%

All patients presented with motor weakness.
43% of patients presented with facial nerve palsy and 24 % presented with dysarthria.
Sensory disturbance as presenting feature in 19%
3 % presented with seizures at presentation.
Acute Ischemic Stroke with headache and vomiting in 12% and 8% of the study population respectively.

Table 4: Distribution According To Lipid Profile

Lipids		Gender	Total
	Male (n=63)	Female (n=37)	(n=100)
Total Cholesterol			
<200	57(90.5%)	37(100%)	94(94%)
200-280	6(9.5%)	0(0%)	6(6%)
>280	0(0%)	0(0%)	0(0%)
Triglyceride			
<150	23(36.5%)	10(27%)	33(33%)
150-500	40(63.5%)	27(73%)	67(67%)
>500	0(0%)	0(0%)	0(0%)
HDL			
<35	16(25.4%)	8(21.6%)	24(24%)
35-60	44(69.8%)	27(73%)	71(71%)
>60	3(4.8%)	2(5.4%)	5(5%)
LDL			
<70	20(31.7%)	11(29.7%)	31(31%)
70-190	43(68.3%)	26(70.3%)	69(69%)
>190	0(0%)	0(0%)	0(0%)

We documented hypercholesterolemia in nearly 95 % of cases And 67 % had hypertriglyceridemia

Table 5: Lipid Parameters

Lipids	` Male	Female	Total	P value
Total Cholesterol	160.19±23.93	155.41±19.18	158.42±22.31	0.303
(mg/dl)				
TGL (mg/dl)	164.44±34.35	172.30±39.78	167.35±36.45	0.301
HDL (mg/dl)	43.29±10.66	41.32±9.77	42.56±10.33	0.362
LDL (mg/dl)	84.05±25.10	79.54±22.02	82.38±23.99	0.367
VLDL (mg/dl)	32.86±6.91	34.54±7.96	33.48±7.32	0.269

Table 6: Distribution According To Blood Sugars

	Gender		**Total**
	Male	Female	(n=100)
	(n=63)	(n=37)	
FBS (mg/dl)			
<100	43(68.3%)	25(67.6%)	68(68%)
100-126	3(4.8%)	2(5.4%)	5(5%)
>126	17(27%)	10(27%)	27(27%)
PPBS (mg/dl)			
<140	35(55.6%)	20(54.1%)	55(55%)
140-200	12(19%)	8(21.6%)	20(20%)
>200	16(25.4%)	9(24.3%)	25(25%)
HbA1c %			
<6	44(69.8%)	21(56.8%)	65(65%)
6-9	19(30.2%)	16(43.2%)	35(35%)
>9	0(0%)	0(0%)	0(0%)

Discussion

Stroke is the leading cause of disability worldwide, the second most common cause of dementia and the third leading cause of death [4].

The well recognized risk factors for stroke like age, smoking, diabetes, hypertension, metabolic syndrome explain only a part of the cases. Hence a search for other risk factors is the need of the hour.

The mean age of the cases was 61.31 ± 7.15 years with the range of 48 to 80 years.The male to female ratio was 1.7:1.

Mumbai[5] and Trivandrum[6] registries showed that the mean age of patients with stroke was 66 and 67 years respectively. In contrast, in the Bangalore study the mean age was 54.5 years. Our findings are consistent with the data published by Pandiyan *et al.* [7] who observed a male: female ratio of 1.9:1 and mean age of stroke patients as 61.7 ± 13.4 years.

There are a few clinical studies which looked at the prognostic significance of serum Calcium levels in acute stroke patients.

D' Erasmo E *et al.* [8]. studied total calcium, albumin corrected calcium and ionized serum calcium levels in patients affected by transient ischemic attack (TIA) and ischemic cerebral infarction, in order to evaluate the clinical and prognostic significance of calcemic status during the acute phase of these events. These results demonstrated that the calcium level is decreased in cerebral ischemia and that more substantial changes are observed in ischemic cerebral infarction than in TIA and controls ($p < 0.0001$, $p < 0.02$ and $p < 0.0001$ respectively for Total calcium, albumin corrected calcium and ionized serum calcium levels). Serum Ca values were found to decrease in patients with cerebral infarction and lower total serum Ca levels were detected in patients who died during hospitalization compared with survivors.

Buck BH, Liebeskind DS, Saver JL, Bang OY, Starkman S. *et al.* [9]. reported that higher total serum Ca values detected on admission in acute ischemic stroke patients were associated with smaller cerebral infarct volumes.

Ovbiagele and colleagues[10] found that higher total serum Ca values measured in the first 24 hours were associated with lesser severity of the stroke and better functional prognosis at discharge.

Gaurav M Kasundra, Isha Sood, Bharat Bhushan, *et al.* [11]. revealed that lower total serum Ca values measured in the first 24 hours of ischemic stroke are associated with more severe clinical findings. Results showed a statistically significant ($P < 0.05$) correlation of AIS with both calcium level and corrected calcium level.

In our study, the mean serum calcium and albumin-corrected calcium levels on admission were 8.5± 0.7 mg/dL and 8.8 ± 0.4 mg/ dL respectively, and the mean initial NIHSS score was 10.4. We found a statistically significant ($P = 0.00$) correlation of Acute Ischemic Stroke with both calcium level and corrected calcium level (0.004). Both Serum calcium level and albumin-corrected calcium level has a significant correlation with neurological severity (NIHSS, p value < 0.001 & <0.002 in both) and short term outcome (Barthel index, p value < 0.002& <0.004 respectively) after acute ischemic stroke in our study.

Conclusion

- The mean age of the cases was 61.31 ± 7.15 years with the range of 48 to 80 years.
- The male to female ratio was 1.7:1.

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