Study of Clinico Radiological Profile of Ischemic Cerebrovascular Stroke and Its Outcome at Tertiary Care Centre

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Abstract

Background: Ischemic CV stroke is disease of long term Disability and Death accounts for >80% of total stroke events. The main objective of the study was to study clinical and radiological profile, risk factors and outcome of stroke. Subjects and Methods: An observational study of 46 patients of acute ischemic cerebrovascular stroke was conducted during January 2014 to November 2014. All patients were subjected to Sociodemographic, Clinical, family h/o risk factors, dietary, other lifestyle habits and examination with written consent. Apart from routine blood investigations, special investigations like Uric acid, urinary albumin creatinine ratio, ECG,2D Echo, Carotid Doppler, CT Scan/MRI brain were done within24 hours of onset. NIHSS and MRS scores were used for severity assessment. Results: Majority of patients were in 55-64 years (30.4%) age group with male predominance (52%) (mean age 55.52±12.61). Old aged patients are more likely to be selected for study. Microalbuminuria was found on 34 (73.9%) Patients with recent stroke. 52.1 % patients having serum uric acid >8. 36.9 % patients, ECG suggested LVH and normal findings in 36.9% while 15.2% and 10.8% had stroke related changes and myocardial ischemia. Majority 30 (65%) of patients showed concentric hypertrophy, followed by diastolic dysfunction 11(23%) on 2D Echo. Atherosclerotic changes seen in 60.8% on carotid Doppler study. majority 32.6 % patients were affected in MCA territory, followed by 23.9 % PCA territory followed by 19.5% in thalamus. NIHSS and MRSmean score was 20.2± 12 and 3.9+1.8 on admission and 15.7±13 and 3.23+ 1.91 on discharge respectively. Hospital outcome was good. No mortality during entire study period. Conclusion: Stroke a high socioeconomic burden in community. Apart from Age and hypertension, microalbuminuria and uric acid may be considered as independent risk factors for ischemic stroke. Identification and treatment of risk factors can prevent stroke related morbidity and mortality.

Keywords: Ischemic cerebrovascular stroke, Atherosclerotic risk factors.

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Introduction

Stroke is defined as rapidly developing clinical signs of focal or global disturbance of cerebral function lasting for more than 24 hours with no obvious cause other than vascular origin.[1] A stroke or cerebrovascular accident defined by abrupt onset of a neurological deficit that is attributable to a focal vascular cause. Thus the definition of stroke is clinical and laboratory studies including brain imaging are used to support the diagnosis. Cerebral ischemia is caused by reduction in blood flow lasting for more than several seconds. If cessation of flow lasts for more than few minutes, infarction or death of brain tissue results.[2] In India, community survey has shown a crude prevalence rate of hemiplegia 200 per 1 lac persons, nearly 1.5% of all urban hospital admissions, 4.5 % of all medical and 20% of neurological cases.[3] Stroke incidence rises steeply with age; stroke in young is less common as compared to older but is of great concern due associated mortality and morbidity.[4] Stroke is second most common cause of disability and dementia in adults > 65 years worldwide; close to 25% stroke survivors develop dementia.[5] Thus stroke is an important cause of morbidity and long term disability.

Subjects and Methods

The study was conducted in department of medicine, Medical College and SSG Hospital, Vadodara during January 2014 to November 2014 after approval of medicine department and Institutional ethics committee. The study comprises of 46 patients with history and clinical features suggestive of acute ischemic cerebrovascular stroke admitted in Medicine wards applying inclusion and exclusion criteria. A Written Informed consent obtained from all patients.

Inclusion Criteria
a. Age> 25 yrs
b. First ever in time acute ischemic stroke within 72 hours of onset of symptoms
c. CT Scan evidence of Brain infarction within 24 hrs of onset of symptoms.

Exclusion Criteria
a. Past with h/o TIA/ Stroke
b. CT scan evidence of haemorrhage or other space occupying lesions other than infarction
c. known case of cardiac Diseases, Hypertension,
Diabetes Mellitus, Nephropathy
d. haematological abnormalities like leukemia, polycythemia or other myeloproliferative diseases
e. Neoplastic Disease
f. Connective tissue disorder
g. Systemic infections including Bacterial meningitis.
h. Prothrombotic states, Sickle cell Disease, Protein C/S deficiency,

Detailed clinical history obtained about symptoms. They were specifically asked for symptoms of headache, vomiting, vertigo, limb weakness, gait imbalance, speech disturbance, sensory symptoms, visual complaints among the other symptoms. Past and family history especially for risk factors (i.e hypertension, diabetes mellitus, ischemic heart disease and TIA/Stroke) and treatment for the same. All patients were evaluated for clinical examination mainly CNS. The severity of stroke assessed using NIHSS (National Institute of Health Stroke Score, De Graba, Hallenbeck. NIHSS and outcome 1999) for all the patients at admission with total score range from 0-42 with higher values representing more severe infarcts. The MRS (Modified Rankin Scale) was used to assess the outcome of patients (0-6). With higher the score, worse is the prognosis.

All the patients blood samples were taken within 24 hrs of admission for complete hemogram. Urine analysis, Random blood sugar, Renal and liver function tests, ECG, fundus examination, Carotid Colour Doppler, CT/ MRI scan examination, lipid profile, 2D Echo, USG KUB. Spot urine samples to measure the urinary albumin to creatinine ratio (ACR) obtained of all patients. A ratio of >0.3 is considered as normal while the value between 0.3 to 3.0 is considered as microalbuminuria. The patients with IFG or IGT were not included as diabetics in this study. All data were analysed using Microsoft excel software. Statistical analysis of data was performed in form of mean and standard deviation. t-test was applied to test statistically significant difference in groups. Two tailed P value <0.05 were considered significant.

**Results**

In our study, out of 46 patients, maximum numbers of patients were in 55-64 years (30.4%) of age with male predominance (52%) was observed.

| Table 1: Age distribution among the study population |
|----------------|--------|---------------|
| Age distribution (years) | Frequency | Percentage |
| 25 to 34 | 2 | 4.3 |
| 35 to 44 | 5 | 10.8 |
| 45 to 54 | 11 | 23.9 |
| 55 to 64 | 14 | 30.4 |
| 65 to 74 | 11 | 23.9 |
| 75 to 84 | 2 | 4.3 |
| >85 | 1 | 2.2 |
| TOTAL | 46 | 100 |

In our study, overall 34(74%) patients presented with hemiplegia, 56.5% patients presented with right hemiplegia, 17.5% with left hemiplegia, 10.9% with bilateral motor weakness while 13% presented with no motor weakness.

| Table 2: Distribution according to motor weakness |
|--------------------------|-------|----------|
| Limbs Involved | Frequency | Percentage |
| Hemiplegia | 34 | 74% |
| Bilateral | 5 | 10.9% |
| Monoplegia | 1 | 2.1% |
| No Motor weakness | 6 | 13% |
| Total | 46 | 100% |

In previous study, overall 36.9 % patients ECG suggested LVH and normal finding while 15.2% and 10.8% had stroke related changes and myocardial ischemia.

| Table 3: Distribution according to Microalbuminuria |
|----------------|-------|----------|
| Microalbuminuria | Frequency | Percentage |
| Present | 34 | 73.91% |
| Absent | 12 | 26.09% |
| Total | 46 | 100% |

| Table 4: Distribution according to Serum Uric Acid level |
|----------------|-------|----------|
| Serum Uric acid | Frequency | Percentage |
| <2 | 10 | 21.7 |
| 2 to 8 | 12 | 26 |
| >8 | 24 | 52.1 |
| Total | 46 | 100 |

In present study, carotid Doppler revealed atherosclerotic changes seen in 60.8% of ischemic cerebrovascular stroke.

| Table 5: Distribution according to ECG changes |
|----------------|-------|----------|
| ECG | Frequency | Percentage |
| Ischemic | 5 | 10.8 |
| LVH | 17 | 36.9 |
| Stroke related changes | 7 | 15.2 |
| Normal | 17 | 36.9 |
| Total | 46 | 100 |

Table shows the 2D Echo finding, where it was seen that majority 30(65%) of patients showed concentric hypertrophy, followed by diastolic dysfunction 11(23%) and 5 (12%) patients showed normal echocardiogram.

| Table 6: Distribution according to 2D ECHO |
|----------------|-------|----------|
| Findings | Frequency | Percentage |
| Concentric hypertrophy | 30 | 65% |
| Diastolic dysfunction | 11 | 23% |
| Normal | 5 | 12% |
| Total | 46 | 100 |

| Table 7: Distribution according to Carotid Colour Doppler findings |
|----------------|-------|----------|
| Carotid Colour Doppler | Frequency | Percentage |
| Atherosclerotic changes | 28 | 60.8 |
| Normal | 18 | 39.2 |
In our study, majority 32.6% patients were affected in MCA territory, followed by 23.9% PCA territory followed by 19.5% infarct in thalamus, followed by 13% in internal capsule while 8.6% and 2.2% seen in both caudate nucleus and cerebellum.

Furthermore, 17 out of 19 patients with NIHSS Score more or equal to 10 had microalbuminuria while only 2 patients did not have microalbuminuria. NIHSS mean score was 20.2±12 on admission and 15.7±13 on discharge with p value less than 0.05 significant. Furthermore, the presence of microalbuminuria with higher score represent poor prognosis as compared to absent microalbuminuria.

In our study, 20 patients had NIHSS Score more than 10. and NIHSS Score on admission. The presence of microalbuminuria is associated with higher NIHSS Score, thus suggest poor outcome. P value was less than 0.05 indicating significant correlation between microalbuminuria and NIHSS Score on admission. In our study, 20 patients had NIHSS Score more than or equal to 10 had microalbuminuria with p value less than 0.05. Thus, the presence of microalbuminuria in our study correlates well with above studies.

In our study, NIHSS mean score was 20.2±12 on admission and 15.7±13 on discharge with p value less than 0.05 significant. Furthermore, 17 out of 19 patients with NIHSS Score more or equal to 10 had microalbuminuria while only 2 patients did not have microalbuminuria. NIHSS mean score was 20.2±12 on admission and 15.7±13 on discharge with p value less than 0.05 significant. 17 patients had NIHSS Score more than or equal to 10 had microalbuminuria with p value less than 0.05. Thus, the presence of microalbuminuria in our study correlates well with above studies.

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progression in patients with acute ischemic infarct can be a valuable asset in future attempt to assess the therapeutic intervention. It can provide a guide to expected outcome when considering subject inclusion and sample size in therapeutic trials. Additionally it can provide insight into potential ongoing injury that occur after the initial ischemic insult.

Conclusion

Our study confirms that age and hypertension are important atherosclerotic risk factors for ischemic cerebrovascular stroke. Hypertension being one of the major risk factor leading to stroke also supported by evidence on Electrocardiogram and 2D Echocardiography . Even serum uric acid and Microalbuminuria may be considered as leading risk factors for cerebrovascular stroke. 

Our study demonstrated potential value of NIHSS and MRS score in identifying those patients who are likely to progress as well as improving compared on admission and discharge. This can provide new window to deliver therapies targeting these sequel of ischemia.

Limitation of Study

1. The study has not included those patients whose prognosis might have too poor to reach hospital on time or good enough with minimal impairment to seek medical consultation at tertiary care centre.
2. The large study sample size is ideally required for the statistical significance of the results,their implications and validity to extrapolate result and to suggest recommendation on the basis of same.
3. The study involved only short term follow up hence long term prognosis can be more justified for Prognostification

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