STUDY OF RISK FACTORS AND CLINICAL PROFILE OF ACUTE STROKE
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Abstract: Introduction: Stroke is the third leading cause of death in developed countries after cardiovascular disease and cancer. In India, Community Surveys have shown a crude prevalence rate for hemiplegia 200 per 1,00,000 population. It accounts for nearly 1.5% of all urban admissions, 4.5% of all medical and about 20% of neurological cases. Aims and Objective: Identification of risk factors and evaluation of clinical profile of acute stroke. Material and Method: Inclusion criteria: Cases of acute stroke admitted in SGMH hospital were selected for the study. Exclusion criteria: Brain injury cases, infective, neoplastic cases producing stroke were excluded. Results: Stroke was more common in male, 58% patients were male and 42% patients were female. It was more common in 5th and 6th decade. Most common etiology was infarction. Most common risk factor was hypertension followed by smoking. In addition to limb weakness, headache and vomiting were most common presenting symptoms followed by convulsion. These symptoms were more common in hemorrhagic stroke. Right sided hemiplegia was more common than left sided. Middle cerebral artery was involved in majority of cases in atherothrombotic stroke whereas basal ganglion was most common site of bleed in hemorrhagic stroke. Coma and mortality were more in hemorrhagic stroke. Conclusion: The risk factors and clinical profile of acute stroke in India are similar to that of Western countries. Common risk factors are hypertension, smoking, diabetes mellitus and hyperlipidemia.

Keywords: Risk factors, Stroke.

Introduction: Cerebrovascular disease has been defined by WHO as a neurological dysfunction with symptoms lasting more than 24 hours or resulting in death before 24 hours and in which after adequate investigations, symptoms are presumed to be of a non-traumatic vascular origin.¹ It is the third leading cause of death in developed countries after cardiovascular disease and cancer.² Among all strokes ischemic stroke/TIA is responsible for 80% and hemorrhage accounts for 15% of cases whereas subarachnoid hemorrhage and hypertensive ICH is responsible for 4% and 7% cases respectively. In India Community Surveys have shown a crude prevalence rate for hemiplegia in range of 200 per 1,00,000 population. It accounts for nearly 1.5% of all urban admissions, 4.5 percent of all medical and about 20% of neurological cases.² The incidence of stroke worldwide is 179 per 1,00,000 population in various parts. In Western countries overall prevalence rate is 794 per 1,00,000 population. The annual incidence of stroke in UK is about 350 per 1,00,000 population and in USA they cause 2,00,000 deaths per-year.³⁴

Aims and Objective: Identification of risk factors and evaluation of clinical profile of acute stroke. The study comprised of 100 patients admitted in S.S. Medical College & associated S.G.M. Hospital Rewa, from May 2009 to Sept 2011.

Material and Method:
INCLUSION CRITERIA: Cases of acute stroke admitted in SGMH hospital were selected for the study.

EXCLUSION CRITERIA: Brain injury cases, infection, neoplastic cases producing stroke were excluded. Stroke in less than 20 year of age were excluded from study.

After admission a detailed history regarding the temporal profile of stroke including history of risk factors like hypertension, diabetes mellitus, smoking, history of CAD and rheumatic heart disease were obtained. Detailed neurological examination including fundoscopy and other systemic examination was carried out in all cases. The diagnosis of stroke was made on the basis of temporal profile of clinical syndrome, clinical examination, and CT scan of brain.

RESULTS:

| Age (years) | Male | Female | Total | Percent |
|-------------|------|--------|-------|---------|
| 21-30       | 2    | 1      | 3     | 3.00    |
| 31-40       | 6    | 4      | 10    | 10.00   |
| 41-50       | 15   | 5      | 20    | 20.00   |
| 51-60       | 16   | 11     | 27    | 27.00   |
| 61-70       | 14   | 14     | 28    | 28.00   |
| 71-80       | 4    | 4      | 8     | 8.00    |
| 81-90       | -    | 2      | 2     | 2.00    |
| 91-100      | 1    | 1      | 2     | 2.00    |
| Total       | 58   | 42     | 100   | 100.00  |

Table 1: Age and sex distribution in stroke patients

| Risk Factors (n-72) | No. of Cases | Percent |
|---------------------|--------------|---------|
| No risk Factor (n-28) | 28           | 28.0    |
| Risk Factors        |              |         |
| a. Hypertension     | 45           | 62.5    |
| b. DM                | 13           | 18.05   |
| c. Smoking           | 28           | 38.88   |
| d. Hyperlipidemia    | 8            | 11.11   |

Table 2: Incidence of Risk Factors in stroke patients
Type of Stroke | Male | Female | Total | Percent |
---|---|---|---|---|
| No | % | No | % | |
| Ischemic stroke | 35 | 51.47 | 33 | 48.33 | 68 | 68.00 |
| Hemorrhage stroke | 19 | 59.37 | 13 | 40.63 | 32 | 32.00 |
| Total | 54 | 46 | 100 | 100.00 |

Table 3: Incidence of Infarct & Hemorrhage with reference to sex

Table: 3

| Clinical Features | Ischemic (n=68) | Hemorrhage (n=32) |
| --- | --- | --- |
| No | % | No | % |
| Headache | 17 | 25.00 | 21 | 65.62 |
| Vomiting | 13 | 19.11 | 25 | 78.12 |
| Convulsions | 6 | 8.82 | 4 | 12.50 |
| Right side hemiplegia | 47 | 69.1 | 22 | 68.75 |
| Left side hemiplegia | 21 | 30.80 | 10 | 31.25 |
| Conscious | 38 | 55.80 | 6 | 18.75 |
| Drowsy | 12 | 17.50 | 2 | 6.25 |
| Coma | 18 | 26.47 | 24 | 75.00 |

Table 4: Clinical features in study group

| TERRITORY | TOTAL | % |
| --- | --- | --- |
| Frontal | 8 | 11 |
| Temporal | 15 | 22 |
| Parietal | 20 | 29 |
| Occipital | 3 | 4.4 |
| Internal capsule | 6 | 9 |
| Basal ganglia | 11 | 16 |
| Thalamus | 3 | 4.4 |
| Cerebellum | 2 | 3 |

Table 5: Infarct distribution
Table 6: Distribution of hematomas

| TERRITORY    | NO | %  |
|--------------|----|----|
| Thalamus     | 8  | 21 |
| Basal ganglia| 18 | 47 |
| Pons         | 1  | 2.6|
| Cerebellar   | 2  | 5.2|
| Internal capsule | 1 | 2.6|
| Cortical     | 1  | 2.6|
| SAH          | 7  | 18.4|

Table 7: Patients of stroke who died

| Type of stroke      | No. of died patients (n-22) | Percentage |
|---------------------|-----------------------------|------------|
| Ischemic            | 9                           | 40.00      |
| Hemorrhagic         | 13                          | 59.00      |

Table 8: 2D Echo changes in stroke patients

| ECHO changes               | Ischemic (n-68) | Hemorrhage (n-32) |
|----------------------------|-----------------|-------------------|
|                            | Normal | Abnormal | Normal | Abnormal |
| No | %  | No | %  | No | %  | No | %  |
|-----|-----|-----|-----|-----|-----|-----|-----|
| LV dysfunction              | 52     | 76.47| 16   | 23.53| 14   | 43.75| 18   | 56.26|
| LA thrombus                 | 68     | 100.0| -    | -    | 32   | 100.0| -    | -    |
| Mitral valve abnormality    | 54     | 79.41| 14   | 20.59| 32   | 100.0| -    | -    |
| Aortic valve abnormality    | 65     | 95.58| 3    | 4.41 | 32   | 100.0| -    | -    |
| Normal                      | 30     | 44.11| 38   | 55.88| 24   | 75.0 | 8    | 25.0 |

LV dysfunction was most common echocardiographic abnormality which was more common in hemorrhagic stroke.

DISCUSSION: A hospital based cross sectional study was done to know the clinical features and risk factors of stroke patient. Among the 100 patients 58 were males and 42 were females (sex ratio was M:F-1.4:1), age ranged from 24-92 years and the mean age of patients of alive and dead were 58.73 and 54 years respectively. The cases of stroke were more common in the 5th and 6th decade, making 55%, which is comparable to Venkataramana et al (1977) study in which the percentage of stroke cases above the age of 51 years was 41% and in the Carlo study (2003) was 71.8%.

Study group

| Incidence of stroke | Venkataraman et al (1977) | Carlo et al (2003) | Present study |
|---------------------|---------------------------|--------------------|---------------|
| Incidence of stroke | 41%                       | 71.8%              | 55%           |

Comparison of Incidence of Stroke Patients above age group of 51 years

Stroke is one of the leading causes of death in many countries. Although there was a lack of
unanimity, several factors have been reported to increase the risk of stroke. Reports from different countries have implicated different factors associated with high risk of stroke. To evaluate the risk factors, a prospective survey of a given population of the years as done in the Framingham Study was essential. The only epidemiological study of Abraham et al (1970) who found hypertension, diabetes mellitus, hypercholesterolemia and syphilis to be the risk factors associated in hemiplegia patients. Shaper et al in 1991 concluded that, hypertension, cigarette smoking and pre-existing IHD was found to be the major risk factors.

| Risk factors      | Smith (2005) (%) | Carlo et al (2003) (%) | Present Study (%) |
|-------------------|------------------|------------------------|-------------------|
| Hypertension      | 87.00            | 48.00                  | 62.5              |
| Diabetes mellitus | 50.00            | 20.90                  | 18.05             |
| Smoking           | 35.22            | --                     | 38.88             |
| History of stroke | 39.30            | 12.50                  | --                |
| Hyperlipidemia    | 22.95            | --                     | 11.11             |

Comparison of association of risk factors in different studies

In the present study, risk factor was found in 72% cases while no risk factor was found in 22% cases. Hypertension was present in majority of the cases i.e., 62.5%, which is comparable with that found in the studies of Smith (2005) and Carlos (2003) i.e., 87% and 48% respectively and next commonest risk factor was smoking (38.88%) which are comparable with that found in Smith (2005) i.e., 35.22% and 39.30% and diabetes mellitus was present in 18.05% of the patients in the present study and the least was hyperlipidemia.

| Clinical features | Mohr et al (1978) (%) | Foulkes et al (1988) (%) | Present Study (%) |
|-------------------|------------------------|--------------------------|-------------------|
| Headache          | 36.00                  | 41.00                    | 38.00             |
| Vomiting          | 44.00                  | 49.00                    | 38.00             |
| Convulsions       | 7.00                   | 9.00                     | 10.00             |

Comparison of Clinical Features in Patients with Stroke

In the present study, headache was present in 38% of the cases, which is comparable to the series of Mohr et al (1978), who reported an incidence of 26%. Foulkes et al (1988) reported severe headache in 41% of cases. Vomiting was present in 38% of our patients, which is comparable to Mohr et al (44%), Foulkes et al (1988), who reported frequency of headache in 49% of the cases. Convulsions in the present series were present only in 10% of the total patients, which is comparable to that of Mohr et al (1978) and Foulkes et al, who reported frequency of 7% and 9% respectively.
In this study, 68% of the patients has ischemic stroke, which was comparable with that found in the studies of Daniele et al, Roy et al and Mikolich et al (1981) i.e., 78.20%, 71.00% and 93.33% respectively. 32% had stroke in the present study comparable with 21.80%, 29% and 6.66% in the Daniele et al (2002), Roy et al (1995) and Mikolich et al study group. In this study MCA, ACA, and PCA territory was involved in 60%, 11%, 29% cases respectively. Most common site of hematoma in hemorrhagic stroke was basal ganglia. LV dysfunction was most common echocardiographic abnormality which was more common in hemorrhagic stroke and it was significantly correlated with mortality in hemorrhagic stroke.

**SUMMARY:** Stroke was more common in male, 58 % patients were male and 42% patients were female. Stroke was more common in the 5th and 6th decade. The mean age was 56yrs. Among the strokes most common etiology was infarction which comprised 68 % of patients followed by hemorrhage which comprised of 32% patients. Young stroke were 13% (age <40yrs). Most common risk factor was hypertension followed by smoking. In the present study, hypertension, smoking, past history of stroke, diabetes mellitus, and hyperlipidemia was present in 45%, 28%, 22%, 13% and 8% of cases respectively.

In addition to limb weakness headache and vomiting were most common presenting symptoms followed by convulsion, which were present in 38%, 38%, 8% cases respectively, all these symptoms were more common in hemorrhagic stroke. Right sided hemiplegia was more common. Coma was more common in hemorrhagic stroke. MCA territory was involved in majority of cases in infarct group whereas basal ganglion was most common site of bleed in cases of hemorrhagic group. Mortality was more in hemorrhagic stroke (59%) than atherothrombotic stroke (40%).

**CONCLUSION:** The risk factors and clinical profile of acute stroke patient in India are similar to that of Western countries. Common risk factors are hypertension, smoking, diabetes mellitus and hyperlipidemia. So it is strongly recommended that there should be strict control of blood pressure, diabetes, hyperlipidemia and cessation of smoking for prevention of stroke.

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