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**RESEARCH ARTICLE**

# RISK FACTORS FOR STROKE IN KASHMIR VALLEY.

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## *Abstract*

**Background:** Stroke is usually end result of predisposing conditions that originated years before the ictus. Identification of its risk factors can help in planning preventive strategies.

**Objective:** To study the risk factor profile of stroke and impact of various risk factors on outcome of stroke.

**Methodology:** A hospital based descriptive study was conducted at SMHS hospital, Srinagar (J&K) a tertiary care teaching institute between May 2011 to December 2012, in which 503 patient who presented to hospital with clinical features of stroke confirmed by brain imaging were included. Patients were then investigated for presence of conventional risk factors and their impact on mortality and functional outcome were noted.

**Results:** The age of most stroke patients was between 50-60 years. It afflicted higher percentage of males (64%) than females (36%) and stroke subtypes showed preponderance of haemorrhagic stroke in 280 (55.7%) as against ischemic stroke 223 (43.3%). Hypertension was the most common risk factor in 411 patients (81.7%) followed by smoking in 320 (63.3%), dyslipidemia in 128 (25.4%), diabetes mellitus in 51 (10.1%), heart disease in 42 (8.3%), carotid thickness in 33 (6.6%), past history of stroke in 36 (7.2%), family history of stroke in 14 (2.8%), obstructive sleep apnea in 23 (4.6%), hormonal treatment in 17 (3.4%), use of tranquilizers in 9 (1.8%), claudication in 4 (0.8%). Mortality rate was 20.9% and most of the patients (50.8%) at discharge were dependent on others as per Oxford Handicap Scale. Low GCS, fever and delayed presentation (>24 hours) to hospital were associated with poor outcome.

**Conclusion:** The maximum occurrence of stroke was seen in patients >60 years. Overall male preponderance and higher occurrence of haemorrhagic stroke was seen in our study which may be attributed to presence of single or multiple risk factors.



## Introduction:-

Several population based epidemiological studies have focused on identification of risk factors for stroke. The Framingham profile consisting of accelerated systolic blood pressure, serum cholesterol, glucose intolerance, cigarette smoking and left ventricular hypertrophy identifies persons at higher risk of stroke. The risk factors for stroke vary internationally and profile may differ in different population groups. Detailed assessment of the underlying risk factors in stroke population of a country is relevant to understanding aetiology and planning preventive strategies to reduce stroke burden. The present hospital based study was performed to study the risk factor profile of stroke in Kashmir and to study the impact of various risk factors on outcome of stroke[1].

## Material and methods:-

This was a descriptive hospital based study conducted in the Department of Medicine, Government SMHS Hospital Srinagar (J&K), a teaching hospital from May 2011 to September 2012. 503 patients who presented with stroke were included. Patients who had brain tumor, meningoencephalitis, traumatic intracranial bleed, subdural haematoma, extradural haematoma, acute disseminated encephalomyelitis and metabolic encephalopathy were excluded from the study.

Detailed clinical history was obtained and clinical examination performed as per standard proforma. Blood haemogram, sugar, urea, creatinine, electrolytes, lipid profile, 12 lead ECG and CT brain was performed in all the cases. Echocardiography, carotid Doppler, CT angiography, MRI angiography, protein C and protein S, antithrombin III, ANA, antiphospholipid antibody were done in selected patients.

The patients who survived were reassessed at the time of discharge. The degree of morbidity was calculated as per Oxford Handicap Scale, wherein score ranges from 0-5.

**Statistical Analysis:-**

The data was processed by SPSS statistical software using chi-square test and p-value. A p value of $< 0.05$ was taken as statistically significant.

## Results:-

There were total of 305 patients included in the study of which 322 (64%) were males and 181 (36%) were females. Most of the patients belonged to $5^{th}$ to $6^{th}$ decade of life. Out of 503 patients studied, 44.3% had ischemic stroke and 55.7% had haemorrhagic stroke. Amongst the modifiable risk factors hypertension was seen in 411 (81.7%) and constituted largest risk factor followed by smoking in 322 (63.6%), dyslipidemia in 128 (25.4%), diabetes mellitus in 51 (10.1%), heart disease in 42 (8.3%), carotid thickness in 33 (6.6%), past history of stroke in 36 (7.2%), family history of stroke in 14 (2.8%), obstructive sleep apnea in 23 (4.6%), hormonal treatment in 17 (3.4%), use of tranquilizers in 9 (1.8%) and claudication in 4 (0.8%).

**Table 1: Presence of Risk Factors**

| Risk Factors | No. of Patients | Percentage |
|---|---|---|
| Hypertension | 411 | 81.7 |
| Smoking | 320 | 63.3 |
| Dyslipidemia | 128 | 25.4 |
| Diabetes mellitus | 51 | 10.1 |
| Heart disease | 42 | 8.3 |
| Carotid thickness | 33 | 6.6 |
| Past history of stroke | 36 | 7.2 |
| Family history of stroke | 14 | 2.8 |
| Obstructive sleep apnea | 23 | 4.6 |
| Hormonal treatment | 17 | 3.4 |
| Use of tranquilizers | 9 | 1.8 |
| Claudication | 4 | 0.8 |
| Alcohol | 0 | 0.0 |

In our study 105 (20.9%) patients died during the hospital stay of 1-2 weeks and 398 (79.1%) patients survived, 49.2% of those who survived were independent and 50.8% were dependent at the time of discharge as per Oxford Handicap Scale.

| Table 2: Outcome at Discharge | | | |
|---|---|---|---|
| **Risk Factors** | | **No. of Patients** | **Percentage** |
| Outcome | Died | 105 | 20.87 |
| | Survived | 398 | 79.13 |
| Oxford Handicap Scale | Motor symptoms not interfering with life style | 56 | 14.07 |
| | Minor handicap | 71 | 17.83 |
| | Moderate handicap | 111 | 27.88 |
| | Moderately severe handicap | 88 | 22.11 |
| | Severe handicap | 72 | 18.08 |
| Status | Independent | 195 | 49.2 |
| | Dependent | 203 | 51.8 |

From multivariate analysis, low GCS (<8), fever, delayed presentation (>24 hours) to hospital were associated with poor outcome.

| | | Died | | Survived | | p value |
|---|---|---|---|---|---|---|
| | | No. | % | No. | % | |
| GCS | <8 | 17 | 51.5 | 16 | 48.5 | 0.000 Sig. |
| | >8 | 88 | 18.7 | 382 | 81.3 | |
| Temperature | Febrile | 67 | 28.9 | 165 | 71.1 | 0.000 Sig. |
| | Afebrile | 38 | 14.0 | 233 | 86.0 | |
| Duration | <24 hours | 94 | 19.5 | 389 | 80.5 | 0.000 Sig. |
| | >24 hours | 11 | 55.0 | 9 | 45.0 | |

## Discussion:-

In our study male patients were more than the female patients. Studied by Hasan SR[2] and Razdan S et al[3] also found almost matching sex distribution of stroke. Majority of our patients had haemorrhagic stroke (55.7%) as compared to ischaemic stroke (44.3%) which was almost consistent with the study conducted by Maskey et al[4] in contrast to the study by Asgar Kamal et al[5] where they found ischaemic stroke more common than haemorrhagic. Hypertension, smoking, diabetes and dyslipidemia were the most important risk factors associated with stroke which was consistent with the studies by Hasan SR[2], Asgar Kamal[5] and Haque MM[6]. A case of stroke was found secondary to disseminated intravascular coagulation following septic abortion and another case was admitted as ischaemic stroke with APLA syndrome.

Mortality rate in our study was 20.9% which was almost similar with the study by Hasan SR[2]. In our study we correlated various risk factors with outcome at the time of discharge. In univariate analysis the factors which were significant included age, diabetes, dyslipidemia, fever, aspiration pneumonia, delayed presentation to hospital, low GCS. These significant risk factors were subjected to multivariate analysis. From that analysis, fever, low GCS and delayed presentation were the significant factors. Similar results were observed in the study by Atadzhanow M[7].

In our study we looked for the correlation between risk factors and stroke. We found that haemorrhagic stroke were more common in <65 years of age, male sex (63.7%), thin and average built people and people with hypertension, where as ischaemic strokes were more common in people with >65 years of age, females (58.6%), obese people. Diabetes, dyslipidemia, heart disease, atherosclerotic plaque of common carotid artery, claudication, use of tranquilizers, wee associated with ischaemic stroke and rest of the factors were not statistically significant. Almost similar results were obtained by Zhang J et al[8] and Anderson KK et al[9].

## Conclusion:-

It is concluded that haemorrhagic stroke is more common in valley and this may be attributed to presence of single or multiple risk factors. Educating masses and treating these risk factors aggressively can help in reducing morbidity and mortality of stroke patients.

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