Study to Evaluate the Risk Factors in Patients with Ischemic Stroke in S.V.R.R.G.G.H. Tirupati.

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Abstract

Introduction

Stroke is a leading public health problem, it is second to heart disease as a worldwide cause of death and a leading cause of long term disability. The treatment of patients with ischaemic stroke is still not very effective and prevention of stroke is a better option. The incidence of stroke can be reduced by adequate control of risk factors. This study intends to the assess the most common risk factors in patients with ischaemic stroke and their prognosis. It aims to help in treating these risk factors to reduce the incidence of stroke in the population.

Methods: *130 patients with ischaemic stroke who met the inclusion criteria were evaluated with a comprehensive clinical history and detailed physical examination and relevant investigations. Their prognosis during the hospital stay was also determined.*

Results: *At the end of the study it was noted that the incidence of stroke in males was 58.4%.*

50.9% of stroke occurred in people aged above 60 years. The most common risk factors were smoking (46.2%), hypertension (38.46%), dyslipidemia (18.46%) alcohol consumption (15.39%), diabetes mellitus (13.09%), heart diseases (10.7%), tobacco chewing (9.23%), history of recent delivery (1.6%) and family history of stroke (1.6%). It was also noted that 72.3% of patients had multiple risk factors of which 7% had a complete recovery while 22.2% of patients with single risk factors had a complete recovery.

Conclusion: *It was found that stroke was more common in males when compared to females and increasing age (>60 years) was associated with increased incidence of stroke.*

Most common modifiable risk factors were smoking, hypertension, dyslipidemia, alcohol consumption and diabetes mellitus. The most common non modifiable risk factors were increasing age, male sex and family history of stroke. Prognosis depends on the number of risk factors present.

It was also found that increasing age, hyperglycaemia and multiple risk factors were associated with poor prognosis.

I. Introduction

Ischemic Cerebrovascular disease (ischaemic stroke) is a leading public health problem. Every 53 seconds, someone in the United States has a stroke. Annually, approximately 750,000 Americans have an initial or recurrent ischaemic stroke. Stroke incidence is even higher in most other countries. Rates are particularly high in Asia and Eastern Europe. Changes in the rates of stroke vary considerably among regions; for example, the incidence of stroke is declining in Western Europe and North America while it is rising in Eastern Europe. Although definitive data from many third-world countries are not available, stroke likely is a major health care problem in these nations. Stroke is a rising problem in the developing world. With the advancing life expectancy of people in developing countries, the importance of ischaemic stroke will grow as a worldwide problem.[1,2]

For India, community survey have shown a crude prevalence rate for hemiplegia in the range of 200 per 100000 persons, nearly 1.5 percent of all urban hospital admission, 4.5% of all medical and around 20% of all neurological cases.[3] Stroke is second to heart disease as a worldwide cause of death. In the United States, stroke is the third most common cause of death, following heart disease and cancer. Annually, 150,000 Americans die of stroke, and it contributes to the death of another 140,000 people.[1]

Since the late 1990s, there has been an increase in survival after stroke and, therefore, it has become a common cause of human suffering and the leading cause of long-term disability. A stroke often precludes patients' abilities to return to work or to regain their role in a family. Thus, by affecting both patients and loved ones, stroke is a family illness. Family relationships and dynamics often are changed irrevocably. Disability may require a spouse or other relative to assume a new role or become a full-time caregiver. Stroke is second only to dementia as a neurological disorder leading to long term institutionalized care. Recurrent stroke produces

dementia, and its effects exacerbate cognitive impairments from degenerative dementias, such as Alzheimer's disease.[1]

Due to the high incidence of stroke and the high costs expended for each individual patient, it accounts for a sizeable amount of the health care costs. Thus, stroke and its sequelae are important issues for health care planners in governments, insurance companies, and medical services everywhere. Because the costs of treatment and the economic consequences of lost productivity are so great, prevention of stroke will be a very cost effective strategy. In view of the increasing incidence, high health care costs and the potential for prevention of stroke a current study was undertaken to identify the risk factors.

Patients and Methods

The present study included patients with ischaemic stroke who were admitted in the medical wards and intensive care unit under the Department of Medicine at Sri venkateswara Ram Narain Ruia general hospital, Tirupati during may 2017 to april 2018. Informed consent was taken before enrolment. Sixty five patients were enrolled for the study. The criteria for selection of patients were as follows

Inclusion Criteria
Patients with the evidence of ischaemic stroke.
Ischaemic stroke is diagnosed if the following criteria are present :
1. Symptoms and signs suggestive of acute loss of focal or global cerebral function.
2. Evidence of ischaemia on CT scan of brain.

Exclusion Criteria
1. Patients with focal epilepsy, migraine, and structural brain lesions (such as tumors).
2. Patients with evidence of haemorrhage on CT scan of head.
3. Stroke secondary to infection and connective tissue disorders.

Only the patients who met the above inclusion criteria and did not have any exclusion criteria were included in the study.
The patients enrolled in the study were subjected to a detailed clinical history and physical examination. Clinical history was obtained from the attenders when the patient was having speech disturbances. The following investigations were carried out as part of the study.
• Complete blood count.
• Urine analysis
• Fasting blood sugar / post prandial blood sugar.
• Blood urea.
• Serum creatinine
• Lipid profile
• Electro cardiogram (ECG)
• 2D-Echo with colour doppler
• Computed Tomography (CT Scan)

The prognosis was studied with regard to the outcome during the Hospital stay and was classified as follows based on Barthel score:
• Complete recovery
• Partial recovery
• No recovery (No improvement)
• Death

The risk factor profile of each patient was evaluated during the stay. In the study
• Hypertension was defined as a BP recording of >140/90 mmHg on 3 separate occasions, taken on 3 different days. Patients who are already on antihypertensive medications were also taken as hypertensive.
• Dyslipidemia was taken as serum cholesterol >200mg/dl, LDL cholesterol >130mg/dl and HDL cholesterol <35mg/dl in females and <40mg/dl in males.
• Patients were included as suffering from heart diseases if they had ischemic heart disease, congestive heart failure, rheumatic heart disease, atrial fibrillation or evidence of left ventricular hypertrophy on ECG or Echocardiography.
• Smoking, tobacco chewing and alcohol intake were based on the clinical history of past and present consumption of these substances.

- Diabetic patients were diagnosed as per the American diabetic association guidelines. Patients on antidiabetic medications were also considered as diabetics.
- A family history of stroke was entertained if the first degree relatives of the patients suffered from stroke.
- Patients were considered as obese if their BMI was ≥ 30.

II. Results

In the present study 65 cases of acute ischaemic stroke who met inclusion and exclusion criteria were analyzed with regards to the risk factors, individually and in combination and they were correlated with the outcome.

Table1: Sexdistribution

	Total	Expired	Complete Recovery	Partial Recovery	No Recovery
Male	76 (58.46%)	8 (10.52%)	12 (15.78%)	32(42.12%)	24 (31.57%)
Female	54 (41.54%)	8 (14.81%)	6 (11.11%)	16 (29.62%)	24 (44.44%)

Table 2: Age distribution

Age in years	Total	Expired	Complete Recovery	Partial Recovery	No Recovery
20-29	8 (6.15%)	0	4 (50%)	2 (25%)	2 (25%)
30-39	12 (9.23%)	0	2 (16.60%)	8 (66.66%)	2 (16.66%)
40-49	18 (13.84%)	4 (22.22%)	4(11.11%)	6 (33.33%)	6 (33.33%)
50-59	26 (20%)	2 (7.71%)	2 (7.71%)	14 (53.93%)	8 (30.74%)
60-69	44 (33.85%)	6 (13.63%)	8 (18.18%)	12 (27.17%)	18 (40.98%)
□70 yrs	22 (16.92%)	4 (18.18%)	0	6 (27.28%)	12 (54.54%)

Table 3: Risk factors in the study

Risk factors	No. of patients	Percentage
Hypertension	50	38.46
Diabetes mellitus	18	13.09
Smoking	60	46.2
Tobacco chewing	12	9.23
Dyslipidemia	24	18.46
Alcohol	20	15.39
Heart diseases	14	10.76
History of Recent delivery	2	1.6
Family history stroke	2	1.6

Among 65 patients 25 (38.46%) patients had hypertension, 30 patients (46.20%) were smokers, 6 patients (9.23%) chewed tobacco, 12 patients (18.46%) had dyslipidemia, 9 Patients 13.09% had diabetes mellitus, 10 patients (15.39%) had alcoholism, 7 patients (10.76%) had heart diseases 1 patient (1.6%) had recent delivery and 1 patient (1.6%) had family history of stroke.

Table 4: HYPERTENSION AS RISK FACTOR

	Total		Expired		Complete Recovery		Partial Recovery		No Recovery	
	No.	%	No.	%	No.	%	No.	%	No.	%
No. of cases with history of hypertension	50	38.46	6	12	6	12	22	44	16	32
No. of cases without history of hypertension	80	61.5	10	12.5	12	15	26	32.5	32	40

Table 5: DIABETES MELLITUS AS RISK FACTOR

	Total	Expired		Complete Recovery		Partial Recovery		No Recovery	
		No.	%	No.	%	No.	%	No.	%
No. of cases with diabetes	18	4	22.22	0	0	6	33.33	8	44.44
No. of cases without diabetes	112	12	7.71	18	16.7	42	37.5	40	35.71

Table 6: SMOKING AS RISK FACTOR

	Total	Expired		Complete Recovery		Partial Recovery		No Recovery	
		No.	%	No.	%	No.	%	No.	%
Smokers	60	4	6.60	10	9.25	26	43.33	20	33.33
Non Smokers	70	12	17.14	8	11.42	22	31.42	28	40

Table 7: DYSLIPIDEMIA AS RISK FACTOR

	Total		Expired		Complete Recovery		Partial Recovery		No Recovery	
	No.	%	No.	%	No.	%	No.	%	No.	%
No. of cases with Dyslipidemia	24	18.46	6	25	0	0	10	41.66	8	33.33
No. of cases without Dyslipidemia	106	81.54	10	9.43	18	16.98	38	38.84	40	37.33

Table 8: ALCOHOL AS RISK FACTOR

	Total	Expired		Complete Recovery		Partial Recovery		No Recovery	
		No.	%	No.	%	No.	%	No.	%
No. of cases with Alcohol consumption	20	2	10	4	20	10	50	4	20
No. of cases without Alcohol consumption	110	14	12.72	14	12.72	38	34.54	44	40

Table 9: MULTIPLE VS SINGLE RISK FACTORS

	Total	Expired		Complete Recovery		Partial Recovery		No Recovery	
		No.	%	No.	%	No.	%	No.	%
No. of cases with risk factors >1	94	12	12.76	10	7	40	30.76	32	34.04
No. of cases □ 1 risk factors	36	4	11.11	8	22.22	8	22.22	16	44.44

Among 65 patients, 47 patients (72.3%) had multiple risk factors like age □ 60 years, hypertension, smoking, diabetes etc. among these, 6 patients (12.76%) expired, 16 patients (34.04%) had no recovery, 20 patients (30.76%) had partial recovery and 5 patients (7%) had complete recovery.

Among the 18 patients (27.6%) who had one or no risk factors 2 patients (11.11%) expired, 4 patients (22.22%) had complete recovery, 4 patients (22.22%) had partial recovery and 8 patients (44.44%) had no recovery.

Table 10: PRESENTING SYMPTOMS

Symptoms	No. of patients	Percentage
Unconsciousness	20	15.4
Motor weakness	98	75.39
Sensory disturbance	0	0
Speech disturbance	40	30.7
Headache	18	13.85
Vomiting	4	3.07
Convulsions	4	3.07
Fever	0	0

III. Discussion

Stroke especially ischaemic is a common clinical problem, current treatment for patients with established stroke is relatively ineffective. Approximately 50% of patients are left with permanent disability. Effective risk factor intervention offers a real hope of reducing stroke morbidity and mortality. Certain risk factors have been consistently identified as significant predictor of stroke outcome, while some are less consistent.In the present study which involved 130 patients of ischaemic stroke admitted in the ICU attached to our institute, we examined the prediction of stroke outcome in relation to sex, age, smoking, tobacco chewing, hypertension, heart disease (valvular heart diseases, coronary artery diseases, atrial fibrillation etc), diabetes, dyslipidemia and obesity. It was consistent with previous published studies, smoking, hypertension and dyslipidemia were the most common risk factors

Table 11: RISK FACTORS IN VARIOUS OTHER STUDIES

Risk factors	Bansal[4] study (%)	Feigin[2] study (%)	Shridharan[5] study (%)	Present study (%)
Hypertension	56.4	84.8	38.7	38.46
Diabetes	22.1	7.2	29.4	13.09
Smoking	38.6	19.4	22.5	46.2
Tobacco chewing	7.8	-	-	9.23
Dyslipidemia	8.8	-	-	18.46
Alcohol	15	-	14.7	15.39
Heart diseases	22.9	39.2	29.9	10.76
Recent delivery	-	-	-	1.6
Family history of stroke	27	18.1	-	1.6
Obesity	-	27.9	-	-

Prognosis

Hyperglycemia is an adverse prognostic factor. In the present study of the 18 diabetic patients there are 8 diabetic patients (44.44%) who had no recovery, 6 patients (33.33%) had partial recovery. This was consistent with Copenhagen stroke study.[6]

Increasing age was also an adverse prognostic factor with 18 patients (40.98%) in the age group 60-69 years and 12 patients (54.54%) in the age group >70 years having no recovery. This is consistent with the A.G. Shaper, A.N. Philips et al study.[7]

In the present study 94 patients (72.3%) were associated with multiple risk factors, they had a higher morbidity (complete recovery 7%) than the 36 patients (27.69%) who had a single risk factors (complete recovery 22.22%). This was consistent with the Bogousslavsky,[8] Feigin[2] and Bansal study.

Table 12: Prognosis during hospital stay

	Bogousslavsky[8] study (%)	Natan[9] study (%)	Present study (%)
Expired	5	13.8	12.30
Complete recovery	14	-	13
Partial recovery	40	-	37
No recovery	30	-	36

In the present study the mortality was more when compared with the Bogousslavsky[8] study but consistent with the Natan[9] study. Other prognostic parameters like compete recovery (13%), partial recovery (37%) and no recovery (36%) were consistent with Bogoussslavasky[8] study.

IV. Conclusion

Commonest modifiable risk factors in ischaemic stroke are hypertension, smoking, dyslipidemia, alcohol consumption, and diabetes mellitus.

Commonest non modifiable risk factors are increasing age, male sex and family history of stroke. Prognosis depends on the number of risk factors present. Multiple risk factors are associated with poorer prognosis.

Increasing age and hyperglycemia are also associated with poorer prognosis.

Treatment or prevention of modifiable risk factors can reduce the mortality and morbidity of stroke.

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