

Original Research Article


A study on risk profile in acute ischemic stroke patients at Urban Medical College, Tamil Nadu

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Abstract

Background: Risk factor modification remains as the principal aspect of care for stroke prevention. Understanding of risk factors has advanced and several options are now available to treat modifiable risk factors. Prevention of stroke begins with awareness of risk factors by patients and clinicians.

Aim: The aim of our study was to study the association of various risk factors for acute ischemic stroke.

Materials and methods: A total of 50 patients who presented with acute ischemic stroke were enrolled into the study after confirmation by CT scan. A detailed history regarding age, smoking, alcohol intake, diabetes, hypertension, dyslipidemia and ischemic heart disease were taken. Blood sugar, lipid profile and CRP estimation were done. 50 normal persons without any evidence of stroke were taken as control subjects. The prevalence of risk factors in patients with ischemic stroke was studied and compared with control subjects.

Results: Mean age of stroke patient was 60.62 years and control was 58.22 years. Smokers and alcoholic were 32% (case -21%, control 11%) and 36% (case -26%, control 10%) respectively. Diabetes, hypertension and IHD patients constituted 27% (case -20%, control 7%), 37% (case -30%, control 7%) and 20% (case -13%, control 7%) respectively. High CRP level was found in 47% (case -35%, control 12%) of patients. Dyslipidemia was found in 44% (case -38%, control 6%) of patients.

Conclusion: In our study smoking, alcohol, diabetes, hypertension, IHD, dyslipidemia and high CRP levels correlated well with ischemic stroke. Age and sex were not correlated with ischemic stroke.

Key words

Risk profile, Acute ischemic stroke, Urban Medical College, Tamil Nadu.

Introduction

Stroke is a multifactorial disease, both genetic and environmental risks affect the disease. Stroke risk factors have been classified as traditional and novel, and modifiable and non-modifiable. The non-modifiable risk factors include age, sex, ethnicity/race and family history. Stroke risk varies according to differences in these factors. Stroke risks can be controlled more easily than one might think. Treating health conditions and managing unhealthy lifestyle risk factors can make a difference. Improved detection and modification of risk factors could reduce the impact of this disease.

Materials and methods

Study method: This study was conducted in the department of general medicine at Kilpauk Medical College. A total of 50 patients who presented with acute ischemic stroke confirmed by CT scan were enrolled into the study. A detailed history regarding various risk factors like smoking, alcohol intake, hypertension, diabetes, ischemic heart disease was taken. Blood sugar and lipid profile and CRP estimation were done. Standard guidelines for the treatment of acute ischemic stroke were followed. None of the patients received any thrombolytic treatment. They were treated only with antiedema measures

and antiplatelets such as aspirin alone and with good nursing care and physiotherapy. Fifty normal persons without any evidence of stroke were taken as control subjects and risk factors correlated with stroke patients.

Inclusion criteria

Patients who presented within 48 hours of onset of stroke and who gave informed consent to participate in the study were included.

Exclusion criteria

Patients with rheumatic heart disease and collagen vascular disease, patients with the previous history of transient ischemic attack or reversible ischemic neurological deficit, subarachnoid hemorrhage, subdural hemorrhage and intracerebral hemorrhage, patients with evidence of active infection and neoplasm and patients with rheumatic heart disease and collagen vascular disease were excluded.

Statistical analysis

SPSS software was used for statistical analysis. Pearson chi-square test used for analysis. 'P' value <0.05 was considered as significant.

Results

Results were depicted as per **Table – 1 to 10**.

Table – 1: Case and control.

	Group	N	Mean	Std. Deviation	P >0.05 insignificant
Age	Case	50	60.6200	7.44474	
	Control	50	58.2200	6.51306	

Table – 2: Age and Stroke

Group			Case	Control	Total
Age group	<60 years	Count	24	32	56
		% within group	48.0%	64.0%	56.0%
	>60 years	Count	26	18	44
		% within group	52.0%	36.0%	44.0%
Total		Count	50	50	100
		% within group	100.0%	100.0%	100.0%

Pearson Chi-Square=2.597, p=0.107 insignificant

Group			Case	Control	Total
Sex	Male	Count	26	25	51
		% within group	52.0%	50.0%	51.0%
	Female	Count	24	25	49
		% within group	48.0%	50.0%	49.0%
Total		Count	50	50	100
		% within group	100.0%	100.0%	100.0%

Pearson Chi-Square=0.040, p=0.841 insignificant

Group			Case	Control	Total
Smoker	No	Count	29	39	68
		% within group	58.0%	78.0%	68.0%
	Yes	Count	21	11	32
		% within group	42.0%	22.0%	32.0%
Total		Count	50	50	100
		% within group	100.0%	100.0%	100.0%

Pearson Chi-Square=4.596*, p=0.032 significant

Group			Case	Control	Total
Alcohol	No	Count	24	40	64
		% within group	48.0%	80.0%	64.0%
	Yes	Count	26	10	36
		% within group	52.0%	20.0%	36.0%
Total		Count	50	50	100
		% within group	100.0%	100.0%	100.0%

Pearson Chi-Square=11.111**, p=0.001 significant

Group			Case	Control	Total
HT	No	Count	20	43	63
		% within group	40.0%	86.0%	63.0%
	Yes	Count	30	7	37
		% within group	60.0%	14.0%	37.0%
Total		Count	50	50	100
		% within group	100.0%	100.0%	100.0%

Pearson Chi-Square=22.694**, p<0.001 significant

Discussion

Stroke is a heterogeneous, multifactorial disease regulated by modifiable and non-modifiable risk factors. Modifiable traditional risk factors include hypertension, diabetes, hyperlipidemia, atrial fibrillation, smoking, obesity, and carotid

artery disease. Novel risk factors include hyperhomocysteinemia, hypercoagulable states, and select biomarkers.

Age and gender

Stroke incidence increases with age. With each decade after 55 years, the risk doubles. Approximately 80% of strokes occur in the elderly. Gender also affects the risks. Men develop strokes at a higher rate than women up to the age of 75 [1]. There is no correlation between age and gender with stroke in our study.

Group			Case	Control	Total
DM	No	Count	30	43	73
		% within group	60.0%	86.0%	73.0%
	Yes	Count	20	7	27
		% within group	40.0%	14.0%	27.0%
Total		Count	50	50	100
		% within group	100.0%	100.0%	100.0%

Pearson Chi-Square=8.574** p=0.003 significant

Group			Case	Control	Total
IHD	No	Count	33	47	80
		% within group	66.0%	94.0%	80.0%
	Yes	Count	17	3	20
		% within group	34.0%	6.0%	20.0%
Total		Count	50	50	100
		% within group	100.0%	100.0%	100.0%

Pearson Chi-Square=12.25**, p<0.001 significant

Group			Case	Control	Total
Dyslipidemia	No	Count	12	44	56
		% within group	24%	88%	78.6%
	Yes	Count	38	6	44
		% within group	76%	12%	21.4%
Total		Count	50	50	100
		% within group	100.0%	100.0%	100.0%

Pearson Chi-Square=41.558**, p<0.001 significant

Group			Case	Control	Total
CRP elevated	No	Count	15	38	53
		% within group	30%	76%	71.7%
	Yes	Count	35	12	47
		% within group	70%	24%	28.3%
Total		Count	50	50	100
		% within group	100.0%	100.0%	100.0%

Pearson Chi-Square=21.236**, p<0.001 significant

Hypertension

Hypertension is the single most important modifiable risk factor for all strokes accounting for up to 50% of all strokes. A meta-analysis of one million adults enrolled in 61 observational studies concluded that death from ischemic heart disease and stroke increases progressively and linearly with systolic blood pressure levels as low as 115 mm Hg and diastolic 75 mm Hg upward. This study also found that for every 20 mm Hg systolic or 10 mm Hg diastolic increase in blood pressure there is a doubling of mortality from both ischemic heart disease and stroke [2]. Hypertensive patient had a significant ischemic stroke in this study.

Smoking and Alcohol

Cigarette smoking is a well-established risk factor for ischemic stroke. Smoking is an independent stroke risk factor, increasing the risk of stroke by about 50% [3]. The risk increases proportionally with the number of cigarettes smoked per day and passive smoking also increases the risk of ischemic stroke. In Framingham et al study during 26 years of follow-up, 459 strokes occurred. The relative risk of stroke in heavy smokers (>40 cigarettes per day) was twice that of light smokers (fewer than ten cigarettes per day) [4].

Alcohol use has been linked to stroke in many studies. Drinking large amounts of alcohol may increase the risk for stroke. A random-effects model and meta-regression analysis were used to pool data from individual studies. Compared with abstainers, consumption of more than 60 g of alcohol per day was associated with an increased relative risk of total stroke, 1.64 (95% confidence interval [CI], 1.39-1.93); ischemic stroke, 1.69 (95% CI, 1.34-2.15); and hemorrhagic stroke, 2.18 (95% CI, 1.48-3.20), while consumption of less than 12 g/d was associated with a reduced relative risk of total stroke, 0.83 (95%, CI, 0.75-0.91) and ischemic stroke, 0.80 (95% CI, 0.67-0.96), and consumption of 12 to 24 g/d was associated with a reduced relative risk of ischemic stroke, 0.72 (95%, CI, 0.57-0.91). The meta-regression

analysis revealed a significant nonlinear relationship between alcohol consumption and total and ischemic stroke and a linear relationship between alcohol consumption and hemorrhagic stroke [5]. Smoking and alcohol were significantly correlated with ischemic stroke in our study.

Diabetes Mellitus

The relative risk of stroke in a person with diabetes ranges from 1.8 to 6.0 and diabetics tend to have strokes at a younger age [6]. The authors examined the relation of diabetic status (personal history of diabetes and/or fasting plasma glucose greater than 7.8 mmol per liter) to stroke risk in a population-based cohort of 3,778 adults aged 50 to 79 years in Rancho Bernardo, California who were followed from 1972 for an average of 12 years. There were 232 stroke cases, 139 of which were ascertained from death certificates [7]. Diabetic patients had ischemic stroke significantly in our study.

IHD

Stroke is a major complication associated with high mortality in patients with CHD, especially when hypertension is also associated [2]. Ischemic heart disease is very well correlated with stroke in our study.

Hypercholesterolemia

Both elevated total cholesterol, as well as low-density lipoprotein, increases the risk of CHD and stroke. One study found that high serum HDL levels were associated with reduced odds of having a large-vessel stroke (OR 0.8, 95% CI 0.6) [8]. Rossner, et al. in a study emphasized the importance of a low HDL concentration as an important independent risk factor for ischaemic stroke in the young adult [9]. Framingham et al found that a low-density lipoprotein (LDL) cholesterol concentration with a statistically significant excess of stroke in women and of deaths from non-coronary heart diseases in both sexes [10]. Dyslipidemia is very well correlated with ischemic stroke in our study.

Inflammation and biomarkers

Inflammation as part of the atherosclerotic pathway has been implicated in cardiovascular disease and ischemic stroke. Inflammatory biomarkers such as CRP, IL-6, and heat shock proteins have been shown to be elevated in acute ischemic stroke [11, 12]. Hs CRP is associated with ischemic stroke and poor prognosis in our study.

Conclusion

Risk factor assessment along with overall stroke risk estimation should be part of the evaluation of patients with stroke, and used with careful clinical judgment. The most effective means available for reducing the burden of stroke involve modification and treatment of vascular risk factors. Nevertheless, despite several available therapies for many of these risk factors, this task remains a challenge for clinicians and patients. However, patient awareness remains a limitation in the treatment of risk factors and most patients having a stroke have multiple risk factors.

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