

“A Study On the Severity of Ischemic Stroke (As Assessed By the Scandinavian Score) Among Diabetic and Non-Diabetic Patients”

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Abstract : Introduction: Cerebrovascular accident can be defined as an abrupt onset of focal neurological deficit. Type II diabetes mellitus and dyslipidaemia are major risk factors. **Background:** Previous studies have demonstrated that among diabetics with increased levels of lipoprotein (a), there is an increased risk of stroke. Higher levels predict early atherosclerosis, and this is independent of the other risk factors including LDL. **Objective:** To assess the severity of ischaemic stroke by the Scandinavian score, and to determine if there is a statistically significant difference in severity between diabetic and non-diabetic patients. **Methods:** Cross sectional, prospective study done at the Institute of Internal Medicine, Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai from August 2016 to June 2017. 100 patients with ischaemic stroke were included, with 50 patients who were type 2 diabetics, and 50 patients who were non-diabetics. **Results:** A total of 100 patients were included in our study. 50 patients had type 2 diabetes and 50 patients were non-diabetic. 62 patients were male and 38 patients were female. The mean age was 57 years, with a range from 42 to 73 years. The Scandinavian score was calculated for all patients, and was less than 15 for 23 diabetic patients and 15 non-diabetic patients. It was more than 15 for 27 diabetic patients and 35 non-diabetic patients. This was not found to be statistically significant (p value 0.099).

Keywords – Diabetes mellitus, Cerebrovascular accident, Stroke, Scandinavian score

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I. Introduction

Stroke is defined as rapidly developing clinical signs of focal or global disturbance of cerebral function with symptoms lasting for 24 hours or more, it is the most common neurological disorder worldwide. Stroke is known as cerebrovascular accident (CVA), derived from Greek word which means ‘Struck down with violence’¹.

According to the World Health Organisation, 15 million people suffer from stroke worldwide every year. Of these, 5 million die and another 5 million are permanently disabled².

Stroke kills more than 1,37,000 people a year, 1 of every 18 deaths. Every 40 seconds a stroke occurs every 4 minutes someone dies of stroke.

The incidence of stroke is higher in men than in women. Every year there are about approximately 700,000 cases of stroke, roughly 600,000 ischaemic lesions and 100,000 haemorrhages, with 175,000 fatalities from these causes³.

It is estimated that by the year 2020 stroke will become the 4th leading cause of disability adjusted life years⁴. The prevalence of stroke in India is estimated to be 203/100000 population above 20 years of age. The disability and morbidity is higher in elderly with doubling of death due to stroke in United States by the year 2030⁵.

Cerebrovascular accident is defined as the abrupt onset of focal neurological deficit. It was described if the patient was struck by the hand of God. Stroke may be due to ischaemia or haemorrhage, 85% of the stroke are ischaemic. Occurrence of stroke leads to a lot of physical disability and also cognitive and behavioural impairment. The most important risk factors that contribute to stroke are systemic hypertension, diabetes mellitus, dyslipidaemia, and cigarette smoking and heart diseases. These risk factors causing stroke when modified and kept under strict control have substantial influence in preventing its occurrence and reducing its severity.

Type 2 diabetes is a major risk factor; dyslipidaemia also plays a major role as risk factor for ischaemic stroke. Studies in the past demonstrated that patient with increased lipoprotein (a) and diabetes as risk factor for ischaemic stroke. High lipoprotein (a) predicts risk of early atherosclerosis independently of other risk factor including LDL⁶.

II. Objectives

1. To compare the severity of ischaemic stroke (as assessed by the Scandinavian score) between patients with diabetes mellitus type II and non-diabetic patients

III. Methodology

Study design:

Cross sectional, Human subjects, unicenter, cross-sectional prospective study.

Study Centre:

Institute of internal medicine
Madras medical college and Rajiv Gandhi government general hospital, Chennai

Study duration:

August 2016 to June 2017

Inclusion criteria:

1. Patients with stroke diagnosed clinically and proven radiologically
2. Age above 40 years

Exclusion criteria:

1. Patients with haemorrhagic stroke
2. Patients with cardio-embolic stroke
3. Patients with liver disease
4. Patients with smoking and alcoholism
5. Patients taking anti-epileptic drugs

Sample size:

Total of 100 patients – 50 with diabetes mellitus, and 50 without diabetes mellitus

Methodology:

Study was conducted in 100 patients of ischaemic stroke (CT proven). Subjects were divided into two groups – 50 patients with type II diabetes and 50 patients without diabetes. Patients are subjected to routine blood investigations, CBC, RFT, LFT, and fasting lipid profile, fasting blood sugar, HbA1C, CT brain. The Scandinavian Stroke Scale was used to prognosticate patients in both groups.

Observations:

In our study, among 100 patients, the mean age was 57.06, with a range from 42 to 73 years. As age increases the risk of stroke also increases. 62 patients were male and 38 patients were female. 51 patients were smokers and 49 patients were non-smokers. 34 patients were alcoholics and 66 patients were non-alcoholic

		Type II diabetic		Non-diabetic	
		Count	Table %	Count	Table %
Sex	Male	32	32.0%	30	30.0%
	Female	18	18.0%	20	20.0%
Smoker	Yes	25	25.0%	26	26.0%
	No	25	25.0%	24	24.0%
Alcoholic	Yes	20	20.0%	14	14.0%
	No	30	30.0%	36	36.0%

Scandinavian stroke scale :

Function	Score	
Consciousness	Fully conscious	6
	Somnolent, can be awakened to full consciousness	4
	Reacts to verbal command, but is not fully conscious	2
Eye movement	No gaze palsy	4
	Gaze palsy present	2
	Conjugate eye deviation	0
Arm, motor power	Raises arm with normal strength	6
	Raises arm with reduced strength	5
	Raises arm with flexion in elbow	4
	Can move, but not against gravity	2

	Paralysis	0
Hand, motor power	Normal strength	6
	Reduced strength in full range	4
	Some movement, fingertips do not reach palm	2
	Paralysis	0
Leg, motor power	Normal strength	6
	Raises straight leg with reduced strength	5
	Raises leg with flexion of knee	4
	Can move, but not against gravity	2
	Paralysis	0
Orientation	Correct for time, place and person	6
	Two of these	4
	One of these	2
	Completely disoriented	0
Speech	No aphasia	10
	Limited vocabulary or incoherent speech	6
	More than yes/no, but not longer sentences	3
	Only yes/no or less	0
Facial palsy	None/dubious	2
	Present	0
Gait	Walks 5 m without aids	12
	Walks with aids	9
	Walks with help of another person	6
	Sits without support	3
	Bedridden/wheelchair	0

The scores of patients with diabetes and without diabetes were compared. There was no statistical difference between the two groups (p value 0.099)

		Type II diabetes	Non-diabetics	Total
Scandinavian stroke scale	<15	23	15	38
	>15	27	35	62
Total		50	50	100

IV. Results

In our study, 100 patients were considered who had ischaemic stroke, with 50 patients who were diabetic and 50 patients who were non-diabetic. The study population was predominantly male (n=62) with an age range from 42 to 73 years, and a mean age of 57.06 years. There were approximately equal numbers of smokers and non-smokers in both groups, and 34 patients were alcoholics while 66 patients were not. 38 patients were found to have Scandinavian stroke scales of <15, with 23 diabetics and 15 non-diabetics. 62 patients were found to have Scandinavian stroke scales of >15, with 27 diabetics and 35 non-diabetics. Thus the association between diabetics and non-diabetics and the severity of ischaemic stroke was not found to be significant (p value 0.099)

V. Conclusion

1. When the Scandinavian stroke scale was used to determine severity of stroke, there was no significant difference in severity between diabetics and non-diabetics (p value 0.099)

LIMITATIONS

1. Sample size of the study was small with only 100 patients with ischaemic stroke
2. Controls were matched only for age and sex and not for other risk factors which would have been ideal
3. Seriously ill patients admitted in intensive care units were not included in this study due to difficulty in obtaining consent. This might have led to selection bias.

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