



ORIGINAL RESEARCH PAPER

General Medicine

ACUTE STROKE AND CORRELATION WITH THE PLASMA FIBRINOGEN LEVELS

KEY WORDS:

stroke, fibrinogen, Diabetes, Hypertension

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ABSTRACT

In urban India, stroke accounts for 1% mortality in all hospital admissions, 4% in all medical cases and about 20% in all disorders of central nervous system. The pathogenic factors in stroke like atherosclerosis and thrombosis are the same as for myocardial infarction in the latter disease, significant increase in plasma fibrinogen level has been detected, which has a correlation with severity of myocardial damage. It was therefore of interest to measure the plasma fibrinogen levels in patients with acute stroke and also to investigate whether these levels increase if the patient has additional risk factors like hypertension, diabetes, and smoking. The objective of the study is to measure plasma fibrinogen levels in patients with acute stroke and comparing with age, sex and risk factor matched controls.

INTRODUCTION

In urban India, stroke accounts for 1% mortality in all hospital admissions, 4% in all medical cases and about 20% in all disorders of central nervous system. Stroke is defined as an abrupt neurologic deficit that is attributable to focal vascular cause. Risk factors for stroke are hypertension, atrial fibrillation, hyperlipidemia, diabetes, myocardial infarction, smoking. Epidemiological observations indicate that high plasma fibrinogen levels strongly correlate with two major thrombotic complications of atherosclerosis, stroke and myocardial infarction. Fibrinogen is involved in events thought to play a major role in thrombosis stroke patient with higher plasma fibrinogen level have an increased risk for short term mortality and new cardiovascular events. The aim of this study is to estimate fibrinogen levels in patient with acute stroke. It is therefore of interest to measure the plasma fibrinogen levels in patient with acute stroke and also to investigate whether these levels increase if the patient has additional risk factors like hypertension, diabetes, smoking, obesity.

AIM & OBJECTIVES

- To detect plasma fibrinogen levels in patients with acute stroke.
- To compare and correlate the significance of plasma fibrinogen levels in patients with acute stroke with that of age, sex and risk factors matched controls.

INCLUSION CRITERIA

- Patients presenting with acute stroke within 24 hours of onset of symptoms.
- Patients of acute cerebrovascular accident in whom CT scan shows cerebral infarct or hemorrhage

EXCLUSION CRITERIA

- Patients with evidence of uremia.
- Patients with evidence of infection.
- Patients with evidence of active hepatic disease.
- Patients who have suffered from myocardial infarction in last three months.
- Patients who have undergone surgery in last three months

METHODS OF COLLECTING DATA

The study will be carried out on 50 consecutive patients admitted to Meenakshi medical college, Kanchipuram with acute stroke within 24 hours of the onset of symptoms. Detailed history will be taken to find out the risk factors such as hypertension, diabetes. Hypertension will be diagnosed by JNC VIII criteria. Diabetes will be diagnosed by American Diabetes Association criteria. Thorough general and systemic examination will be carried out. In addition to routine investigations as per standard protocol in the

evaluation of stroke patient, fasting plasma fibrinogen level is estimated and compared to age, sex and risk factors matched controls. Patient will be followed up till they are discharged from the hospital. Controls will be taken who are not suffering from stroke and are age, sex and risk factor matched.

DISCUSSION

In this study 50 patients were evaluated clinically and by using serum fibrinogen levels. In this study maximum number of patients were in the age group 60-69 years and the second common age group 35 to 59 years. 62% were male and 38% were female. In this study maximum plasma fibrinogen level among cases (patients) is 850mg/dl and in controls (normal individuals) 680mg/dl

Age group Yrs	Frequency cases	Frequency controls
30-39	3	3
40-49	11	11
50-59	11	11
60-69	15	15
70 and >70	10	10
Total	50	50

Patients	Cases	Controls
Males	31	31
Females	19	19
Total	50	50

Patients	Number	Mean ± SD mg%
Cases	50	602 ± 197.2463
Controls	50	301 ± 141.4538
		P = 2.16E-15

	Plasma fibrinogen levels in cases(mg/dl)	Plasma fibrinogen level in controls(mg/dl)
Minimum	180	130
Maximum	850	680

In this study patients (cases) with ischaemic and haemorrhagic stroke had higher mean fibrinogen levels compared to normal individuals (controls) which is statistically significant

In this study it was observed that both in cases and controls the fibrinogen levels increases a age advances

In cases males had mean fibrinogen of 595 and females had mean fibrinogen of 641

In controls males had mean fibrinogen of 357 and females had mean fibrinogen of 209

Age	Number	Cases	Controls
30-39	3	520	206
40-49	11	592	264
50-59	11	602	305
60-69	14	634	313
70 & above	11	664	320
Total	50	602	281
		P=1.3E-26	P=1.06E-16

Patients	Cases No.	Mean mg%	Control No	Mean mg%
Males	31	595	31	357
females	19	641	19	209
		P=0.193836		P=6.49E-06

	Ischemic Strokes	Hemorrhagic strokes
No of patients	44	06
Mean (cases)	629.7727	498.3333
Mean (controls)	300	308.3333
P value	8.02E-15	0.04095

There were 23(46%) smokers among cases and 23(46%) among controls. In cases, non smokers had higher fibrinogen levels than smokers which were not statistically significant. In controls, smokers had higher fibrinogen levels than non smokers, which were not statistically significant.

Patients	Cases	Controls
Smokers	23	23
Non-smokers	27	27
Total	50	50

In cases, among normotensive patients mean fibrinogen level was higher than hypertensive patients, mean values in hypertensive was 563 whereas it is 650 in patients who are normotensive. p values were not significant. In controls mean

fibrinogen levels were higher amongst hypertensives. Mean fibrinogen level in hypertensives was 305mg% whereas in normotensives mean plasma fibrinogen level was 297mg%.

Patients	No. of cases	Mean mg%	No. of controls	Mean mg%
Diabetic	15	543	15	282
Non diabetic	35	644	35	308
		P=0.116927		P=0.574357

In cases and controls non diabetics had higher fibrinogen levels which were not statistically significant.

In patients who were obese, mean fibrinogen level was 597 In non obese patients, mean fibrinogen level was 691. In cases non obese individuals had higher fibrinogen level than obese individuals. The difference was not statistically significant. In controls obese individuals had higher fibrinogen levels compared to non obese patients.

RESULTS

Out of the total 50 patients, 44 had ischemic stroke and 6 had hemorrhagic stroke. Mean plasma fibrinogen level amongst cases was 602 mg% where as in controls mean plasma fibrinogen level was 301mg%. This study shows that the plasma fibrinogen levels are significantly elevated in patients with strokes when compared to age, sex and risk factor matched controls.

CONCLUSION

In this study, mean plasma fibrinogen levels were significantly higher in stroke patients when compared to controls. Fibrinogen levels were significantly higher in males, and it showed increasing levels as the age advances.

Smoking, obesity, hypertension do not influence levels of plasma fibrinogen. Stroke incidence increases as the age advances and is more common in males than females. Plasma fibrinogen levels are elevated in ischemic strokes and hemorrhagic strokes.

Fibrinogen has an increasing trend as age advances and higher in males compared to females. Smoking, hypertension and obesity do not contribute to raise fibrinogen levels

Patients	No. of cases	Mean mg%	No. of controls	Mean mg%
Hypertensive	21	563	21	305
Normotensive	29	650	29	297
		P=0.039253		P=0.423479

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