



## Serum Uric Acid Level as a Predictive Marker in Acute Ischemic CVA

Authors

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### Abstract

**Background:** *Uric acid is a neuroprotective agent. However, its relationship with ischaemic stroke remains controversial. We analyzed the association between serum uric acid and ischemic stroke and clinical outcome.*

**Aim:** *1. To estimate the serum uric acid levels in patients with acute ischemic CVA.*

*2.To correlate the levels of serum uric acid with the clinical outcome in acute ischemic cva patients*

*3.To predict the risk of major adverse neurovascular effects following acute ischemic CVA using serum uric acid levels*

**Materials & Methods:** *Observational cross sectional study for a duration of 6 months*

**Observation & Conclusion:** *Serum uric acid level was found to be increased with patients with acute ischemic stroke and was associated with higher mortality.*

**Keywords:** *Uric acid, CVA, predictive factor.*

### Introduction

Stroke is the second most common cause of death worldwide after ischemic heart disease. Stroke is one of the main clinical manifestation of cerebrovascular disease and studies investigating the relation between the uric acid and stroke have been inconsistent. Many studies including the NHANES study concluded that uric acid is an independent risk factor for development of cardiovascular and cerebrovascular diseases.

### Serum Uric Acid

- It reflects circulating xanthine oxidase activity and oxidative stress production.
- Increased serum uric acid levels are linked to obesity, dyslipidemia and hypertension which is associated with increased risk of CVA.

### Materials & Methods

**Study design:** Cross-sectional study

**Study period:** June 2018 to November 2018

**Study centre:** Department of General Medicine, Kanyakumari Government Medical College, Asaripallam, Tamil Nadu, India

### Method

#### Inclusion Criteria

- Any adult (>18 years) patients who were diagnosed as a case of acute ischemic CVA on the basis of clinical history, examination and CT brain findings and admitted to emergency medical services/intensive care unit/medical wards of Kanyakumari government medical college

**Exclusion Criteria**

- Patients with previous history of TIA/CVA
- Patients on thiazide diuretics and cytotoxic drugs, pyrazinamide, ethambutol, nicotinic acid, levodopa, probenecid, allopurinol, losartan, atorvastatin,
- Patients with h/o gout, alcohol abuse, chronic renal insufficiency
- Patients whose CT scan shows hemorrhage, space occupying lesions,
- Patients who were known cases of cardiac diseases which could be the sources of emboli or whose echocardiogram shows evidence of emboli.
- Patients with malignancy
- Hypothyroidism
- Active infection, chronic inflammatory bowel disease.

About 100 patients of acute CVA who fulfill inclusion/exclusion criteria presented in 24 h onset of symptoms were studied. A detailed history and examination were carried out. All patients underwent routine investigations including hemoglobin, complete blood count, renal and liver function test, ECG and serum uric acid.

**Observation & Results**

Out of 100 acute stroke patients 64 (64%) were males, 36 (36%) were females. The mean age of study population was  $56.77 \pm 10.9$  years. Mean age of males among cases was  $54.69 \pm 12.89$  years and that of females was  $58.68 \pm 11.23$  yrs. Mean SUA level in was  $6.69 \pm 2.34$  mg/dl. Mean SUA level was significantly higher in cases of acute cva.

Mean SUA in hypertensive was  $7.86 \pm 2.31$  mg/dl and in normotensive was  $5.90 \pm 2.31$  mg/dl. Although mean SUA in hypertensive was more than normotensive but the difference was not found to be statistically significant (p value  $>0.05$ ).

Mean SUA in diabetics was  $6.78 \pm 2.35$  mg/dl and in nondiabetics was  $6.50 \pm 2.34$  mg/dl. Although mean SUA in diabetics was more than non-diabetics but the difference was not found to be statistically significant (p value  $>0.05$ ).

Mean SUA level was found to be higher in patients who had elevated serum total cholesterol ( $>200$ mg/dl), triglycerides ( $>150$ mg/dl), LDL ( $>130$ mg/dl) and low HDL ( $<40$ mg/dl) than those with normal lipid profile but the difference was not statistically significant. According to this study, 79 were found to be dyslipidemic (cholesterol  $>200$  mg/dl and TG  $>150$  mg/dl) and out of which 41 (51.89%) were found to be hyperuricemic. Mean serum uric acid level of dyslipidemics acute stroke patients was  $7.07 \pm 2.29$  mg/dl and that of patients with normal lipid was  $5.73 \pm 2.22$  mg/dl. Mean serum uric acid level was higher in dyslipidemics than normal lipid acute stroke patients and the difference was found to be statistically significant (0.0063) (However, prevalence of hyperuricemia was highest among patients with low HDL (58.33%)

Mean SUA in acute stroke patients who got expired ( $7.60 \pm 2.83$  mg/dl) was higher than those who survived ( $6.48 \pm 2.17$ mg/dl) and the difference was statistically significant (p=0.0476).

**Discussion**

In this study we determined the role of serum uric acid in acute stroke and its prognostic significance on stroke outcome. Mean SUA level was  $6.69 \pm 2.34$  mg/dl and half of them were hyperuricemic. In this study, majority of patients belong to age group between 55-68 years with male preponderance. In this study mean SUA level was found to be higher in patients who had elevated serum cholesterol ( $>200$ mg/dl), triglycerides ( $>150$ mg/dl) and LDL ( $>130$ mg/dl) than those with normal lipid profile but the difference was not significant. Mean serum uric acid level was higher in dyslipidemic than normal lipid acute stroke patients and the difference was found to be statistically significant ( $<0.05$ ). Mean SUA in acute stroke patients who had expired ( $7.60 \pm 2.83$  mg/dl) was higher than that those who survived ( $6.48 \pm 2.17$ mg/dl) and the difference was statistically significant (p=0.0476)

There is a great debate regarding role of uric acid in stroke. Increased uric acid levels have been

found to be associated with established risk factors of stroke such as hypertension, dyslipidemia, obesity and diabetes. 21 In the general elderly population, high uric acid levels were independently associated with increased incidence of fatal stroke. 22

### Conclusion

The study concludes that serum uric acid level was significantly elevated in patients of acute stroke, significantly associated with dyslipidemia, and had significant higher mortality association with hyperuricemic ischemic stroke patients and hence it can be considered as risk factor and poor mortality outcome.

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