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Original Research

Assessment of uric acid level in patients with stroke- A clinical study

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ABSTRACT

Background: Stroke is third common cause for mortality and fourth leading cause for disease burden. The present study was conducted to assess uric acid level in patients with stroke. **Materials & Methods:** The present study was conducted on 112 patients of stroke of both genders. Investigations like complete hemogram, renal profile, serum uric acid and lipid profile were performed wherever necessary. The NIH Stroke Scale (NIHSS) was used as a diagnostic method for assessing the severity of a stroke. **Results:** Out of 112 patients, males were 72 and females were 40. Hypertension was seen in 87 with mean uric acid of 6.24 mg/dl and was not present in 25 patients with mean uric acid level of 4.37 mg/dl. The difference was significant (P< 0.05). Minor stroke cases were seen in 78, moderate stroke in 29, moderate to severe stroke in 3 and severe stroke in 2 cases. The difference was significant (P<0.05). **Conclusion:** Authors found that there was increased uric acid level of strokes with hypertension.

Key words: Hypertension, Stroke, Uric acid

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Introduction

Stroke is third common cause for mortality and fourth leading cause for disease burden. Stroke is defined by (WHO) World Health Organization as 'a clinical syndrome consisting of rapidly developing clinical signs of focal (or global in case of coma) disturbance of cerebral function lasting more than 24 hour or leading to death with no apparent cause other than a vascular origin.' A transient ischaemic attack (TIA) is defined as stroke symptoms and signs that resolve within 24 hours.[1,2]

The risk factors for stroke are may be nonmodifiable (race, age, sex, low birth weight), modifiable (hypertension, dyslipidemia, diabetes, tobacco smoking, atrial fibrillation, cardiac disorder, sickle cell disease, diet and body mass index) and potential risk factors (metabolic syndrome, alcohol, drug abuse, sleep apnea, migraines, oral contraceptive use) and other environmental factors include lower education, poor economic status[2], tobacco, infections, body mass index (obesity, body mass index >30 kg/m^2) exercise and diet etc. Uric acid is an end product of purine metabolism in humans, is known to be relation with many systemic risk factors of stroke, such as hypertension, diabetes mellitus, insulin resistance and obesity.[4]

It has been reported that increased levels of uric acid are associated with established cardiovascular risk factor such as elevated serum triglyceride and cholesterol concentration, hypertension, obesity, insulin resistance and metabolic syndrome. On the other hand uric acid has been known to exert neuroprotective effects by acting as a free radical scavenger. In humans,

approximately one half the antioxidant capacity of plasma comes from uric acid.[5] The present study was conducted to assess uric acid level in patients with stroke.

Materials & Methods

The present study was conducted in the department of General Medicine. It comprised of 112 patients of stroke of both genders. Ethical clearance was taken from institutional ethical committee.

General information such as name, age, sex etc. was recorded. A thorough clinical examination was done in all patients. Investigations like complete hemogram, renal profile, serum uric acid and lipid profile were performed wherever necessary. The NIH Stroke Scale (NIHSS) was used as a diagnostic method for assessing the severity of a stroke. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 112		
Gender	**Males**	**Females**
Number	72	40

Table I, graph I shows that out of 112 patients, males were 72 and females were 40.

Graph I Distribution of patients

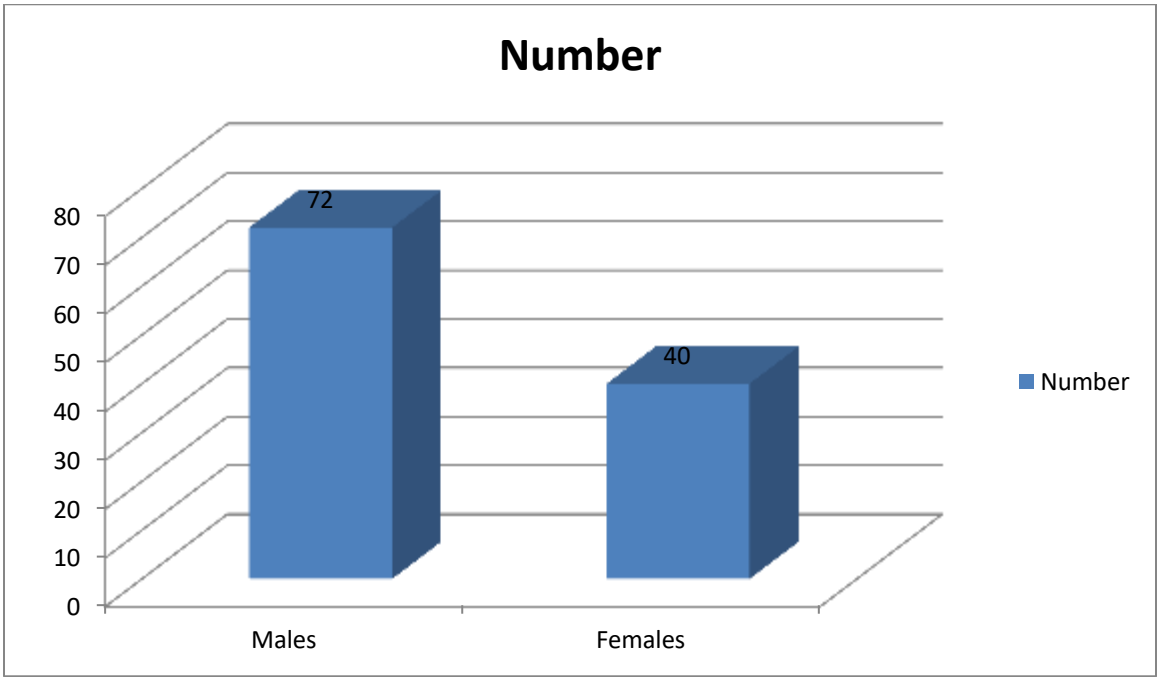


Table II Distribution of cases according to their hypertensive status

Hypertension	Number	Mean uric acid level	P value
Yes	87	6.24	0.025
No	25	4.37	

Table II, graph II shows that hypertension was seen in 87 with mean uric acid of 6.24 mg/dl and was not present in 25 patients with mean uric acid level of 4.37 mg/dl. The difference was significant (P< 0.05).

Graph II Distribution of cases according to their hypertensive status

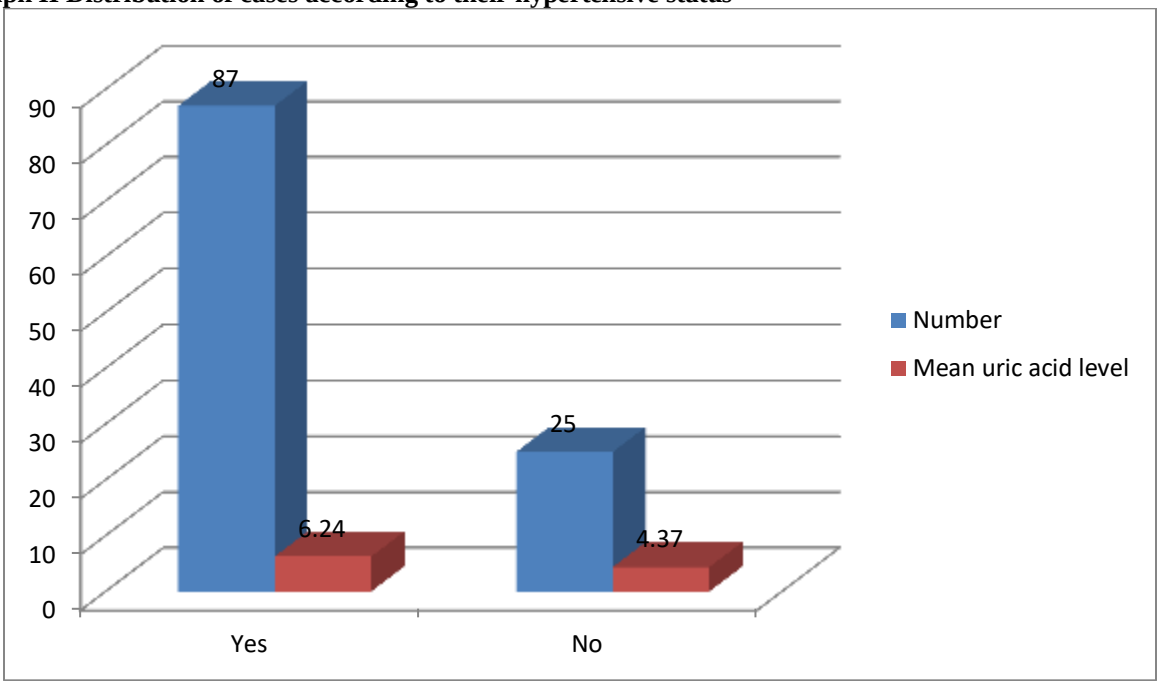
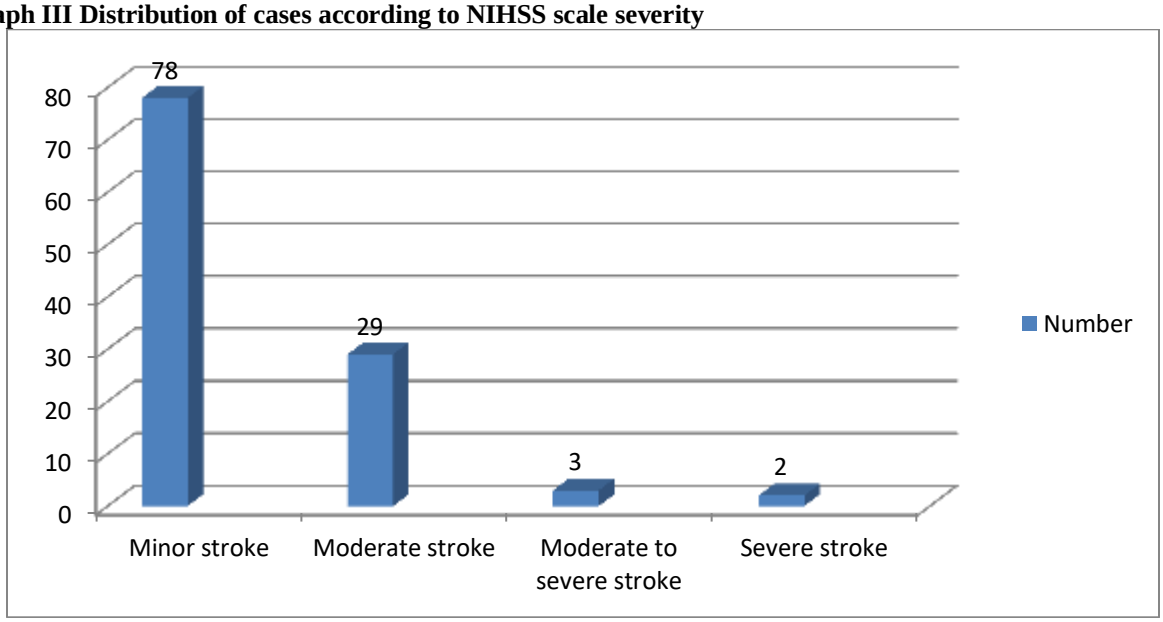


Table III Distribution of cases according to NIHSS scale severity

NIHSS scale severity	Number	P value
Minor stroke	78	0.01
Moderate stroke	29	
Moderate to severe stroke	3	
Severe stroke	2	

Table III, graph III shows that minor stroke cases were seen in 78, moderate stroke in 29, moderate to severe stroke in 3 and severe stroke in 2 cases. The difference was significant (P<0.05).

Graph III Distribution of cases according to NIHSS scale severity



Discussion

Stroke is a medical emergency condition, which needs immediate hospitalization to treat and save lives. A silent stroke does not have any outward symptoms and causes damage to the brain and places the patient at increased risk for both transient ischemic attack and major stroke in the future.[6] Stroke is the one of the main clinical manifestation of CVD and studies investigating the relation between the uric acid and stroke have been inconsistent. Some studies reported a positive independent relationship between uric acid and stroke whereas others demonstrated that uric acid did not relate significantly to stroke occurrence.[7] The present study was conducted to assess uric acid level in patients with stroke.

In present study, out of 112 patients, males were 72 and females were 40. Hypertension was seen in 87 with mean uric acid of 5.24 mg/dl and was not present in 25 patients with mean uric acid level of 4.37 mg/dl. Mozos et al[8] conducted a study to assess the awareness among the stroke survivors, questionnaire established on the risk factors for stroke from the previously published studies. Of 100 patients, 73% patients had ischemic stroke and 26% patients had hemorrhagic stroke. The mean age of the patients was 50 years and the incidence of stroke was predominant in males 73%, followed by females 27. It was observed that 70% of patients were hypertensives, 28% were diabetics, 27% were alcoholics, and 24% of patients had a habit of smoking, followed by others. The knowledge of the risk factors for stroke in stroke survivors was also very low, and the knowledge was varied among the subjects according to their level of educational status.

We found that minor stroke cases were seen in 78, moderate stroke in 29, moderate to severe stroke in 3 and severe stroke in 2 cases. Hariklia et al[9] conducted prospective cohort study among 2696 men and 3004 women to study uric acid as risk factor for stroke. Mean serum uric acid level in study was 357 ± 84 μmol/L for men and 276 ± 70 μmol/L for women. Which cited increase serum uric acid was significantly associated with increased risk of 31% for ischemic stroke in men and increased mortality risk in both genders, with 11% in men, and 16% in women, after multivariable adjustments. Gender-adjusted, multivariable analyses of pooled data from both men and women showed, for each 1 SD increase level of serum uric acid, causes 22% increased risk for ischemic stroke and increased risk for all-cause mortality up to 13%.

In a study by Amaro et al[10] fifty five patients with acute stroke were evaluated who 25 of these patients (45.5%) were female and 30 of them (54.5%) were male. The mean age of patients was 67±14 years. Mean serum uric acid levels in the patients studied 5.94±1.70 mg/dl, and about half of the patients (47.3%) were hyperuricemic. There was a significant negative correlation between age of patients and their serum uric acid level. Uric acid level was significantly higher in men than women. Hyperuricemia was associated with increased amounts of triglycerides and Low-density lipoprotein (LDL) cholesterol. In patients with acute stroke, there was no significant association between serum uric acid level and diabetes mellitus, hypertension, history of ischemic heart disease, smoking, prescription rTPA, and type of stroke.

Conclusion

Authors found that there was increased uric acid level of strokes with hypertension.

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