Original Research Article

To Evaluate Association of Serum Uric Acid (Biochemical Marker) in Acute Ischemic Stroke

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Abstract

Background: Serum uric acid (SUA)is a biochemical marker in number of diseases, this study is to evaluate association of serum uric acide in acute ischemic stroke. Among all the neurological diseases of adult life, the cerebrovascular ones clearly rank the first in frequency and importance. At least 50% of the neurological disorders in a general hospital are of this type. Stroke, after heart disease and cancer is the most common cause of death. Aim of this study to association between Serum uric Acid (SUA) and acute ischemic stroke.

Method: A total of 60 patients of either sex were enrolled for the above study. The study was cross sectional. Study was carried in Department of General Medicine, RVM Medical College, Gajwel Siddipet, Telangana from April 2025 to September 2025. A total of 60 patients (30 males and 30 females) with acute stroke who met the criteria, admitted in Department of General Medicine, in our institution were included in this study.

Result: Majority of this stroke population are between 50 to 69 years old, (61 %) of the population) with 20 Males and 17 females. The elderly population, above 70 years old constitutes 20 % of the population with 5 males and 5females. Hypertension constitutes the major risk factor in this stroke population as 65 % of the population is hypertensive. 20 males and 19 females are hypertensives and form 68 % and 62 % in their respective population. Diabetes mellitus ranks second as a risk factor, constitute 51% of the study population with 14 (46 %) males and 16 (56 %) females. Coronary Artery Disease is associated in 32 % of the population with 9 (30 %) males and 10 (34 %) females. 34 % of the stroke population has adverse lipid profile and both sexes share equal number of hyperlipidemics (10 each). Among the male population, 20 (68 %) are smokers and 10 (32 %) are alcoholics. As per this study; Serum Uric Acid were; Less than 5 mg / dl – 49 % (15 males and 14 females) Between 5 – 6.9 mg / dl - 26 % (8 males and 8 females) Above and equal to 7 mg / dl - 25 % (7 males and 8 females).

Conclusion: This study shows that elevated SUA is strongly associated with an increased risk for the development of acute ischemic stroke in this study population.

Keywords: Serum Uric Acid (SUA), acute ischemic stroke.

Introduction

Among all the neurological diseases of adult life, the cerebrovascular ones clearly rank the first in frequency and importance. At least 50% of the neurological disorders in a general hospital are of this type. Stroke, after heart disease and cancer is the most common cause of death. In the developed countries among 700000 cases of stroke, roughly 600000 are ischemic lesions. All the physicians have a role to play in the prevention of stroke by encouraging the reduction in risk factors.[1] Stroke also entails a high socio-economic burden due to increased morbidity and mortality.[2] Ischemic strokes account for >80% of total stroke events. Early identification of individuals at risk could be of help in primary prevention strategies.[3] UA is the most abundant aqueous antioxidant in humans and contributes as much as two-thirds of all free radical scavenging capacity in plasma. It is particularly effective in quenching hydroxyl, superoxide and peroxynitrite radicals, and may serve a protective physiological role by preventing lipid peroxidation.[4] Evidence from epidemiological studies suggests that the elevated SUA levels may predict an increased risk for

cerebrovascular (CV) events including stroke[5-7]. Moreover therapeutic modalities with a SUA lowering potential have been shown to reduce CV disease morbidity and mortality[8]. In this respect SUA levels could be used as an easy to measure serum marker in selecting and appropriately treating subjects at risk[9]. SUA has been recently associated with insulin resistance. Although high SUA levels have been identified as an important risk factor for stroke in unselected populations in a number of epidemiological studies, it is unclear whether high SUA levels promote or protect against the development of CV disease or simply acts as a passive or circumstantial marker of increased risk[10].

Material and Methods

A total of 60 patients of either sex were enrolled for the above study. The study was cross sectional. Study was carried in Department of General Medicine, RVM Medical College, Gajwel Siddipet, Telangana from April 2025 to September 2025

based on following criteria. All adult patients with acute ischaemic stroke with or without CT Scan of infarction within 24 hrs. of onset of Stroke attending Department of General Medicine and Emergency Medicine, in our institution were included into study while; Previous history of TIA / CVA, CT scan showing haemorrhage or other space occupying lesions other than infarct, On thiazide diuretics, Uncontrolled systemic, hypertension, Known cases of gout or show clinical evidences of gout, Chronic renal failure patients, Haemotological abnormalities like leukemia or other myeloproliferative disorders were excluded from study.

Results

A total of 60 patients (30 males and 30 females) with acute stroke who met the criteria, admitted in Department of General Medicine, RVM Medical College, Gajwel Siddipet, Telangana were included in this study.

Table 1: Distribution of the patients as per the age

Age in years	Cases	
	Number	Percentage
Less than 40	-	-
41-49	11	19
50-59	16	26
60-69	21	35
70-79	10	16
80 and above	2	4
Total	60	100

Majority of this stroke population are between 50 to 69 years old, (61 %) of the population) with 20 Males and 17 females. The elderly population, above 70 years old constitutes 20 % of the population with 5 males and 5 females.

Table 2: Distribution of the patients as per Risk Factors

Risk Factor	Number	Percentage
Hypertension		
• Present	39	65
• Absent	21	35
Diabetes Mellitus		
• Present	30	50
• Absent	30	50
Smoking (among Males)		
• Present	20	68
• Absent	10	32
CAD		
• Present	19	32
• Absent	41	68
Hyper lipid		
• Present	20	34
• Absent	40	66
Alcoholism (among Males)		
• Alcoholic	19	32
• Non alcoholic	7	62
	4	6

• Occasional Drinker		

Hypertension constitutes the major risk factor in this stroke population as 65 % of the population is hypertensive. 20 males and 19 females are hypertensives and form 68 % and 62 % in their respective population. Diabetes mellitus ranks second as a risk factor, constitute 51% of the study population with 14 (46 %) males and 16 (56 %) females. Coronary Artery Disease is associated in 32 % of the population with 9 (30 %) males and 10 (34 %) females. 34 % of the stroke population has adverse lipid profile and both sexes share equal number of hyperlipidemics (10 each). Among the male population, 20 (68 %) are smokers and 10 (32 %) are alcoholics.

Table 3: Distribution of the patients as per the Uric acid levels and their association with risk factors

	Number	Percentage
Less than 5 mg/dl	29	49%
Between 5-6.9 mg/dl	16	26%
Above and equal to 7 mg/dl	15	25%

The distribution of uric acid levels in the study population are as under:

Less than 5 mg / dl – 49 % (15 males and 14 females) Between 5 – 6.9 mg / dl - 26 % (8 males and 8 females) Above and equal to 7 mg / dl - 25 % (7 males and 8 females).

Discussion

Stroke is defined as rapid onset of focal neurological deficit, resulting from diseases of cerebral vasculature and its content. In India, community surveys have shown a crude prevalence rate for hemiplegia is in the range of 200 per 100, 000 persons, nearly 1.5% of all urban hospital admissions, 4.5% of all medical and around 20% of Neurologic case (66). The mortality rate of stroke in the acute phase is as high as 20% and it remains higher for several years after the acute event in stroke population than the general population (67). Stroke is the second cause of disability and dementia in adults > 65 years worldwide; close to 25% stroke survivors develop dementia. Stroke is also an important cause of morbidity and long-term disability; upto 40% survivors are not expected to recover their independence with self-care and 25% unable to walk independently. In our study we have found that Majority of this stroke population are between 50 to 69 years old, (61%) of the population) with 20 Males and 17 females. The elderly population, above 70 years old constitutes 20% of the population with 5 males and 5 females. Hypertension constitutes the major risk factor in this stroke population as 65% of the population is hypertensive. 20 males and 19 females are hypertensives and form 68% and 62% in their respective population. Diabetes mellitus ranks second as a risk factor, constitute 51% of the study population with 14 (46%) males and 16 (56%) females. Coronary Artery Disease is associated in 32% of the population with 9 (30%) males and 10 (34%) females. 34% of the stroke population has adverse lipid profile and both sexes share equal number of hyperlipidemics (10 each). Among the male population, 20 (68%) are smokers and 10 (32%) are alcoholics. As per this study; Serum Uric Acid were; Less than 5 mg / dl – 49% (15 males and 14 females) Between 5 – 6.9 mg / dl - 26% (8 males and 8 females) Above and equal to 7 mg / dl - 25% (7 males and 8 females). Millinois et al [11] and Warning et al [12] found high levels of SUA in males, which is not seen in our study. However, in elderly population both sexes show high levels of SUA which has statistical significance. Our study is consistent with Milinois *et al* who found elevated SUA in individuals older than 70 years.

Conclusion

This study shows that elevated SUA is strongly associated with an increased risk for the development of acute ischemic stroke in this study population. When treating aged people and diabetics, the link between high SUA and ischemic stroke may need to be taken into account. One of the risk factors for acute ischemic stroke and its related metabolic illnesses, such as hypertension and diabetes, is elevated SUA. If you are treating a high-risk group, lowering the SUA level might be thought of as one of your preventative stroke treatment options. To determine whether lowering SUA levels with dietary changes, lifestyle changes, and medication can ultimately minimise the risk of ischemic stroke, more research is needed.

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