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Estimation of Serum Uric Acid and Correlation with Clinical Findings in Stroke Patients Using National Institute of Health Stroke Scale

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ABSTRACT

Stroke remains a leading cause of global morbidity and mortality, with ischemic strokes accounting for nearly 87% of all cases. Emerging evidence highlights serum uric acid (SUA) as a potential biomarker for stroke prognosis, although its role remains paradoxical—demonstrating both neuroprotective and neurotoxic effects. This cross-sectional study conducted in a tertiary care centre at Puducherry aimed to investigate the correlation between SUA levels and stroke severity, as measured by the NIH Stroke Scale (NIHSS), in 118 patients aged above 40 years.

Demographic and clinical variables—including age, gender, hypertension, diabetes, smoking habits, and drug history—were systematically recorded. SUA levels were stratified and analyzed against NIHSS scores to evaluate stroke severity and short-term outcomes. Results indicated a statistically significant association: patients with elevated SUA levels exhibited markedly higher NIHSS scores, reflecting greater stroke severity. Notably, SUA levels increased significantly with age, and a majority of patients with very severe stroke had SUA levels exceeding 6.0 mg/dL.

These findings support the hypothesis that elevated SUA is correlated with poorer clinical outcomes in acute ischemic stroke. Given the ease of SUA measurement, its integration into stroke assessment protocols could enhance prognostic accuracy. However, further multicentric studies with larger sample sizes and neuroimaging data are needed to establish its utility as a standalone biomarker.

INTRODUCTION

Stroke is a major global health concern, ranking as the second leading cause of death and a primary contributor to long-term disability worldwide. Stroke is defined as a clinical syndrome characterized by rapidly developing signs of focal or global disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than vascular origin. Ischemic stroke, caused by obstruction of cerebral blood flow, accounts for approximately 87% of all stroke cases.[1]

Among the many biomarkers explored for their prognostic value in stroke, serum uric acid (SUA) has garnered significant attention. Uric acid is the final oxidation product of purine metabolism in humans and possesses both antioxidant and prooxidant properties depending on its concentration and the surrounding biochemical milieu.[2,3] While SUA is known to scavenge free radicals such as hydroxyl and peroxynitrite, elevated levels have also been implicated in endothelial dysfunction, inflammation, and increased cardiovascular risk.

The paradoxical role of SUA in stroke pathophysiology has led to conflicting interpretations. Some studies suggest that higher SUA levels may confer neuroprotection by mitigating oxidative stress during acute ischemic events. Conversely, other research indicates that hyperuricemia is associated with increased stroke severity and poorer outcomes, possibly due to its proinflammatory effects and association with comorbidities like hypertension, diabetes, and metabolic syndrome.

A meta-analysis by Qiao et al. (2021) involving over 68,000 participants found a significant dose-response relationship between elevated SUA and increased risk of both ischemic and hemorrhagic stroke, with a stronger correlation observed in females.[4] Similarly, a South Indian cohort study demonstrated that patients with elevated SUA levels had higher NIH Stroke Scale (NIHSS) scores, indicating more severe neurological impairment.[5]

Given the ease of measuring SUA and its potential to reflect underlying oxidative and inflammatory processes, this study aims to investigate the clinical correlation between serum uric acid levels and stroke severity in patients presenting with acute

ischemic stroke. By stratifying patients based on SUA levels and evaluating their neurological status using NIHSS, this research seeks to clarify the prognostic utility of SUA and explore its integration into routine stroke assessment protocols.

MATERIAL AND METHOD

Study design and setting:

This was a cross-sectional study conducted in a Tertiary Care Centre at Puducherry for a period of 18 months following ethical clearance from the Institutional Ethics Committee (No:23/SVMCH/IEC-Cert/Oct22).

Study population:

A total of 118 patients were enrolled using simple random sampling, based on a prevalence estimate of ischemic stroke at 0.2 from prior literature. Subjects were recruited within 48 hours of stroke onset, confirmed by neuroimaging (CT/MRI), and categorized into two groups based on serum uric acid levels:

- **Normal SUA Group**:
  - Males: ≤6.2 mg/dL
  - Females: ≤5.7 mg/dL
- **Elevated SUA Group**:
  - Males: >6.2 mg/dL
  - Females: >5.7 mg/dL

Exclusion Criteria

Patients were excluded if they had:

- Hemorrhagic stroke or TIA
- History of gout, tumor lysis syndrome, malignancy, or chronic kidney disease
- Use of uric acid-modifying drugs (e.g., diuretics, salicylates, pyrazinamide, ethambutol, levodopa)
- Sepsis, autoimmune disorders, or prior cerebrovascular events
- Pregnancy or lactation

Data Collection and Clinical Assessment

- **Demographics and Risk Factors**: Age, gender, smoking, alcohol use, hypertension, diabetes, dyslipidemia
- **Neurological Evaluation**: Stroke severity assessed using the NIH Stroke Scale (NIHSS) at admission and again at 14 days
- **Functional Outcome**: Evaluated using the Modified Rankin Scale (mRS) at day 14
- **Laboratory Investigations**:
  - Serum uric acid measured using urate oxidase reagent on a DAX analyzer
  - Lipid profile, HbA1c, renal function tests, and fasting glucose

Neuroimaging via CT/MRI performed on admission

STATISTICAL ANALYSIS

The data collected were subjected to Statistical Analysis using SPSS version 16. Frequency analysis, Cross Tabulation, Independent Sample _t' tests and Paired sample _t' test were performed for appropriate variables. The probability value, p was defined as 0.05 for all the significance tests. A _p' value less than 0.05 is considered significant and a value less than 0.01 is considered as highly significant. The results of the Statistical analysis are presented in subsequent tables

Table 1: Distribution of Patients based on Age and Gender

Age in Years	Frequency	Percent	Cumulative Percent
<=40	12	10.2	10.2
41-50	27	22.9	33.1
51-60	36	30.5	63.6
61-70	29	24.6	88.1
>70	14	11.9	100.0
Total	118	100.0	
Distribution of Patients based on Gender			
Gender	**Frequency**	**Percent**	**Cumulative Percent**
Male	75	63.6	63.6
Female	43	36.4	100.0
Total	118	100.0	

RESULTS

Distribution of Patients based on Age and Gender

Table 1 presents the distribution of patients based on age and gender, 30.5% of the patients belong to the age group of 51 to 60 years, 24.6% of the age group 61 to 70 years, 22.9% of the age group 41 to 50 years, 11.9% of the patients are above 70 years and 10.2% are below 40 years of age. Based on gender 63.6% of the patients in the study group are male and 36.4% are female.

Distribution of hypertension, smoking habit, diabetes prevalence, use of medication, use OAD/Insulin, use of chronic drug and level of uric acid:

Distribution of patients based on prevalence of hypertension, based on their smoking habit, prevalence of diabetes, based on their use of medication, based on their use of OAD/Insulin, based on their use of Chronic Drug, and based on their level of uric acid were depicted in table 2.

Table 2: Distribution of hypertension, smoking habit, diabetes prevalence, use of medication, use OAD/Insulin, use of chronic drug and level of uric acid

		Frequency	Percent	Cumulative Percent
Prevalence of Hypertension	Yes	62	52.5	52.5
	No	56	47.5	100.0
Smoking Habit	Yes	51	43.2	43.2
	No	67	56.8	100.0
Prevalence of Diabetes	Yes	38	32.2	32.2
	No	80	67.8	100.0
Use of Medication	Yes	81	68.6	68.6
	No	37	31.4	100.0
Use of OAD/Insulin	Yes	12	10.2	10.2
	No	106	89.8	100.0
Use of Chronic Drug	Yes	86	72.9	72.9
	No	32	27.1	100.0
Level of uric acid	Normal	69	58.5	58.5
	Elevated	49	41.5	100.0
	Total	118	100.0	

Table 2 depicts that 52.5% of the patients in the study group have Hypertension and 47.5% do not have hypertension. In the study group 56.8% of the patients do not smoke and 43.2% have the habit of smoking. It is clear from the table that 67.8% of the Patients do not have diabetes and 32.2% of the patients have Diabetes and 68.6% of the patients are using medication and 31.4% of them do not use any medication. It is clear from the table that 89.8% of the patients are not using OAD/Insulin whereas 10.2% are using OAD/Insulin. It is evident from the table that 72.9% of the patients are using Chronic Drug whereas 27.1% are not using Chronic Drug. Normal uric acid level was noted in 58.5% of the patients and 41.5% of the patients have elevated levels of uric acid.

Table 3: Significance test for association between Uric Acid and gender Uric acid levels based on gender and age:

		N	Uric Acid (mg/dL)		
			Mean	Std. Deviation	
Gender	**Male**	75	5.488	1.2850	**„t" test value** -0.689 df=118 p>0.05
	Female	43	5.649	1.0964	
	<=40	12	5.225	1.2571	ANOVA „F" Value 10.553 p<0.05
	41-50	27	4.841	0.8902	
	51-60	36	5.231	1.0847	
	61-70	29	6.214	0.8696	

Age in years	>70	14	6.614	1.4114	
	Total	118	5.547	1.2174	

Distribution of patients on level of uric acid based on gender and age; 66.7% of the Male and 44.2% of the female have normal uric acid level. 33.3% of the male and 55.8% of the female have elevated levels of Uric Acid.

Table 3 presents the significance test for association between Uric Acid and gender. There is no significant difference in the Uric acid level based on gender as the ‗t' statistic (-0.689) is insignificant ($p>0.05$). The Mean Uric acid in male patients is 5.488 ± 1.2840 mg/dL and female patients is 5.649 ± 1.0964 mg/dL.

Presents the distribution of patients based on level of uric acid and age. It is evident from the table that 83.3% of the patients below 40 years of age have normal Uric acid level and 16.7% have elevated Uric acid. Among the patients between 41 and 50 years of age 92.6% have normal levels of uric acid and 7.4% have elevated levels of uric acid. 77.8% of the patients of 51 to 60 years of age have normal levels of uric acids and 22.2% have elevated levels of uric acid. In contrast, 82.8% of the patients between 61 and 70 years of age have elevated levels of uric acid and 17.2% have normal levels of Uric acids. Among the patients above 70 years of age 92.9% have elevated levels of uric acid and 7.1% have normal levels of uric acid.

The uric acid level in the patients based on their age shows a significant difference in the level of Uric acid in the patients based on their age as depicted by significant ‗F' value of 10.553 ($p<0.05$). The average uric acid in the patients who are below 40 years is 5.225 ± 1.2571 mg/dL, 4.841 ± 0.8902 mg/dL in the patients who are between 41 and 50 years of age, 5.231 ± 1.0847 mg/dL in the patients who are between 51 and 60 years of age, 6.214 ± 0.8696 mg/dL in the patients who are between 61 and 70 years of age and 6.614 ± 1.4114 mg/dL in the patients who are above 70 years of age.

Based on the NIHSS scale, distribution of patients based on level of consciousness, LOC Questions Scale, LOC Commands Scale, Best Gaze Scale Table, Visual fields scale, Facial Paresis scale, Motor Arm left scale, Motor Arm Right scale, Motor Leg Left scale, Motor Leg Right scale, Limb Ataxia Scale, sensory scale, best language scale, Dysarthria scale, and Extinction and Inattention given in figure 1a, b, & c.

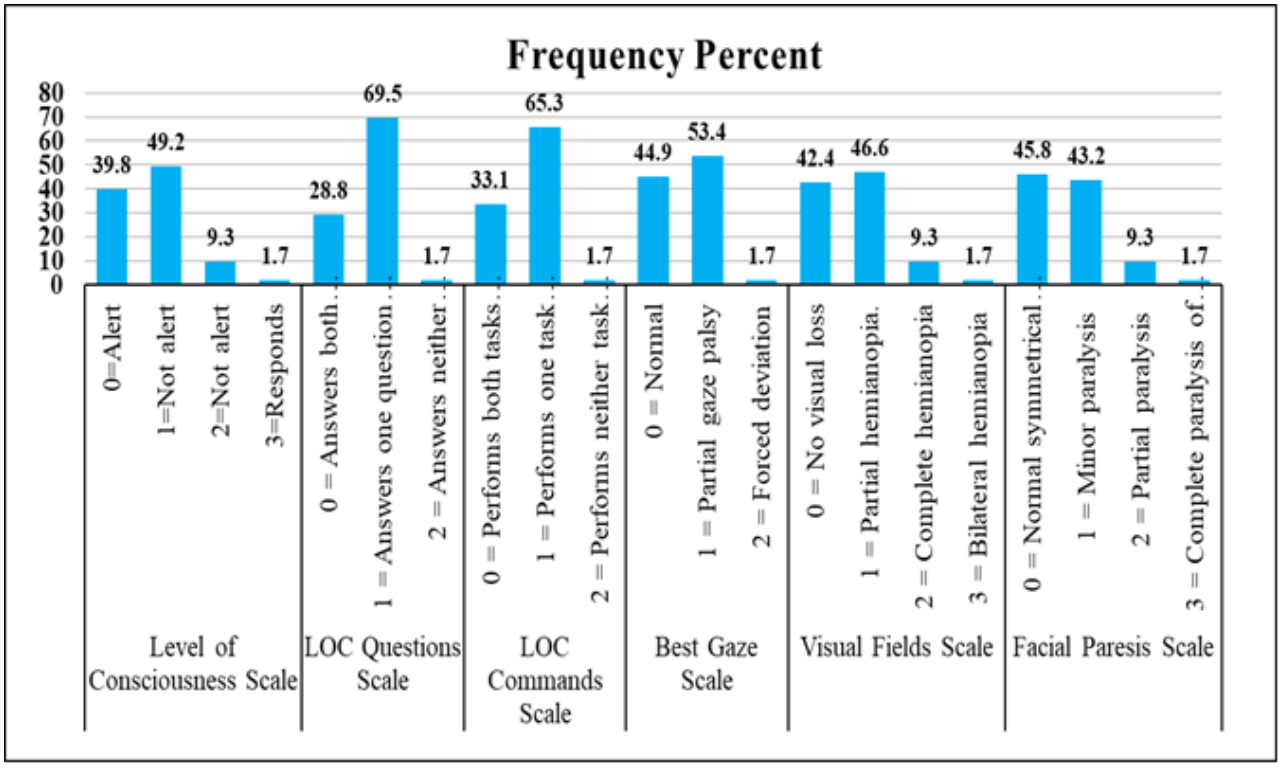

Figure 1a: Frequency and Percentage based on NIHSS scale

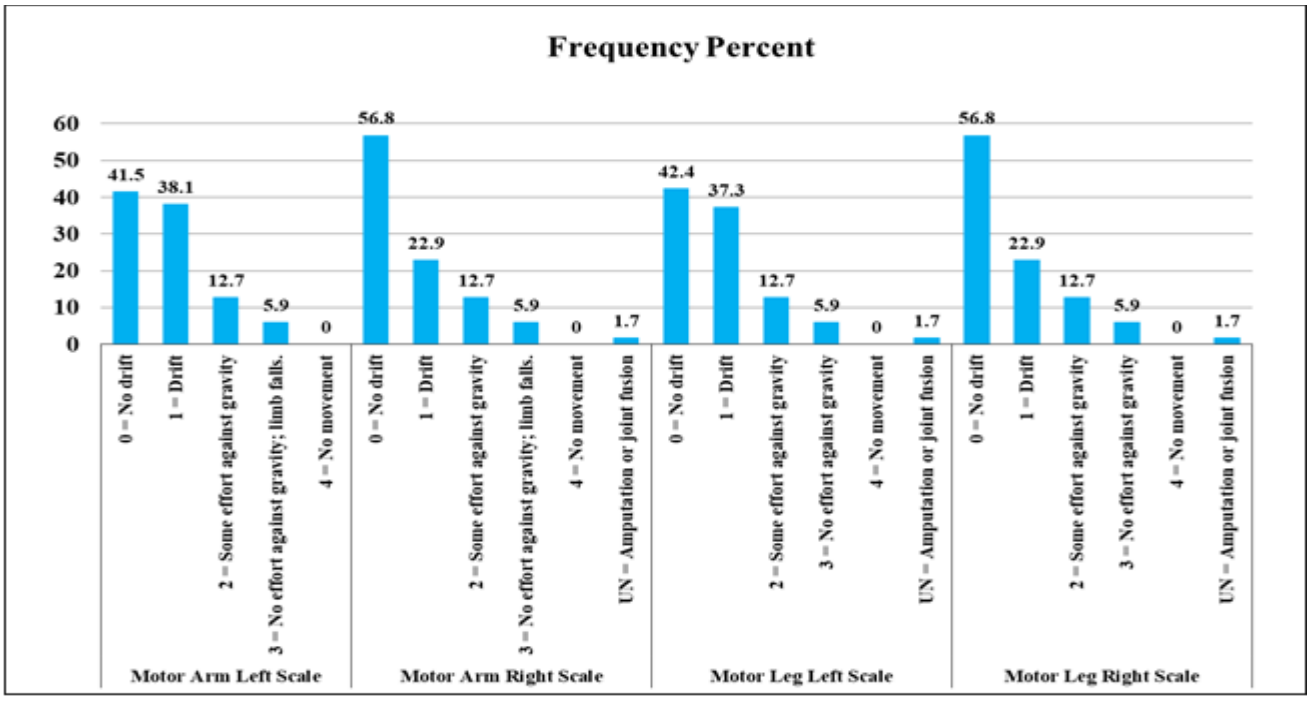

Figure 1b: Frequency and Percentage based on NIHSS scale

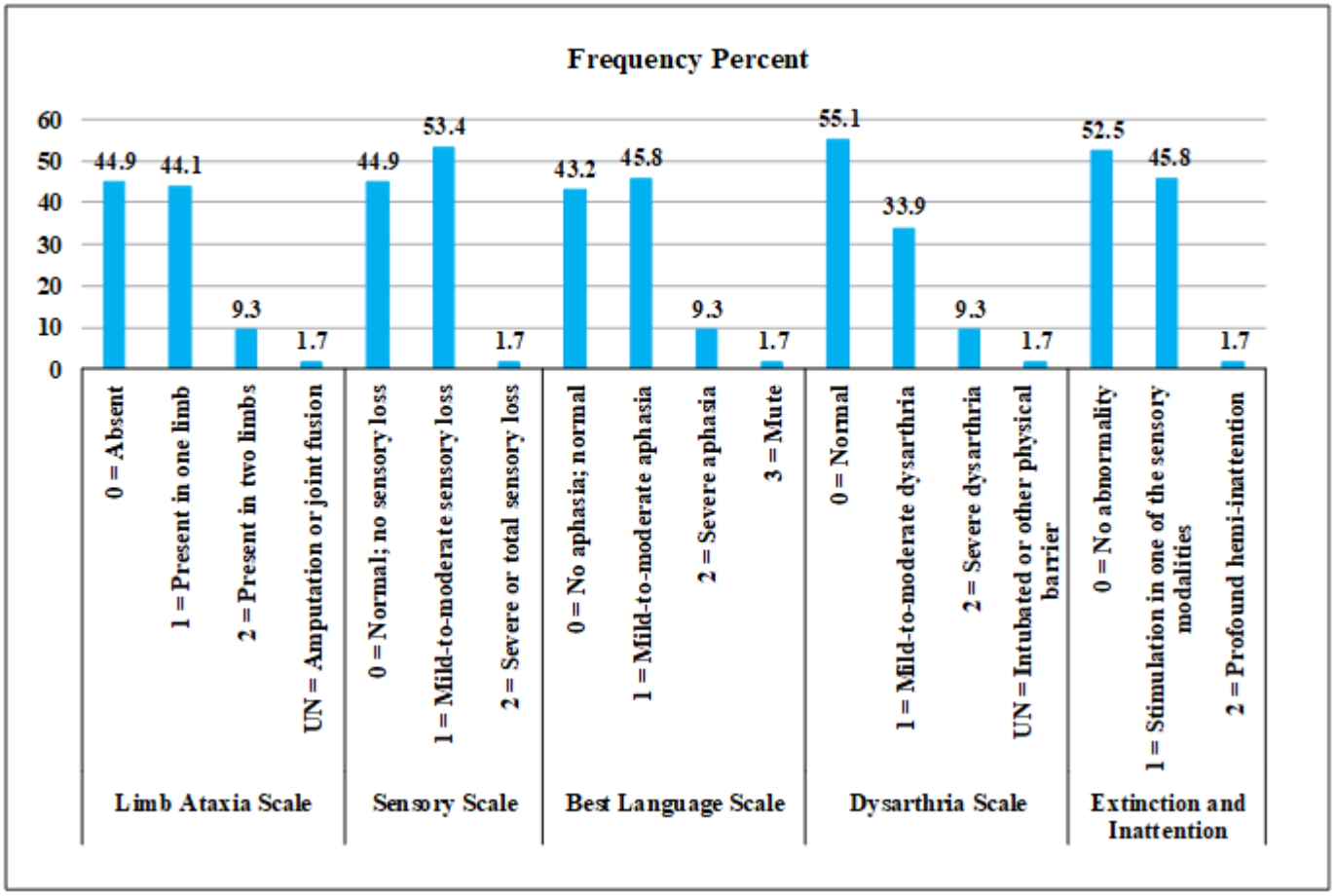

Figure 1c: Frequency and Percentage based on NIHSS scale

Distribution of Patients based on the Scale of their level of Consciousness is evident from the table that 39.8% of the patients are Alert with a Consciousness level scale of 0, 49.2% of the patients are not alert but arousable by minor stimulation to obey, answer, or respond with a Consciousness scale of 1, 9.3% are not alert but requires repeated stimulation to attend, or is obtunded and requires strong or painful stimulation to make movements (not stereotyped) with a Consciousness scale of 2 and 1.7% have a Consciousness Scale of 3 who respond only with reflex motor or autonomic effects, or totally unresponsive, flaccid, and areflexic.

Distribution of Patients based on LOC Questions scale shows that 28.8% of the Patients have scored 0 who answered both questions correctly, 69.5% of the patients have scored 1 who answered one question correctly and 1.7% of the Patients have scored 2 who answered neither question correctly.

Distribution of Patients based on LOC Commands scale shows that 33.1% of the Patients have scored 0 who performed both tasks correctly, 65.3% of the patients have scored 1 who performed one task correctly and 1.7% of the Patients have scored 2 who performed neither task correctly.

Distribution of Patients based on best gaze scale shows that 44.9% of the patients have scored 0 who had normal gaze, 53.4% of the patients have scored 1 who had partial gaze palsy and 1.7% of the Patients have scored 2 who Forced deviation, or total gaze paresis is not overcome by the oculocephalic maneuver.

Distribution of Patients based on Visual fields scale shows that 42.4% of the Patients have scored 0 who had no visual loss, 46.6% of the patients have scored 1 who had partial hemianopia, 9.3% of the patients have scored 2 who had complete hemianopia and 1.7% of the Patients have scored 3 who had Bilateral hemianopia.

Distribution of Patients based on Facial Paresis scale shows that 45.8% of the Patients have scored 0 who had Normal symmetrical movements, 43.2% of the patients have scored 1 who had Minor paralysis (flattened nasolabial fold, asymmetry on smiling), 9.3% of the patients have scored 2 who had Partial paralysis (total or near-total paralysis of lower face) and 1.7% of the Patients have scored 3 who had Complete paralysis of one or both sides (absence of facial movement in the upper and lower face).

Distribution of Patients based on Motor Arm left scale shows that 41.5% of the patients have scored 0 who had No drift; limb holds 90 (or 45) degrees for full 10 seconds, 38.1% of the patients have scored 1 who had Drift; limb holds 90 (or 45) degrees, but drifts down before full 10 seconds; does not hit bed or other support, 12.7% of the patients have scored 2 who had Some effort against gravity; limb cannot get to or maintain (if cued) 90 (or 45) degrees, drifts down to bed, but has some effort against gravity, 5.9% had scored 3 who can make No effort against gravity; limb falls and 1.7% of the Patients have scored 5 who had Amputation or joint fusion.

Distribution of patients based on Motor Arm Right scale shows that 56.8% of the patients have scored 0 who had No drift; limb holds 90 (or 45) degrees for full 10 seconds, 22.9% of the patients have scored 1 who had Drift; limb holds 90 (or 45) degrees, but drifts down before full 10 seconds; does not hit bed or other support, 12.7% of the patients have scored 2 who had Some effort against gravity; limb cannot get to or maintain (if cued) 90 (or 45) degrees, drifts down to bed, but has some effort against gravity, 5.9% had scored 3 who can make No effort against gravity; limb falls and 1.7% of the Patients have scored 5 who had Amputation or joint fusion.

Distribution of Patients based on Motor Leg Left scale shows that 42.4% of the patients have scored 0 who had No drift; leg holds 30 degrees position for full 5 seconds, 37.2% of the patients have scored 1 who had Drift; leg falls by the end of the 5-second period but does not hit the bed, 12.7% of the patients have scored 2 who had Some effort against gravity; leg falls to bed by 5 seconds but has some effort against gravity, 5.9% had scored 3 who can make No effort against gravity; leg falls to bed immediately and 1.7% of the Patients have scored 5 who had Amputation or joint fusion.

Distribution of patients based on Motor Leg Right scale is clear from figure 1b that 56.8% of the Patients have scored 0 who had No drift; leg holds 30 degrees position for full 5 seconds, 22.9% of the patients have scored 1 who had Drift; leg falls by the end of the 5- second period but does not hit the bed, 12.7% of the patients have scored 2 who had Some effort against gravity; leg falls to bed by 5 seconds but has some effort against gravity, 5.9% had scored 3 who can make No effort against gravity; leg falls to bed immediately and 1.7% of the Patients have scored 5 who had Amputation or joint fusion.

Distribution of patients based on Limb Ataxia Scale also is evident from figure 1c that 44.9% of the patients did not have limb ataxia, 44.1% had ataxia in one limb, 9.3% have ataxia in two limbs and 1.7% had amputation or Joint fusion.

Distribution of patients based on sensory scale is clear from figure 1c that 44.9% of the patients are normal without sensory loss, 53.4% had mild to moderate sensory loss and 1.7% had severe or total sensory loss.

Distribution of Patients based on best language scale is also clear from figure 1c that 43.2% of the patients are normal without aphasia, 45.8%% had mild to moderate aphasia and 1.7% had mute global aphasia.

Distribution of Patients based on Dysarthria scale shows that 55.1% of the patients are normal without dysarthria, 33.9% had mild to moderate dysarthria, 9.3% had severe dysarthria and 1.7% had intubated or other physical barrier.

Distribution of Patients based on Extinction and Inattention is clear from figure 1c that 52.5% of the patients had no abnormality, 45.8% had Visual, tactile, auditory, spatial, or personal inattention, or extinction to bilateral simultaneous stimulation in one of the sensory modalities and 1.7% had Profound hemi-inattention or extinction to more than one modality; does not recognize own hand or orients to only one side of space.

Figure 2 shows the distribution of patients based on NIHSS 0.8% of the Patients have a score of 0, 0.8% have a score of 1, 4.2% have a score of 2, 21.2% have a score score of 3 25.4% have a score of 4, 5.9% have a score of 5, 21.2% have a score of 15, 9.3% have a score of 19, 1.7% have a score of 22, 3.4% have a score of 25 and 5.9% have a score of 29

Figure 2: Distribution of Patients based on NIHSS

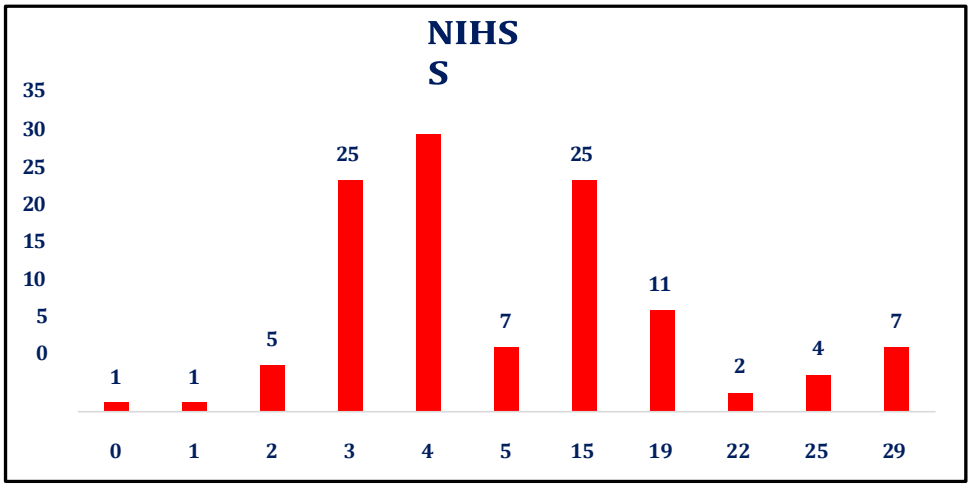

Table 4: Test of Significance of NIHSS and Uric Acid levels

	N	NIHSS		„t" value
		Mean	Std. Deviation	
Normal	69	3.493	0.9334	-24.595 Df=116 p<0.05
Elevated	49	19.000	5.1275	

Table 4 presents the test of significance of NIHSS based on Uric acid levels using Independent Sample _t' test. The NIHSS of the patients with normal Uric acid level is 3.943 ± 0.9334 whereas NIHSS of the patients with elevated levels of Uric acid is 19.000 ± 5.1275.

There is a significant difference in the NIHSS score based on level of Uric acid as depicted by the significant _t' value of -24.595.

Table 5: Distribution of patients based on Severity level of Stroke

Severity level of Stroke based on NIHSS	Frequency	Percent	Cumulative Percent
Mild (NIHSS: 1-5)	61	51.7	51.7
Mild to Moderately Severe (NIHSS:5-14)	7	5.9	57.6
Severe (NIHSS:15-24)	36	30.5	88.1
Very Severe (NIHSS >25)	12	10.2	98.3
UN = Intubated or other physical barrier	2	1.7	100.0
Total	118	100.0	

Table 5 shows the distribution of patients based on severity of level of stroke. 51.7% of the patients have mild level of stroke, 5.9% have mild to moderately severe stroke, 30.5% have severe stroke, 10.2% have very severe stroke and 1.7% have been intubated or have other physical barrier.

Table 6: Test of Significance of Severity level of Stroke and Uric Acid level

Severity level of Stroke Based on NIHSS	Uric Acid Level			Chi Square value
	Normal	Elevated	Total	
Mild (NIHSS: 1-5)	61 (100%)	0 (0%)	61 (100%)	114.225 p<0.05 df=4
Mild to Moderately Severe (NIHSS:5-14)	7 (100%)	0 (0%)	7 (100%)	
Severe (NIHSS:15-24)	0 (0%)	36 (100%)	36 (100%)	
Very Severe (NIHSS >25)	1 (8.3%)	11 (91.6%)	12 (100%)	
UN = Intubated or other physical barrier	0 (0%)	2 (100%)	2 (100%)	
Total	69 (58.4%)	49 (41.52%)	118 (100%)	

Table 6 presents the test of significance of severity of stroke with uric acid level using Chi-Square test. 100% of the patients who had mild stroke and mild to moderately severe stroke had normal uric acid level. 100% of the patients who had severe stroke had elevated levels of uric acid. 91.6% of the patients who had severe stroke had elevated levels of Uric acid. 100% of the patients who are intubated or had other physical barriers had elevated levels of Uric acid. Also there is a significant association between Uric acid level and severity of stroke as depicted by the significant Chi-Square value of 114.225.

DISCUSSION

In the present study, 30.5% of the patients belong to the age group of 51 to 60 years, 24.6% of the age group 61 to 70 years, 22.9% of the age group 41 to 50 years, 11.9% of the patients are above 70 years and 10.2% are below 40 years of age. Age, sex, and race all have a bearing on an individual's genetic risk.[6, 7]

In the present study, 63.6% of the patients are male and 36.4% are female. Similarly in a study by Mehrpour et al. 45.5% were female and 54.5% were male.[8] Similarly in the study by Tan et al. 54.54% were female.[9]

52.5% of the patients in the study group have Hypertension and 47.5% do not have hypertension. However, in a study by Shivam et al, 36.3% had Hypertension.[10]

56.8% of the patients in the study group do not smoke and 43.2% have the habit of smoking. However, in a study by Mehrpour et al. 27.3% patients had the habit of smoking.[8] But in a study by Tan et al, 25.5% had the habit of smoking.[9]

In the present study, 67.8% of the Patients do not have diabetes and 32.2% of the patients have Diabetes. Similarly in the study by Tan et al. 23.60% had Diabetes.[9] However, in a study by Mehrpour et al, only 0.2% of the patients had a known history of diabetes mellitus.[8]

68.6% of the patients are using medication and 31.4% of them do not use any medication. 89.8% of the patients are not using OAD/Insulin whereas 10.2% are using OAD/Insulin. 72.9% of the patients are using Chronic Drug whereas 27.1% are not using Chronic Drug. 58.5% of the patients have normal uric acid level and 41.5% of the patients have elevated levels of uric acid.

In the study, 66.7% of the Male and 44.2% of the female have normal uric acid level. 33.3% of the male and 55.8% of the female have elevated levels of Uric Acid. There is no significant difference in the Uric acid level based on gender as the ‗t' statistic (-0.689) is insignificant (p>0.05). The Mean Uric acid in male patients is 5.488 ± 1.2840 mg/dL and female patients is 5.649 ± 1.0964 mg/dL. But in a study by Mehrpour et al, there was a statistically significant difference in uric acid level between men and women.[8] Similarly, in the study by Shivam et al the mean uric acid level was 5.9±1.5.[10]

The results of the study show that 83.3% of the patients below 40 years of age have normal Uric acid level and 16.7% have elevated Uric acid. Among the patients between 41 and 50 years of age 92.6% have normal levels of uric acid and 7.4% have elevated levels of uric acid. 77.8% of the patients of 51 to 60 years of age have normal levels of uric acids and 22.2% have elevated levels of uric acid. In contrast, 82.8% of the patients between 61 and 70 years of age have elevated levels of uric acid and 17.2% have normal levels of Uric acids. Among the patients above 70 years of age 92.9% have elevated levels of uric acid and 7.1% have normal levels of uric acid.

In the present study, the average uric acid in the patients who are below 40 years is

5.225 ± 1.2571 mg/dL, 4.841 ± 0.8902 mg/dL in the patients who are between 41 and 50 years of age, 5.231 ± 1.0847 mg/dL in the patients who are between 51 and 60 years of age, 6.214 ± 0.8696 mg/dL in the patients who are between 61 and 70 years of age and 6.614 ± 1.4114 mg/dL in the patients who are above 70 years of age. In the present study, there is a significant difference in the level of Uric acid in the patients based on their age as depicted by significant ‗F'value of 10.553 (p<0.05). Similarly, in the study by Mehrpour et al, there was a negative relationship between age of the patients and serum uric acid level.[8]

The results of the present study show that 39.8% of the patients are Alert with a Consciousness level scale of 0, 49.2% of the patients are not alert but arousable by minor stimulation to obey, answer, or respond with a Consciousness scale of 1, 9.3% are not

alert but requires repeated stimulation to attend, or is obtunded and requires strong or painful stimulation to make movements (not stereotyped) with a Consciousness scale of 2 and 1.7% have Consciousness Scale of 3 who respond only with reflex motor or autonomic effects, or totally unresponsive, flaccid, and areflexic.
In the present study, 28.8% of the Patients have scored 0 who answered both questions correctly, 69.5% of the patients have scored 1 who answered one question correctly and 1.7% of the Patients have scored 2 who answered neither question correctly. 33.1% of the Patients have scored 0 who performed both tasks correctly, 65.3% of the patients have scored 1 who performed one task correctly and 1.7% of the Patients have scored 2 who performed neither task correctly.
The results of the study show that, 44.9% of the Patients have scored 0 who had normal gaze, 53.4% of the patients have scored 1 who had partial gaze palsy and 1.7% of the Patients have scored 2 who Forced deviation, or total gaze paresis is not overcome by the oculocephalic maneuver. 42.4% of the Patients have scored 0 who had no visual loss, 46.6% of the patients have scored 1 who had partial hemianopia, 9.3% of the patients have scored 2 who had complete hemianopia and 1.7% of the Patients have scored 3 who had bilateral hemianopia.
In the present study, 45.8% of the Patients have scored 0 who had Normal symmetrical movements, 43.2% of the patients have scored 1 who had Minor paralysis (flattened nasolabial fold, asymmetry on smiling), 9.3% of the patients have scored 2 who had Partial paralysis (total or near-total paralysis of lower face) and 1.7% of the Patients have scored 3 who had Complete paralysis of one or both sides (absence of facial movement in the upper and lower face).
It can be inferred from the present study that, 41.5% of the Patients have scored 0 who had No drift; limb holds 90 (or 45) degrees for full 10 seconds, 38.1% of the patients have scored 1 who had Drift; limb holds 90 (or 45) degrees, but drifts down before full 10 seconds; does not hit bed or other support, 12.7% of the patients have scored 2 who had some effort against gravity; limb cannot get to or maintain (if cued) 90 (or 45) degrees, drifts down to bed, but has some effort against gravity, 5.9% had scored 3 who can make No effort against gravity; limb falls and 1.7% of the Patients have scored 5 who had Amputation or joint fusion.

The findings of the study show that, 56.8% of the Patients have scored 0 who had No drift; limb holds 90 (or 45) degrees for full 10 seconds, 22.9% of the patients have scored 1 who had Drift; limb holds 90 (or 45) degrees, but drifts down before full 10 seconds; does not hit bed or other support, 12.7% of the patients have scored 2 who had Some effort against gravity; limb cannot get to or maintain (if cued) 90 (or 45) degrees, drifts down to bed, but has some effort against gravity, 5.9% had scored 3 who can make No effort against gravity; limb falls and 1.7% of the Patients have scored 5 who had Amputation or joint fusion.
In the present study, 42.4% of the Patients have scored 0 who had No drift; leg holds 30 degrees position for full 5 seconds, 37.2% of the patients have scored 1 who had Drift; leg falls by the end of the 5- second period but does not hit the bed, 12.7% of the patients have scored 2 who had Some effort against gravity; leg falls to bed by 5 seconds but has some effort against gravity, 5.9% had scored 3 who can make No effort against gravity; leg falls to bed immediately and 1.7% of the Patients have scored 5 who had Amputation or joint fusion.
In the present study, 56.8% of the Patients have scored 0 who had No drift; leg holds 30 degrees position for full 5 seconds, 22.9% of the patients have scored 1 who had Drift; leg falls by the end of the 5- second period but does not hit the bed, 12.7% of the patients have scored 2 who had Some effort against gravity; leg falls to bed by 5 seconds but has some effort against gravity, 5.9% had scored 3 who can make No effort against gravity; leg falls to bed immediately and 1.7% of the Patients have scored 5 who had Amputation or joint fusion.
The findings of the study show that, 44.9% of the patients did not have limb ataxia, 44.1% had ataxia in one limb, 9.3% have ataxia in two limbs and 1.7% had amputation or Joint fusion. 44.9% of the patients are normal without sensory loss, 53.4% had mild to moderate sensory loss and 1.7% had severe or total sensory loss. 43.2% of the patients are normal without aphasia, 45.8%% had mild to moderate aphasia and 1.7% had mute global aphasia.
The findings of the study show that, 55.1% of the patients are normal without dysarthria, 33.9% had mild to moderate dysarthria, 9.3% had severe dysarthria and 1.7% had intubated or other physical barrier. 52.5% of the patients had no abnormality, 45.8% had Visual, tactile, auditory, spatial, or personal inattention, or extinction to bilateral simultaneous stimulation in one of the sensory modalities and 1.7% had Profound hemi-inattention or extinction to more than one modality; does not recognize own hand or orients to only one side of space.
In the present study, 0.8% of the Patients have a score of 0, 0.8% have a score of 1, 4.2% have a score of 2, 21.2% have a score of 3, 25.4% have a score of 4, 5.9% have a score of 5, 21.2% have a score of 15, 9.3% have a score of 19, 1.7% have a score of 22, 3.4% have a score of 25 and 5.9% have a score of 29.
The findings of the study show that, the NIHSS of the patients with normal Uric acid level is 3.943 ± 0.9334 whereas NIHSS of the patients with elevated levels of Uric acid is 19.000 ± 5.1275. There is a significant difference in the NIHSS score based on level of Uric acid as depicted by the significant _t' value of -24.595.
In the present study, 51.7% of the patients have mild level of stroke, 5.9% have mild to moderately severe stroke, 30.5% have severe stroke, 10.2% have very severe stroke and 1.7% have been intubated or have other physical barrier. However in a study by Shivam et al., 31.3% had mild level of stroke, 51.2% had mild to moderate level of stroke, 2.5% had moderately severe stroke and 15% had severe stroke.
The findings of the study show that, 100% of the patients who had mild stroke and mild to moderately severe stroke had normal uric acid level. 100% of the patients who had severe stroke had elevated levels of uric acid. 91.6% of the patients who had severe stroke had elevated levels of Uric acid. 100% of the patients who are intubated or had other physical barriers had elevated levels of Uric acid. Also there is a significant association between Uric acid level and severity of stroke as depicted by the significant chi-square value of 114.225.

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