

Original Research Article

The study of serum uric acid in cerebrovascular accident patients and correlation with hypertension

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ABSTRACT

Background: Cerebrovascular accident (CVA) is also called Stroke. These is a well-recognized epidemiological link between elevated serum uric acid and increased cerebrovascular risk. Several studies have identified as elevated serum uric acid concentration as a predictor of cerebrovascular events. The aim of this study was to correlate serum uric acid in cerebrovascular accident (CVA) patients with Hypertension.

Methods: A prospective study was conducted on 100 patients aged >18 years of admitted with new onset focal/global neurological deficit/event with cerebrovascular accident (CVA). Brain imaging (CT/MRI) was performed on the patients within 24-48 hrs of admission. Data was collected with regards to patient's demography, medical history, risk factors for stroke or vascular disease. Serum uric acid was measured as part of fasting biochemical profile taken within 24-48 hrs of admission by standard analytical methods in Biochemistry department.

Results: Out of 100 patients included in this study 74 of them were male and 26 were female. Among 100 patients 61 patients had hemorrhage, out of which 45 (73.77%) were male and 16 (26.23%) were female, followed by 39 patients had infarct, out of which 29 (74.35%) were male and 10 (25.65%) were female. Mean value of serum uric acid levels in hypertensive patients was significantly high in comparison to normotensive patients.

Conclusions: Concluded that correlation of serum uric acid in cerebrovascular accident (CVA) patients with Hypertension was found statistically significant.

Keywords: Cerebrovascular accident, Hypertension, Stroke, Uric acid

INTRODUCTION

Cerebrovascular accident (CVA) or stroke is a worldwide health problem. It makes an important contribution to morbidity, mortality and disability in developed as well as developing countries. Patients with hyperuricemia often have other well-established risk factors for cerebrovascular disease such as hypertension, renal disease, obesity, dyslipidemia, and insulin resistance. Hypertension was the most important risk factor. Stroke represented 1.2% of total deaths in India.¹ It has been observed that around 84% patients of acute stroke have elevated blood pressure on admission.² Meta-analysis of various trials found a linear relationship between high

blood pressure and risk of stroke (a 7.5 mm rise in diastolic blood pressure may double the likelihood of stroke).^{3,4} Extreme elevation in B.P. with slow decline is more often associated with cerebral hemorrhage than infarction.⁵ Raised serum uric acid concentrations in the blood are commonly encountered in essential hypertension. Although the raised serum uric acid and episodes of gout are occasionally attributable to therapy, asymptomatic hyperuricemia not infrequently precedes the diagnosis and treatment of essential hypertension. Hypertensive people with raised serum uric acid had a significantly higher relative risk (RR) for both heart attack and stroke, that hyperuricemia in hypertension may be an early indicator of hypertensive cardiorenal disease,

which is commonly associated with a multimetabolic syndrome.⁶ A direct association exists between serum uric acid and renal vascular resistance in subjects with essential hypertension.⁷ Hyperuricemia also predicts stroke in diabetic and nondiabetic subjects and predicts the development of hypertension and renal disease in the general population.⁸

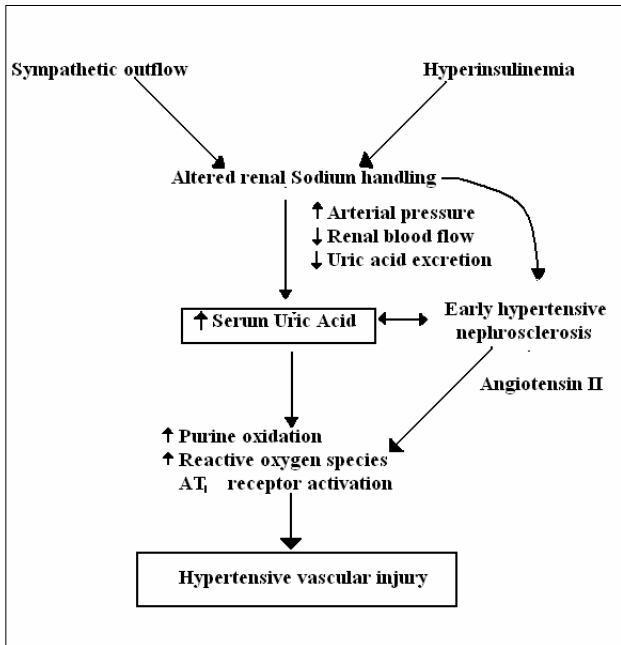


Figure 1: Interaction between renal pathophysiology of hypertension and uric acid.

METHODS

A prospective study was conducted in department of Medicine and Neurology, Gwalior on patients aged >18 years of admitted with new onset focal/global neurological deficit/event for a period of 2 years from 2008 to 2010. Brain imaging (CT/MRI) was performed on the patients within 24-48 hrs of admission.

Data was collected with regards to patient’s demography, medical history, risk factors for stroke or vascular disease. Serum uric acid was measured as part of fasting biochemical profile taken within 24-48 hrs of admission by standard analytical methods in Biochemistry department.

Inclusion criteria

All patients above the age of 18 yrs with cerebrovascular accident (CVA) admitted in medicine and neurology department JAH Gwalior.

Exclusion criteria

Age <18 yrs, Patient with bleeding disorder and on anticoagulant drug, Renal insufficiency, Polycystic kidney disease, Hemolytic processes, lymphoproliferative

disease, myeloproliferative disease, polycythemia vera, psoriasis, paget’s disease, rhabdomyolysis, cytotoxic therapy for malignancy, Disease with rise serum uric acid concentration, Valvular heart disease.

Data analysis

Data analysis was done by software EPICAL and p value are measured in all statistics by student T test. P value <0.05 was considered significant.

RESULTS

Table 1 shows, out of 100 patients included in this study 74 of them were male and 26 were female. Among 100 patients 61 patients had hemorrhage, out of which 45 (73.77%) were male and 16 (26.23%) were female, followed by 39 patients had infract, out of which 29 (74.35%) were male and 10 (25.65%) were female.

Table 1: Distribution of ischemic and hemorrhagic stroke according to gender.

Type of stroke (n=100)	Males (n=74)	Females (n=26)
Number of cases (%)		
Ischemic (n=39) 39%	29(74.35%)	10(25.65%)
Hemorrhage (n=61) 61%	45(73.77%)	16(26.23%)
Total	74(100%)	26(100%)

Table 2 depicts, out of 100 patients of cerebrovascular accidents, 16 patients were normotensives, while 84% were hypertensives. Mean value of serum uric acid levels in hypertensive patients was significantly high in comparison to normotensive patients (p <0.05).

Table 2: Uric acid levels compared between patients blood pressure levels.

Blood pressure at the time of admission	BP<140 and/or 90 (n=16)	BP<140 and/or 90 (n=84)
Mean serum uric acid ±SD	7.25±2.6	8.93±2.7
Median range	7.8(3.3-13.7)	9(1.1-15)

DISCUSSION

Cerebrovascular accidents (CVA) have very high morbidity, mortality and recurrences.⁹ In various studies it was shown that serum uric acid is associated with the myocardial infarction, cardiac failure, increased death in myocardial infarct patients and association with CVA and its recurrence.¹⁰⁻¹³ Out of 100 patients included in this study 74 of them were male and 26 were female. Among 100 patients 39 patients had infract and 61 patients had hemorrhage. Statistically significant differences was present in mean values of serum uric acid level in patients

of stroke present with hypertension. This finding was concordant with previous study.¹⁴⁻¹⁶

CONCLUSION

The study entitled “The study of serum uric acid in cerebrovascular accident (CVA) patients and correlation with Hypertension” was a prospective study for a sample of 100 patients of cerebrovascular accident (CVA) revealed that Mean value of serum uric acid levels in hypertensive patients was significantly high in comparison to normotensive patients were statistically significant found.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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