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Determining correlation of serum uric acid and Lipid levels in Female patients of Acute Ischemic stroke

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A B S T R A C T

Background: Stroke is a growing disease and it is the second common cause of death in the world after coronary heart disease. In patients with acute stroke hyperuricemia was significantly higher than normal population with associated dyslipidemia..Female sex is still an independent predictor ofpoor prognosis even when adjusting for other predictors of functional outcome.
Aim: Serum uric acid levels and serum lipid levels in female patients with ischemic cerebrovascular accident**.**
Material and Methods: This was a cross-sectional study carried out between July 2019 – September 2019, which included 44 female cases of acute ischemic stroke. Serum uric acid levels and serum lipid levels was done in all the patients and was statistically analyzed.
Result:Among the 44 female patients, 33 (75%) were postmenopausal and 11(25%) werepremenopausal. The mean age in study was 58.09±15.23.
Hyperurecimic patients were higher inpostmenopausal women as compared to premenopausal The study showed that patients were withboth dyslipidemia and hyperuricemia.The positive correlation was present between serum uric acid level and Total Cholesterol, Triglyceride, LDL level. The negative correlation was present between serum uric acid level and HDL level. The patients with decreased HDL with Hyperuricemia were 15.90% (7 out of 44).
Conclusion: Hyperuricemia and its accompanying dyslipidemia can be considered as the risk factor for acute ischemic stroke.

Keywords: Stroke, Cerebrovascular accident , hypertension, lipid profile, serum uric acid , triglycerides, female stroke , acute ischemic stroke, acute female ischemic stroke.

INTRODUCTION

A stroke or cerebrovascular accident is defined as an abrupt onset of a neurologic deficit that is attributable to a focal vascular cause. Stroke is the second most frequent cause of death in the world.[(1).]Hyperuricemia has been reported to be an independent predictor of stroke.[2]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.[3] It is well proven by epidemiological studies that high LDL –C and low HDL-C are associated with cardiovascular disease.[3]Uric acid increase platelet adhesiveness, stimulates mononuclear cell to produce IL – 1Beta , IL-6 , TNF – alpha , and in vascular wall to produce monocyte chemoattractant protein – 1. Uric acid stimulates proliferation of vascular smooth muscle cell. Uric acid stimulates proliferation of vascular smooth muscle cell and cause synthesis of thromboxane and PDGF due to is activation of specific protein kinase and transcription factor. Hyperuricemia may be involves in pathogenesis of Hypertension and renal failure due to activation of Renin Angiotensin system and development of microvascular disease, endothelial dysfunction.Serum Uric Acid level was found to a independent predictor in women for cardiovascular risk[(4-7)].Women suffer worse outcomes from the disease, although the incidence of stroke was greater among men,[(8)]

OBJECTIVES: -

1. To assess level of serum uric acid and lipid levels in female patients of acute ischemic stroke.

2. To determine the correlation between serum uric acid and lipid levels in female patients of acute ischemic stroke.

METHODOLOGY

Study design:- Observational and cross-sectional study

Study areaHamidia Hospital and Gandhi Medical College, Bhopal.Study duration:August and October 2019.SampleSize:-44 female patients. Study population:All female patients admitted at hospital with Acute Ischemic Stroke,diagnosed by CT/MRI of brain is selected in our study.

Inclusion Criteria

- All female patients diagnosed as Acute Ischemic Stroke admitted at Medicine department of hospital.

Exclusion Criteria

- Age < 18 years
- Female patients with chronic intake of hyperuricemic drugs or Oral Contractive Pills
- Female patients with conditions which alter serum uric acid levels(lymphoproliferative disease , polycythemia,myeloproliferative disorders, diabetic ketoacidosis , lactic acidosis)
- Female patients with hemorrhagic stroke.
- Pregnant females.

Study method:

All the female patient of Acute Ischemic Stroke diagnosed by CT/MRI of brain was selected for the study, admitted in medicine ward. The detailed history, general examination and investigations of patient was conducted.

They were be further divided into two groups-

Premenopausal and post menopausal females.

The 9 hour fasting blood sample for investigations was collected by taking universal aseptic precaution.Serum Uric acid level,Lipid profile levels

Statistical Analysis

All Characteristics were summarized descriptively. For continuous variables, the summary statistics of N, mean, standard deviation (SD) were used. Data were analyzed using SPSS software v.25.0. The ANOVA test was applied when required.

RESULTS

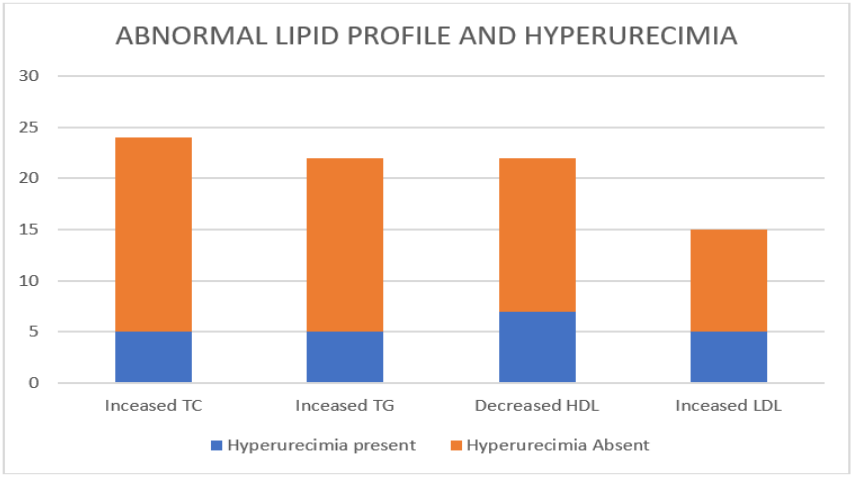
Among the 44 female patients, 33 (75%) were postmenopausal and 11(25%) were premenopausal. The mean age in study was 58.09±15.23. The mean age in postmenopausal women 65.84±7.14 and premenopausal women was 34.81±6.3. The most number of patients were from age group 56-75 i.e 27 (61.36%).Hyperurecimic patients were higher in postmenopausal women as compared to premenopausal women.The mean serum uric acid level was higher in hypertensive females than normotensive females, but it was not statistically significant.The mean HDL level in patients studied was 48.36±10.03 mg/dl.The mean HDL of Postmenopausal women was 47.67 ±11.57 mg/dland Premenopausal women 50.45±11.57 mg/dl. The mean LDL level in patients studied was 123.94±37.78mg/dl. The mean LDL of Postmenopausal women LDL was 127.32 ± 34.49 mg/dl and Premenopausal women 118.54±50.79 mg/dl.The positive correlation was present between serum uric acid level and Triglyceride, LDL level,TotalCholesterol.The negative correlation was present between serum HDL leveland serum uric acid level.The patients with decreased HDL with Hyperuricemia were 15.90% (7 out of 44). The p value (0.046) was found statistically significant between decreased HDL and Hyperuricemic Patients. The correlation between Triglyceride level and Serum uric acid level was found to be statistically significant (p = 0.049).The correlation between patients of hyperuricemia and abnormal lipid profile. More than 1 lipid parameter was deranged in 31(70.45%) patients (25(56.81%) postmenopausal and 6(13.63%) premenopausal women). In our study the patients with increased Total Cholesterol were 24(54.54%), increased Triglyceride 22(50%), decreased HDL 22(50%), increased LDL 15(34.09%).

The patients with increased Total Cholesterol (TC) in which hyperuricemia was present was 11.36% (5 out of 44). The patients with increased Triglyceride (TG) in which hyperuricemia was present was 11.36% (5 out of 44). 8 patient had both higher level of uric acid level and dyslipidemia. The p value (0.046) was found statistically significant between decreased HDL and Hyperuricemic Patients). All 8 patients with hyperuricemia also had accompanied dyslipidemia.

Table 25:ABNORMAL LIPID PROFILE AND HYPERURECIMIA

LIPID PROFILE	HYPERURICEMIA			p value
	PRESENT	ABSENT	TOTAL	
INCREASED TC	5(11.36%)	19(43.18%)	24(54.45%)	0.617
INCREASED TG	5(11.36%)	17(38.63%)	22(50%)	0.434

DECREASED HDL	7(15.90%)	15(34.09%)	22(50%)	0.046(Sig)
INCREASED LDL	4(9.09%)	11(25%)	15(34.09%)	0.294



DISCUSSION

In our study out of the 44 patients, 23(52.27%) were hypertensives and the rest 21(47.72%) were normotensives. Out of 33 postmenopausal patients, 20(66.67%) were hypertensive patients and out of 11 premenopausal women, 3(27.72%)were hypertensive.Bowling M et al[9] showed in study found that increased age was associated with increase hypertension. After menopause, BP rises in most women. Its has been postulated that after menopause, due to withdrawl of estrogen, a potent vasoldilator is the cause of postmenopausal hypertension.

Hyperuricemic patients were higher in postmenopausal women as compared to premenopausal women. Taher R et al [10] showed that association of higher uric acid level with endothelial dysfunction in females.As in Stöckl D et al.[11]cross-sectional analysis, data of 1530 women aged 32 to 81 years participating in the KORA F4 study, Menopausal status and earlier age at menarche were associated with higher serum uric acid levels. In our study it may not be statistically significant due to small sample size.

The mean Triglyceride level in patients studied was 164.52±51.27 mg/dl.The mean Triglyceride of Postmenopausal women was 171.42±52.57 and Premenopausal women was143.81±42.80. The mean HDL level in patients studied was 48.36±10.03 mg/dl.The mean HDL of Postmenopausal women was 47.67±11.57 and Premenopausal women 50.45±11.57.

Wang N et al[12]Showed that the postmenopausal female had higher dyslipidemia than premenopausal females. (69.7%vs. 24.3%(752/3 094). In our study the dyslipidemia was seen in 38(86.36%) patients (postmenopausal were 30(68.18%) and premenopausal were 8(18.18%). More than 1 lipid parameter was deranged in 31(70.45%) patients 25(56.81%) postmenopausal and 6(13.63%) premenopausal women. In our study the patients with increased Total Cholesterol were 24(54.54%), increased Triglyceride 22(50%) , decreased HDL 22(50%) , increased LDL 15(34.09%). The study showed that 8(18.18%) patients were with both dyslipidemia and hyperuricemia.Arora T et al.[13]conducted the study which included 60 paticipants of ischemic stroke, 71.7% were males and 28.3%females were included in their study. The mean age of the patients studied by them was 63.2 ±14.

In study dyslipidemia was seen in 81.7% patients (36 Males and 13 females). Study has the age group mainly of 56-70 age. About 10 male patients and 4 female patients, had more than 1 dearranged lipid parameter. Of them 87.75% of patients had low HDL levels. About one third (about 36.73%) had higher Serum Cholesterol. The study showed a significant correlation between decreased HDL and Hyperurecimia in patients as seen in our study.

Bhadra J et al.[14] evaluated 38 patients with mean age 59.28±12.31.Statistically significant coorelation found with Triglyceride and higher uric acid level. Howeverserum HDL and uric acid have shown Inverse Coorelation. Serum uric acid levels were significantly higher in Patients.

Baluch U et al[15]had studied 53 patients of which 32 were males and 21 were females.In the result, significant statistics were found as19%patient had dyslipidemia of them, 18% had low HDL, triglycerides were observed in

32%.AlbucherJF[16] et al concluded that out of the various lipid profile levels, only low serum HDL levels are shown to be increased risk of stroke in population.

CONCLUSION:

The lipid levels and serum uric acid level are the cheap and one of the routine investigations to be performed among individuals. The Lipid level and uric acid level are the modifiable risk factor. Hence can be altered by lifestyle modification or pharmacological drug applicationThe dyslipidemia and serum uric acid level can be considered as a risk factor for acute ischemic stroke, in female especially postmenopausal.

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