A STUDY OF SERUM URIC ACID LEVELS IN PREECLAMPSIA

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ABSTRACT

Background: *The present study concentrate to get significant association of serum uric acid levels with pre-eclampsia and PIH and also between serum uric acid and severity of disease.*
Material and Methods: *80 Patients diagnosed as having Pre-eclampsia and 80 controls with similar age group were studied after taking their consent. Blood samples were collected under aseptic precautions in plain vacutainer for serum uric acid estimations. Uric acid estimation was done by Uricase Peroxidase Method on Fully Automated Biochemistry Analyzer Miura 300.*
Results: *The observed mean serum uric acid levels in preeclampsia was 7.52±0.77 mg/dl as compared to 3.70±0.94 mg/dl in controls.*
Conclusion: *High serum uric acid levels could be a useful indicator of the maternal and fetal complication in hypertensive patients.*

INTRODUCTION

The present study concentrates to get significant association of serum uric acid levels with pre-eclampsia and PIH and also between serum uric acid and severity of disease.

The increase in uric acid level appears to coincide with the increase in the blood pressure and proceed the development of proteinuria. Uric acid levels have been used for early diagnosis of pre-eclampsia. A disproportionate fall in uric acid clearance is a key feature of preeclampsia. The serum level of uric acid rises as preeclampsia progresses; a level >5.5 mg/dL is a strong indicator of the disease and a level >7.8 mg/dL is associated with significant maternal morbidity. The degree of uric acid elevation correlates with the severity of proteinuria and renal pathological changes, and with fetal demise. Recent studies suggest that hyperuricemia may also play a pathogenic role by contributing to the vascular damage and hyper-tension.

H. Pasoaglu et al (2004) studied Nitric acid (NO) and Uric Acid (UA) levels along with lipids peroxides in 40 preeclamptic women and 25 eclamptic women and noted significant in all three parameters indicating them to be directly related to the severity of disease and thus may have diagnostic significance. Magna Manjareeka et al (2012) studied elevated levels of serum uric acid and creatinine or urea in preeclamptic women involving 105 age – matched women of South India, all in their third trimester singleton Pregnancy found that the levels of serum uric acid were significantly elevated in preeclamptics thus precludes it to be useful for consideration as consistent predictive indicator for preeclampsia or pregnancy related hypertension. S. V. Kashinakunti et al studied Lipid Peroxidation and Antioxidant Status in Preeclampsia taken case control study consisting of 30 preeclamptic and 30 healthy pregnant women where he found Uric Acid level in serum increased significantly($p<0.001$).

MATERIAL AND METHOD

80 Patients diagnosed as having Pre-eclampsia with age between 18-37 years and 80 controls with similar age group were studied at SSG Hospital, Vadodara, after taking their consent. Blood samples were collected under aseptic precautions in plain vacutainer for serum uric acid estimation. Out of 80 patients, 26 were diagnosed as mild preeclampsia, 22 were labelled as severe preeclampsia and 32 patients were found with PIH. Patients with history of renal disease, chonic hypertension, cardiovascular disease, thyrotoxicosis, liver disease were excluded. Serum samples were analyzed for following parameters by MIURA-fully automated biochemistry analyzer.

Uric acid estimation was done by Uricase Peroxidase Method. Serum urea

and creatinine, Serum electrolytes (Na+ & K+), serum ALP, ALT, AST, albumin, total and direct bilirubin to rule out renal & liver disease.

RESULT AND DATA ANALYSIS

The study was conducted at, SSG Hospital & Medical College Baroda, to estimate serum uric Acid levels in 80 Patients suffering from preeclampsia and PIH and in 80 controls

All the statistical calculations were performed using statistical software MedCalc®v11.5.0.

Table 1: Mean age of patients and controls

Age (years)	GROUP	NO	Mean	Std. Deviation
	Case	80	26.03	2.73
	Control	80	24.55	2.95

Table 1(a): Shows the mean serum Uric acid levels in patients and controls

Parameter	Group	N	Mean	Std. Deviation	Std. Error Mean	p-value
Serum Uric Acid (mg/dl)	Case	80	7.52	0.77237	0.08635	p < 0.0001
	Control	80	3.7012	0.94393	0.10554	

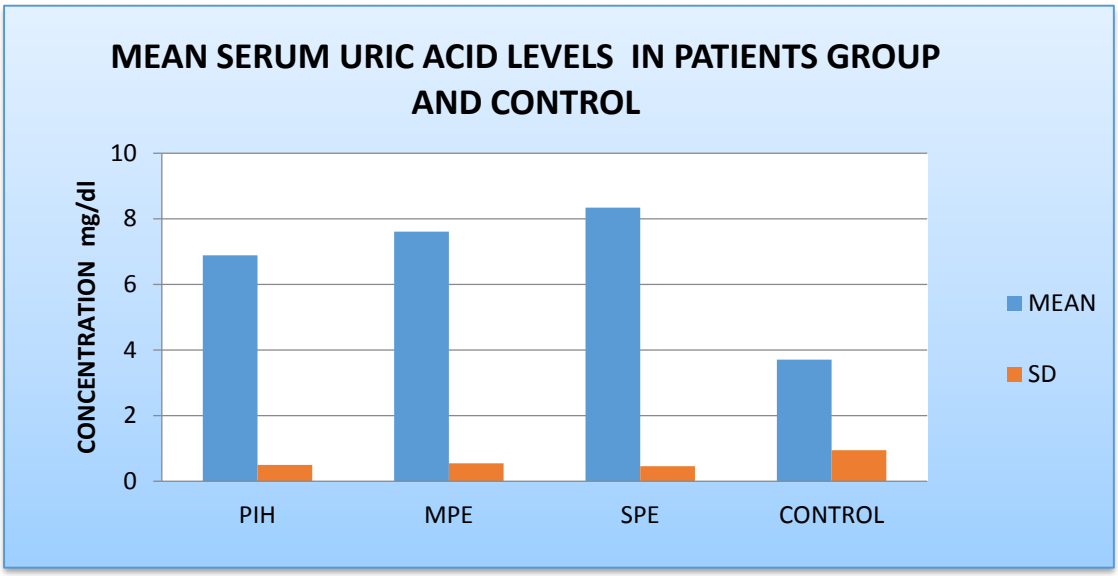
Table 1(b): Shows means serum uric acid levels in different patients groups

Parameter	Cases	No.	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Mini-mum	Maxi-mum
						Lower Bound	Upper Bound		
Serum Uric Acid (mg/dl)	PIH	32	6.8906	0.49862	0.08814	6.7109	7.0704	6.0	7.5
	MPE	26	7.6038	0.54661	0.1072	7.3831	7.8246	6.1	8.9
	SPE	22	8.3364	0.45934	0.09793	8.1327	8.54	7.4	8.9
	Total	80	7.52	0.77237	0.08635	7.3481	7.6919	6.0	8.9

Table 1(c): Independent samples t-test for patients and controls

Parameter	Equal variances assumed	t-test for Equality of Means				
		T	df	p-vlaue	Mean Difference	Std. Error Difference
Serum Uric Acid(mg/dl)		28.004	158	p < 0.0001	3.81875	0.13636

Graph-1: show mean serum Uric acid in patients group and control



DISCUSSION

In the present study, 74% were primigravidas and 26% were multigravidas. The mean age of our patients was 26.03±2.73 year with range of 18-37 year and the mean gestational age 34.48±3.52 years.

In normal pregnancy, serum uric acid level slowly decreases until about 16 weeks of gestation, secondary to plasma volume expansion, increased renal clearance, and the uricosuria effect of estrogen. For most of the 2nd trimester, the uric acid level remains stable, and then increases during the 3rd trimester because of increase catabolism/- production. Uric acid is one of the most sensitive indicators of the disease severity in pregnancy induced hypertensive disorders and can be of great help in monitoring the cause of disease process .In preeclampsia, uric acid level has been known to be increased and to correlate with maternal and fetal morbidity, but always has been assumed to be a reflection of disease rather than a cause and it has antioxidant properties that serve to protect from oxidative stress, but it also appears to contribute directly to endothelial dysfunction by its proinflammatory effects, as well as to hypertension during preeclampsia.

In the present study, estimation of serum uric acid levels were measured in patients with pregnancy induced hypertension & preeclampsia and in normal pregnant women. Serum uric acid levels in preeclampsia and PIH patients were found to be significantly higher as compared to controls group($p < 0.0001$).The observed mean serum uric acid levels in mild preeclampsia ,severe preeclampsia and PIH patients the mean serum uric acid values were 7.60±0.54 mg/dl, 8.33±0.45 mg/dl and 6.89±0.49 mg/dl respectively as compared to controls which was 3.70±0.94 mg/dl .The observation showed significant difference between the two forms of preeclampsia i.e. Mild and severe preeclampsia and PIH suggesting uric acid to be a good marker of severity of disease .

CONCLUSION

Serum uric acid levels were significantly higher in both preeclampsia and PIH patients & could be a useful indicator of the maternal and fetal complication in hypertensive patients.

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