LEVEL OF SERUM URIC ACID IN PREECLAMPSIA

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ABSTRACT:

Background: *Uric acid is the final product of the purine metabolism in humans. The 2 final reactions in its production which catalyze the conver-sion of hypoxanthine to xanthine and the latter to uric acid are catalyzed by the enzyme xanthine oxidoreductase. The role of uric acid in the progression of prediabetes to diabetes has been known. Serum uric acid has been shown to be associated with cardiovascular disease, hypertension, and chronic kidney disease.*

Aims & objectives: *The present study was done to see the level of uric acid in preeclampsia and regnancy induced hypertension (PIH) patients.*

Material and Methods: *The study involves 50 cases of preeclamsia of age group between 20-35 year and 50 controls with similar age group.Srum uric acid was done from all subjects by uricase method in semi-automated biochemistry analyser after centrifugation of samples.*

Results: *The observed mean serum uric acid levels in preeclampsia was 7.48±0.59 mg/dl as compare to 4.12±0.59 in control group. The difference between them is highly significant because p-value is less than 0.05.*

Conclusion: *High serum uric acid level could be a useful indicator of the maternal and fetal complication.*

Key words: *Uric acid, Preeclampsia, Pregnancy*

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[1].

Although uric acid can act as an antioxidant, excess serum accumulation is often associated with cardiovascular disease. It is not known whether this is causative (e.g., by acting as a prooxidant) or a protective reaction taking advantage of urate's antioxidant properties. The same may account for the putative role of uric acid in the etiology of stroke Uric acid can act as a prooxidant and it may thus be a marker of oxidative stress, but it may also have a therapeutic role as an antioxidant[2].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. [3]

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.[4] 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[5]. 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($p<0.001$) [6].

MATERIAL AND METHOD

50 Patients diagnosed as having Pre-eclampsia with age between 20-35 years and 50 controls with similar age group were studied at index medical college Hospital & research centre, Indore, m.p, india, after taking their consent. Blood samples were collected under aseptic precautions in plain vacutainer for serum uric acid estimation. Out of 50 patients, 15 were diagnosed as mild preeclampsia (MPE), 15 were labelled as severe preeclampsia (SPE) and 20 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 semi-automated bio-chemistry 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 index medical college Hospital & research centre, Indore, m.p, india. The serum uric Acid levels are measured in in 50 Patients of age group 20-35 year suffering from preeclampsia and PIH and in 50 age matched controls. Data obtained was analysed statically by using online student t-test calculator. p-value less than 0.05 was consider as a significant.

DISCUSSION

In the present study, 74% were primigravidas and 26% were multigravidas. The mean age of our patients was 28.09±2.3 year with range of 20-35 year and the mean gestational age 34.48 ± 3.52 weaks.

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 uricosuric 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 proinfla-mmatory effects, as well as to hypertension during preeclampsia.

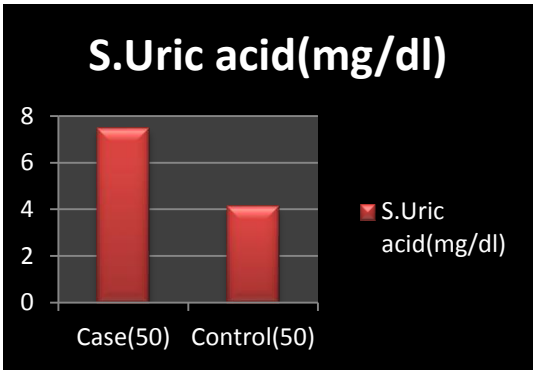
In the present study, estimation of serum uric acid levels were measured in patients with pregnancy induced hypertension & preeclampsia and in normal pregnant women. Serum uric acid levels in preeclampsia and PIH patients were found to be significantly higher as compared to controls group ($p < 0.0001$). The observed mean serum uric acid levels in mild preeclampsia, severe preeclampsia and PIH patients the mean serum uric acid values were 7.23±0.83 mg/dl, 8.59±0.58 mg/dl and 6.63±0.51 mg/dl respectively as compared to controls which was 4.12±0.65 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.

Table 1: Mean age of Case and control Group

Group	Mean Age(yr)	Number(n)
Case	28.09± 2.3	50
Control	27.39 ± 2.9	50

Table 2: Shows the mean serum Uric acid levels (mg/dl) in patients and controls

Group	Number (n)	S. Uric acid level (mean SD)	P-value
Case	50	7.48± 0.59	<0.01
Control	50	4.12 ± 0.65	



Graph 1: Graphical presentation of Mean S.uric acid (mg/dl) in case group and control group

Table 3: Shows means serum uric acid levels in different patients groups

Parameter	Cases	Number (n)	S.uric acid level (mean ± SD)
S.Uric acid (mg/dl)	Mild preeclampsia (MPE)	15	7.23± 0.83
	Sevour preeclampsia (SPE)	15	8.59± 0.58
	Pragnancy induced hypertension (PIH)	20	6.63± 0.51

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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