

A Study of Serum Uric Acid Levels in Preeclampsia

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Abstract

Background: Pre-eclampsia is still one of the most important causes of maternal and foetal mortality. The aetiology of preeclampsia still remains unexplained. Though endothelial dysfunction is considered to play a central role in pathophysiology of it.

Methods: 50 Patients diagnosed as having Pre-eclampsia with age between 18-37 years and 50 controls with similar age group.

Results: The mean serum uric acid level in control group was 3.40 ± 0.92 and in patient 7.50 ± 0.70 which was statistically significant ($p < 0.05$).

Conclusion: Serum uric acid levels were significantly higher in preeclampsia could be a useful indicator of the maternal and fetal complication in preeclampsia patients.

Keywords: serum uric acid, preeclampsia, laboratory.

Introduction

Pre-eclampsia is still one of the most important causes of maternal and foetal mortality. The aetiology of preeclampsia still remains unexplained. Though endothelial dysfunction is considered to play a central role in pathophysiology of it.¹⁻² There was no screening test reliable enough to diagnose pre-eclampsia. Uric acid is one of the most sensitive indicators of disease severity in

pregnancy induced hypertensive disorders and can be of great help in monitoring the cause of disease process. Several studies have demonstrated a correlation between elevated maternal serum uric acid and adverse maternal and foetal outcome.³⁻⁴ Uric acid is a product of purine degradation catalysed by the enzyme xanthine oxidase. In normal pregnant women serum uric acid concentration initially falls 25-30% due to elevation in renal clearance secondary to increased GFR or reduced proximal tubular reabsorption due to changes in its production rate. Later in pregnancy the serum uric acid levels increase due to foetal production, decreased uric acid clearance and decreased binding to albumin.⁵⁻⁶ Uric acid is filtered, reabsorbed and secreted by the kidney. The most commonly accepted explanation for hyperuricemia is increased reabsorption and decreased excretion of uric acid.

Material and Method

50 Patients diagnosed as having Pre-eclampsia with age between 18-35 years and 50 controls with similar age group.

Blood samples were collected under aseptic precautions in plain vacutainer for serum uric acid estimation.

Patients with history of renal disease, chronic hypertension, cardiovascular disease, thyrotoxicosis, liver disease were excluded.

After obtaining informed written consent from all the study subjects relevant data were documented in a predefined data sheet and blood samples were collected from study subjects for estimation of serum uric acid levels.

Uric acid estimation was done by Uricase Peroxidase Method.

Results

Table 1: Shows the mean serum Uric acid levels in patients and controls.

Serum uric acid level	Case	Control
Mean	7.52	3.43
SD	0.64	0.84
p-value	<0.05	

The mean serum uric acid level in control group was 3.43 ± 0.84 and in patient 7.52 ± 0.64 which was statistically significant ($p < 0.05$).

Discussion

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 ($p < 0.05$). The observed mean serum uric acid levels in preeclampsia and PIH patients the mean serum uric acid values were 7.52 ± 0.64 mg/dl as compared to controls which was 3.43 ± 0.84 mg/dl. A similar conclusion was drawn by Odegard et al where they showed nulliparity as a risk factor of pre-eclampsia.⁷

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.

Conclusion

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

References

1. Sibai BM, Gordon T, Thom E. Risk factors for preeclampsia in healthy nulliparous women. *Am J Obstet Gynecol.* 1995;172:642-8.
2. Dekker GA, Sibai BM. Etiology and pathogenesis of pre-eclampsia. *Am J Obstet Gynecol.* 1998;179(5):1359-75.
3. Soomro N, Shazia. Serum uric acid as a predictor model for pre-eclampsia. *Pak J Surg.* 2010;26(3):246-51.
4. Lancet M, Fisher IL. The value of blood uric acid in toxemia of pregnancy. *J Obstet Gynecol.* 1956;63:116-9.

5. Powers RW, Bodnar LM, Ness RB. Uric acid concentration in early pregnancy among preeclamptic women with gestational hyperuricemia of pregnancy. *Am J Obstet Gynecol.* 2006;194:160.
6. Many A, Hubel CA, Roberts JM. Hyperuricemia and xanthine oxidase in pre-eclampsia. *Am J Obstet Gynecol.* 1996;174:228-91
7. Odegard RA, Vatten LJ, Nilsen ST, Salvasen KA, Austgulen R. Risk factors and clinical manifestations of pre-eclampsia. *Br J Obstet Gynecol.* 2002;107:1410-6.