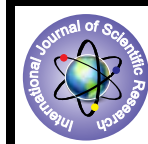


Correlation of Serum Uric Acid and Blood Pressure in Preeclampsia



Medical Science

KEYWORDS : Uric acid, preeclampsia, hypertension blood pressure

* Raghuvveer singh solanki

Demonstrator Biochemistry, GMCH, Udaipur, Rajasthan * Corresponding Author

Ravi Shankar choudhary

Demonstrator Biochemistry, GMCH, Udaipur, Rajasthan

Ajay kumar Bhargava

Professor Biochemistry, Jhalawar Medical college, Jhalawar, Rajasthan

V.D. Bohra

Professor Biochemistry, Jhalawar Medical college, Jhalawar, Rajasthan

ABSTRACT

Introduction: woman with chronic hypertension also manifests evidence of preeclampsia, this is classified chronic hypertension with superimposed preeclampsia.

Material & method: The study was conducted in the department of Biochemistry, Jhalawar medical college on 50 subjects and 50 controls.

Result: There was found a significant positive correlation between serum uric acid levels and systolic blood pressure and diastolic blood pressure among cases.

Conclusion: uric acid is a good predictor for pregnancy induced hypertension in preeclampsia.

Introduction:

The hypertensive disorders of pregnancy include hypertension that antedates pregnancy, chronic hypertension, and gestational hypertension occurring uniquely during pregnancy. When the gestational hypertension is accompanied by new-onset proteinuria, the disorder is termed preeclampsia and when not associated with proteinuria, it is called transient hypertension of pregnancy. If the woman with chronic hypertension also manifests evidence of preeclampsia, this is classified chronic hypertension with superimposed preeclampsia. Eclampsia is the occurrence of seizures in women with preeclampsia.¹

Several medical conditions, such as chronic hypertension, diabetes mellitus, renal disease, and hyper coagulable states are associated with increased preeclampsia risk.²

Women with a history of preeclampsia in a prior pregnancy, are at increased risk of developing preeclampsia in future pregnancies³ In developing countries, where inadequate prenatal care limits preeclampsia surveillance, maternal mortality is common, accounting for 50 000 deaths per year⁴

Preeclampsia is a syndrome, universally defined by the onset of hypertension ($\geq 140/\geq 90$ mmHg) and proteinuria (≥ 0.3 g/24 h) after 20 weeks of gestation in a previously normotensive woman that also may be associated with myriad, other signs and symptoms, and often with subnormal fetal growth⁵

Elevated uric acid is another component of the preeclampsia syndrome that was recognized many years ago. It is one of the most consistent and earliest detectable changes in preeclampsia and has been cited as a better predictor of fetal risk than blood pressure⁶ This results from decreased uric acid clearance from diminished glomerular filtration, elevated tubular reabsorption and decreased secretion.⁷

Hyperuricemia due to oxidative stress is known to be associated with deleterious effects on endothelial dysfunction, oxidative metabolism, platelet adhesiveness, hemorrheology and aggregation.⁸ Hence elevated serum uric acid is

highly predictive of increased risk of adverse maternal and fetal outcome.⁹

In the present study we were tried to established the correlation between blood pressure and uric acid in these women in area of jhalawar, Rajasthan.

Material and Methods:

The present study was conducted on 50 subjects with preeclampsia as well as 50 normal pregnant healthy controls. The study was conducted in the department of Biochemistry, Jhalawar medical college. The subjects were selected from OPD and indoor patients Department of Obstetrics and Gynaecology of SRG hospital, Jhalawar.

Five ml blood was collected in plain vials from the subjects and serum were separated. Then Estimation of serum Uric acid were done by ERBACHEM semi autoanalyzer by uricase method .¹⁰

Statically analysis :

The statistical analysis was performed using analysis of variance (ANOVA) test which is confined not only for comparing two sample means, but more than two samples drawn from corresponding controls. The results are expressed as mean \pm standard deviation. $P < 0.001$ was considered as statistically highly significant.

Results:

Comparison of Systolic Blood Pressure between cases and controls are shown in the Table and graphically represented in fig.1, The mean value of systolic

blood pressure among cases as compared to controls was statistically highly significant. (p value $< .001$). Comparison of Diastolic Blood Pressure between cases and controls are shown in the Table. The mean value of diastolic blood pressure among cases as compared to controls was statistically highly significant. (p value $< .001$)

Comparison of serum Uric acid levels between cases and controls are shown in the Table 1. The mean serum uric acid levels are higher among preeclampsia cases as Com-

pared to controls. The difference is statistically highly significant (p value < .001)

Correlation between systolic blood pressure levels with uric acid levels among cases are shown in Table 2 and graphically represented in fig.2 There is a positive correlation and this is a statistically significant (r = 0.306, p <0.05) between systolic blood pressure levels and uric acid.

Correlation between diastolic blood pressure levels with uric acid levels among cases are shown in Table 2 and graphically represented in fig.3. There is a positive correlation and this is a statistically significant (r = 0.315, p <0.05) between diastolic blood pressure levels and uric acid.

Table No.-1

Mean + Sd of systolic blood pressure (SBP), diastolic blood pressure (DBP) and uric acid of the Case & Control group Subjects

	Mean ± Sd		p-value	Significance
	Case	Control		
SBP	153.10 ± 5.74	128.02 ± 5.24	< .001	HS
DBP	99.42 ± 5.14	82.62 ± 3.75	< .001	HS
UA	10.42 ± 2.67	5.65 ± 0.72	< .001	HS

HS: highly significant

Figure : 1

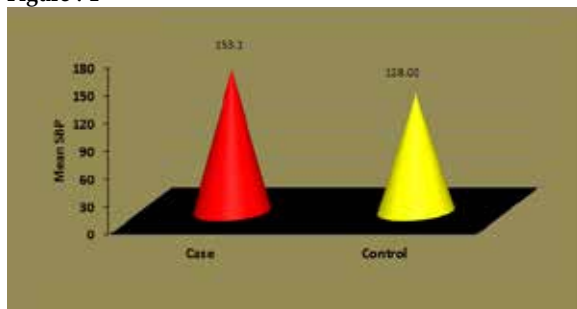


Table No.-2

Correlation between systolic blood pressure (SBP), diastolic blood pressure (DBP) & uric acid (UA) of Case group Subjects

Correlation	r-value	p-value	Significance
SBP v/s UA	+ 0.306	< .05	Sig
DBP v/s UA	+ 0.315	< .05	Sig

Sig : significant

Figure: 2

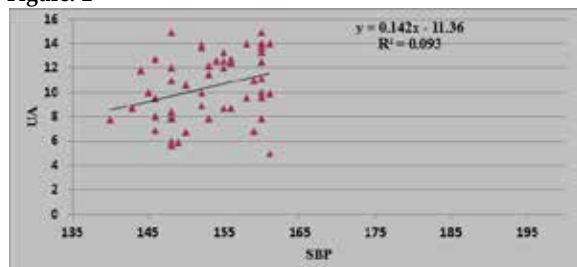
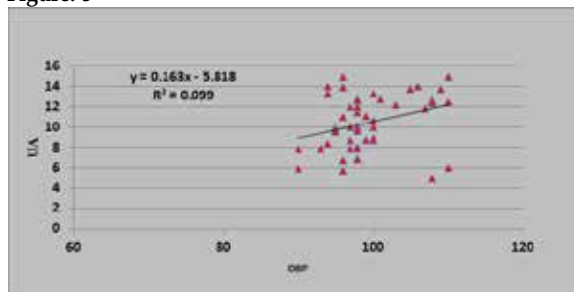


Figure: 3



Discussion:

Hypertensive disorders of pregnancy which frequently manifest as Preeclampsia continues to exert an enormous toll in developing countries like India and also in western society. Despite progress in its prevention, detection and treatment, it continues to be the leading cause of maternal death. Research over last decade proved the role of oxidative stress, endothelial cell injury and inflammation in pathophysiology of preeclampsia.

In the present study there was statistically highly significant increase in the levels of serum uric acid in cases (P < 0.001). There was significant positive correlation of serum uric acid with systolic and diastolic blood pressure. This is in accordance with the study done by Saleh F et al 2010, who also found significant increase in the serum uric acid levels in patients with preeclampsia and stated that it was a good predictor of maternal disease progression and fetal outcome. In the similar manner our study was also correlated with the study of Gulati R et al 2005 in his study found that hyperuricemia correlated strongly in preeclampsia.12

Conclusion :

uric acid itself is a good marker for hypertensive preeclamptic women.

References :

1. Carl. A. Hubel PhD, Margaret K. et al. *Am. J. Obst. Gynco* 1996; 174: 975-82.
2. Duckitt K, Harrington D. Risk factors for pre-eclampsia at antenatal booking: systematic review of controlled studies. *British Medical Journal* 2005; 330(7491): 565-567.
3. Barton JR, Sibai BM. Prediction and prevention of recurrent preeclampsia. *Obstetrics and Gynecology* 2008; 112(2): 359-372.
4. Duley L. Maternal mortality associated with hypertensive disorders of pregnancy in Africa, Asia, Latin America and the Caribbean. *Br J Obstet Gynaecol* 1992; 99: 547-553.
5. Cunningham FG, Leveno KG, Bloom SL, Hauth JC, Gilstrap III LC, Wenstrom KD. Hypertensive disorders in pregnancy. *Williams Obstetrics*. 22nd edition. Mc Graw Hill 2005;761-785.
6. Roberts JM, Bodnar LM, Lain KY. Uric Acid Is as Important as Proteinuria in Identifying Fetal Risk in Women With Gestational Hypertension. *Hypertension* 2005; 46:1263 -9.
7. Lorentzen B, Drevon CA, Enderson MJ, Henriksen T(Ed); **fatty acid pattern of esterified free fatty acids in sera of women with normal and preeclamptic pregnancy.** *Br J Obstetrics and gynecology*,1995,vol.102: 530-7.
8. Nadkar MY, Jain VI. Serum Uric Acid in Acute Myocardial Infarction. *JAPI* 2008;56(10):759-762.
9. Hawkins TL A, Roberts JM, Mangos GJ et al. Plasma Uric Acid remains a marker of poor outcome in hypertensive pregnancy: A Retrospective cohort study. *BJOG* 2012; 119:484 – 492.
10. Thefeld et al; *Clinical Biochemistry*: 1973
11. Saleh F, Shukar-ud-Din S, Soomro N. Serum uric acid as predictor model for pre eclampsia. *Pak J Surg* 2010; 26(3):246-251.
12. Gulati R. Raised serum TNF-alpha, blood sugar and uric acid in preeclampsia in third trimester of pregnancy. *JNMA J Nepal Med Assoc* 2005;44 (158):36-8.