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RISK FACTORS FOR PRETERM DELIEVERIES (PTB) & FOETAL DISTRESS

Biochemistry

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ABSTRACT

BACKGROUND – Preterm birth (<37 completed weeks gestation) and very low birth weight (VLBW; <1500g) are associated with elevated maternal serum uric acid level. Uric acid is a marker of oxidative stress,tissue injury & endothelial dysfunction. It increases risk of preterm delieveries & can cause poor fetal outcome like foetal distress,IUGR babies etc

MATERIALS & METHODS - 100 women admitted in OBGY ward in last trimester of pregnancy were selected and follow up study was taken till delivery. Serum Uric acid level was estimated in Biochemistry clinical Laboratory on Autoanalyser in all subjects at term & values was estimated and compared with Mode of their delivery. Level of Serum uric acid was compared with IUGR & fetal distress & their association was correlated.

RESULT – Our study shows positive correlation between increase level of serum uric acid & Preterm deliveries which shows association of hyperuricemia with Preterm labour. Current study also shows that there is positive and statistically significant relationship between hyperuricaemia in Pregnant women with fetal complications like IUGR, foetal distress, premature deliveries etc .

CONCLUSION – Increase serum uric acid level increases risk of preterm labours & fetal complications. So early screening for Serum uric acid level must be advised in pregnancy to prevent further risk like foetal distress & IUGR babies.

KEYWORDS

Preterm Delieveries, foetal Distress, Serum Uric Acid

INTRODUCTION:

Preterm birth (PTB) refers to a delivery that occurs between 20 and 37 weeks of gestation (a delivery before 20 weeks. PTB is relatively common, occurring in 5 to 18 percent of births worldwide. identification of modifiable and nonmodifiable risk factors for PTB before conception or early in pregnancy will lead to interventions that help prevent this complication.

Uric acid is negatively correlated with both birth weight [1,2,3,4] and gestational age [5]

Uric acid is the end product of purine metabolism.Normal Serum Uric Acid level – 3-6 mg%

Hyperuricemia is increased in blood levels of uric acid that is greater than 7 mg% in men and more than 6 mg% in women. Uric acid is filtered through the glomeruli and reabsorbed in the proximal tubules.In last trimester of pregnancy, there is impaired glomerular filtrate rate (GFR) so hyperuricemia is due to decline in renal uric acid clearance.

Hyperuricaemia increases risk of adverse fetal outcome including preterm birth and small for gestational age (SGA) compared to women without hyperuricaemia in pregnancy [6]. In the present study we tried to find out whether raised serum uric acid has an adverse effect on preterm delieveries, Preterm Birth(PTB) .[7] We also tried to find out if serum uric acid concentration can be used as a screening test for the prediction of fetal outcome.[8]

OBJECTIVES OF THE STUDY

I) To correlate association of elevated serum uric acid level (hyperuricemia) with preterm delieveries.
ii) To study relation of foetal distress & IUGR with increased maternal serum uric acid level.

METHOD OF COLLECTION OF DATA &SELECTION OF SUBJECTS:

100 pregnant women in last trimester of pregnancy were selected for study admitted in OBGY wards of Indira Gandhi Government Medical College & Hospital ,Nagpur(tertiary care centre) Their follow up study till term was taken to know mode of delievery & compared with serum uric acid level.

All details of study was explained to the subject and informed consent was taken & clinical examination & history was taken as per the proforma. Study is approved by Institutional Ethics Committee,IGGMC,Nagpur

SELECTION OF THE SUBJECT:

a)Inclusion Criteria

All Pregnant women (100) of age grp 20 to 40 yrs admitted in OBGY wards in last trimester of pregnancy in OBGY wards of IGGMC, Nagpur was taken as cases and their follow up was taken till their delivery to know outcome of foetus.

b) Exclusion Criteria –

1) Pregnant women with gestational diabetes mellitus
2) Pregnant women with pre-existing hypertension,renal failure, heartdisease,
3) Pregnant women of less than 20 years and more than 40 years of age
4) Past history of hyper uricemia, Renal dysfunction,Liver Dysfunction, Chronic Hypertension.,Gout.,History of Drug and alcohol abuse.

COLLECTION OF SAMPLE:

Informed consent of each patient was taken.

- About 2/3 ml venous blood sample required from each patient , from antecubital vein for the estimation of serum uric acid was collected in plain bulb.

- It was taken easily by disposable syringe and needle with all aseptic precautions

METHODS

For Serum Uric acid Estimation - Kit based on Uricase method Analysis was carried on Autoanalyser EM – 460 in clinical Biochemistry lab,IGGMC. Uric acid level & pregnancy outcome (preterm delieveries & fetal distress) was correlated.

RESULTS

Table 1-Association of Serum Uric acid level & Preterm delieveries

Serum Uric acid level (mg%)	Total No (100)	Preterm Delievery	Normal Delievery	P Value	Significance	% of Preterm
> 6mg %	63	27	36	0.00006	Significant < 0.05	42.86%
< 6mg %	37	2	35			5.41%
	100	29	71			

Table 2 - Association of Serum Uric acid level & IUGR

Serum Uric acid level (mg%)	Total No (100)	IUGR Wt of Baby (<1.5 kg)	Wt of Baby (>1.5 Kg)	P Value	Significance	% of Preterm
> 6mg %	63	29	34	0.00008	Significant < 0.05	46.03 %
< 6mg %	37	3	34			8.11 %
	100	29	68			

Table 3 - Association of Serum Uric acid level & Foetal Distress

Serum Uric acid level (mg%)	Total No (100)	FoetalDistress	No Foetal Distress	P Value	Significance	% of Preterm
> 6mg %	63	29	34	0.0000	Significant < 0.05	46.86%
< 6mg %	37	0	37			0 %
	100	29	71			

DISCUSSION

Results of Table 1 shows hyperuricemia in pregnant women ie Uric acid level >6mg% is seen in 63 patients of which 27 have preterm deliveries. So 42.86% preeclampsia patients with hyperuricemia shows preterm deliveries which is statistically significant (P value 0.0006)

Results of Table 2 shows increased uric acid level (hyperuricemia) in 63 pregnant women of which about 29 mothers give birth to low birth wt babies (IUGR ,wt < 1.5 kg) So about 46.03% with hyperuricemia pts have IUGR babies which is statistically significant (P value 0.00008)

Results of Table 3 shows increased uric acid level (hyperuricemia) in 63 pregnant women of which 29 babies suffer from fetal distress while 34 were normal So about 46.03% hyperuricemiapts have babies suffering from fetal distress which is statistically significant (P value < 0.05)

Similar to our findings, Park et al described an inverse relationship between uric acid and gestational age in a cohort of 3 year olds who were mostly born at term (mean gestational age for this cohort of 136 participants was 37.7 weeks with 16 born at ≤ 34 weeks gestation) [5] Inverse associations between birth weight and uric acid have been described in children born at term, suggesting a link between intrauterine growth restriction and elevated uric acid [1,3,4]

Krishna S et al, Thanna et al, Yalamati P et al,[9,10,11] concluded that high serum uric acid level could be a useful indicator of the maternal and fetal complication which is comparable to our study. Hawkins TL et al, studied in pregnant wome, risk of adverse maternal outcome and adverse fetal outcome increased with increasing concentration of uric acid which is compared [12] .Maximum number of adverse outcomes belonged to serum uric acid level >6 mg/dl compared to < 6 mg/dl. Similar observation was made by Yassaee[13].

Results of this study shows adverse effect of increased serum uric acid level on fetal outcome like fetal distress, IUGR babies which is due to Preterm delieveries. Therefore, estimation of serum uric acid does help to identify fetus at risk of developing adverse perinatal consequences and to assess severity of the disease. Laboratory investigations of serum uric acid is simple test and can be easily performed in any laboratory.

CONCLUSION

Increased maternal serum uric acid level can be used as a predictor of Preterm delieveries & fetal distress [14]. Results of our study shows correlation between elevated maternal serum uric acid and IUGR, foetal distress.

Uric acid is one of the most sensitive indicators of preterm delieveries and can be of great help in preventing complicated pregnancy specially improving perinatal outcome. [15] So estimation of Serum uric acid level in maternal blood can be a predictor of Preterm labour and foetal complication like IUGR babies and Foetal distress & early measurement can prevent future risk.

REFERENCES

1. Franco MCP, Christofalo DMJ, Sawaya AL, Ajzen SA, Sesso R. Effects of Low Birth Weight in 8-to 13-Year-Old Children - Implications in Endothelial Function and Uric Acid Levels. Hypertension. 2006;48:45–50. [PubMed] [Google Scholar]
2. Kaneshi T, Yoshida T, Ohshiro T, Nagasaki H, Asato Y, Ohta T. Birthweight and Risk Factors for Cardiovascular Diseases in Japanese Schoolchildren. Pediatr Int. 2007;49:138–43. [PubMed] [Google Scholar]
3. Feig DI, Nakagawa T, Karumanchi SA, Oliver WJ, Kang DH, Finch J, et al. Hypothesis: Uric Acid, Nephron Number, and the Pathogenesis of Essential Hypertension. Kidney Int. 2004;66:281–87. [PubMed] [Google Scholar]
4. Lurbe E, Garcia-Vicent C, Torro MI, Aguilar F, Redon J. Associations of Birth Weight and Postnatal Weight Gain With Cardiometabolic Risk Parameters at 5 Years of Age. Hypertension. 2014;63:1326–32. [PubMed] [Google Scholar]
5. Park B, Park E, Cho S, Kim Y, Lee H, Min J, et al. The Association Between Fetal and Postnatal Growth Status and Serum Levels of Uric Acid in Children at 3 Years of Age. Am J Hypertens. 2009;22:403–08. [PubMed] [Google Scholar]
.6. Parrish M, Griffin M, Morris R, et al. Hyperuricemia facilitates the prediction of maternal and perinatal adverse outcome in patients with severe/superimposed preeclampsia
7. Redman C, Beilin L, Bonnar J, Wilkinson R. Plasma urate measurements in predicting fetal death in hypertensive pregnancy. Lancet 1976; 1:13703.
8. Varma TR. Serum uric acid levels as an index of foetal prognosis in pregnancies complicated by pre existing hypertension and preeclampsia of pregnancy. Int J Gynaecol Obstet 1982; 20:401 8
9. Krishna TS, Krishnamma M, Rajeswari DR, Rao V, Naidu JN, et al. Alterations of serum uric acid concetrations in preeclampsia. Int J Applied Bio Pharmaceutical Tech. 2015;6(2):165-7.
10. Lancet M, Fisher IL. The value of blood uric acid levels in toxaemia of pregnancy. J ObstetGynaecol Br Emp. 1956;63:116-9.
11. Thanna RC, Choudhary R, Pathak S, Vamne A, Nigoskaret S. Level of serum acid in preeclampsia. International J Clinical Biochem. 2015;2(2):120-2.
12. Hawkins TL, Roberts LM, Brown MA. Plasma uric acid remains a marker of poor outcome in hypertensive pregnancy: a retrospective cohort study. BJOG. 2012;119(4):484-92. .
13. Yassaee F. Hyperuricemia and perinatal outcomes in patients with severe preeclampsia. Int J Med Sci 2003; 28.
14. Martin JN, May WL, Magann EF, Terrone DA, Rinehart BK, Blake PG. Early risk assessment of severe preeclampsia: admission battery of symptoms and laboratory tests to predict likelihood of subsequent significant maternal morbidity. Am J Obstet Gynecol. 1999;180:1407-14.
15. Oken E, Kleinman KP, Rich-Edwards J, Gillman MW. A Nearly Continuous Measure of Birth Weight for Gestational Age Using a United States National Reference. BMC Pediatr. 2003;3:6. [PMC free article] [PubMed] [Google Scholar]
16. Lipkowitz M. Regulation of Uric Acid Excretion by the Kidney. Curr Rheumatol Rep. 2012;14:179–88. [PubMed] [Google Scholar]
17. Watanabe S, Kang DH, Feng L, Nakagawa T, Kanellis J, Lan H, et al. Uric Acid, Hominoid Evolution, and the Pathogenesis of Salt-Sensitivity. Hypertension. 2002;40:355–60. [PubMed] [Google Scholar]
18. Feig DI, Soletsky B, Johnson RJ. Effect of Allopurinol on Blood Pressure of Adolescents With Newly Diagnosed Essential Hypertension - A Randomized Trial. Jama-Journal of the American Medical Association. 2008;300:924–32. [PMC free article] [PubMed] [Google Scholar]
19. Lind T, Godfrey KA, Otun H, Philips PR. Changes in serum uric acid concentrations during normal pregnancy. Br J Obstet Gynaecol 1984; 91:128 32.