

SERUM URIC ACID LEVELS IN PREGNANCY INDUCED HYPERTENSION - A CROSS SECTIONAL STUDY

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ABSTRACT

INTRODUCTION

We evaluated the serum uric acid levels across trimesters to understand the trend in pregnancy induced hypertension.

MATERIAL AND METHODS

30 women with pregnancy induced hypertension in 2nd and 3rd trimester each; between 20- 30 years were enrolled. Clinical data and details of laboratory investigations as available from each individual was recorded in a pretested structured proforma. One time UA levels were compared.

RESULTS

Fifteen participants with pregnancy induced hypertension without proteinuria from 2 & 3trimesters were evaluated. They were age matched. Uric acid levels were statistically higher in 3rd trimester (7.14±2.72 mg/dL) than second (5.18±1.21 mg/dL), which was substantiated by higher blood pressures in PIH patients in third trimester (p<0.05).

CONCLUSION

Uric acid level is significantly higher in third trimester pregnancy induced hypertensive patients than second trimester. Uric acid trend across trimesters needs to be evaluated.

KEYWORDS

Pregnancy induced hypertension, Uric acid, trimester.

HOW TO CITE THIS ARTICLE: Batchu NJ, Tumat SJ. Serum uric acid levels in pregnancy induced hypertension - a cross sectional study. J. Evid. Based Med. Healthc. 2016; 3(14), 501-502. DOI: 10.18410/jebmh/2016/114

INTRODUCTION: Gestational hypertension (GH) is new onset hypertension after the 20th week of gestation, without proteinuria, on the other hand, a variant with proteinuria and impaired renal function is preeclampsia.⁽¹⁾ Studies have showed that women who had an GH have higher uric acid (UA) concentrations.⁽²⁾ At 20 weeks of pregnancy uric acid levels are increased 1.5-times in preeclampsia women.⁽³⁾ First trimester elevated uric acid is more strongly associated with pre-eclampsia and gestational hypertension with hyperuricemia.⁽⁴⁾ Elevated uric acid in hypertensive disorders in pregnancy is associated with both maternal and foetal outcomes.⁽⁵⁾⁽⁶⁾⁽⁷⁾ As we have inspired by the above background information, we too evaluated the serum uric acid levels across trimesters to understand the trend in pregnancy induced hypertension.

METHODS: This cross-sectional study enrolled 30 women with pregnancy induced hypertension in 2nd and 3rd trimester each, between 20-30 years were enrolled between October 2012 and June 2013. Patients with liver disease, rheumatic heart disease, known hematologic disease, and a

history of kidney stone, and renal dysfunction (creatinine >2mg/dL) were excluded. Clinical data and details of laboratory investigations as available from each individual was recorded in a pretested structured proforma. One time UA levels were compared.

STATISTICAL ANALYSIS: The data are presented as mean±standard deviation for normally distributed variables. Unpaired t test was used to detect clinical differences between the trimesters. A P value<0.05 was considered significant. Statistical analysis was performed using SPSS 16 (SPSS, Inc, Chicago, IL).

RESULTS: Fifteen participants with pregnancy induced hypertension without proteinuria from 2 & 3trimesters were evaluated. They were age matched. Uric acid levels were statistically higher in 3rd trimester (7.14±2.72 mg/dL) than second (5.18±1.21 mg/dL), which was substantiated by higher blood pressures in PIH patients in third trimester (p<0.05). All patients were receiving antihypertensive medications.

Submission 27-01-2016, Peer Review 10-02-2016,

Acceptance 17-02-2016, Published 18-02-2016.

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DOI: 10.18410/jebmh/2016/114

Pregnancy induced hypertension	Second Trimester (n= 15)	Third Trimester (n= 15)	P-value
Age in years	24.91±6.14	23.27±8.36	P>0.05
SBP (mmHg)	154.4±12.0	160.4±16.0	P<0.05
DBP (mmHg)	94.4±11.0	104.4±13.0	P<0.05
Cr mg/dL	1.07±0.25	1.16±0.23	P>0.05
UA mg/dL	5.18±1.21	7.14±2.72	P<0.05

Table 1: Pregnancy induced hypertension

DISCUSSION: Xanthine oxidase (XO) is an iron, molybdenum containing flavoprotein which catalyses the oxidation of xanthine/hypoxanthine into uric acid. XO levels are very less in healthy individuals but have shown to be increased in the pathological conditions.⁽⁸⁾ High level of uric acid in preeclampsia is by damage and death of trophoblastic cells and proliferation. During the initial stages of preeclampsia, changes in uric acid concentrations may be due to metabolic alterations.⁽³⁾ As the pregnancy progresses, uricemia in preeclampsia is likely from reduced uric acid clearance.⁽⁹⁾ Studies have shown increased uric acid production in condition of ischemia reperfusion.⁽¹⁰⁾ Improper spiral arteries implantation, causes a relatively hypoxic maternal-foetal interface, and increased turnover of trophoblast tissue, might result in increased uric acid levels.⁽¹¹⁾ Uric acid level showed a significant increase in pre-eclampsia when compared to the control before delivery however values were non-significant after delivery.⁽¹²⁾

CONCLUSION: Uric acid level is significantly higher in third trimester pregnancy induced hypertensive patients than second trimester. Uric acid trend across trimesters needs to be evaluated.

REFERENCES

1. Brown MA, Lindheimer MD, de Swiet M, et al. The classification and diagnosis of the hypertensive disorders of pregnancy: statement from the international society for the study of hypertension in pregnancy (ISSHP). Hypertension in pregnancy 2001;20(1):IX-XIV. PubMed PMID: 12044323. Epub 2002/06/05. eng.
2. Weissgerber TL, Milic NM, Turner ST, et al. Uric acid: A missing link between hypertensive pregnancy disorders and future cardiovascular disease? Mayo Clinic proceedings 2015;90(9):1207-16. PubMed PMID: 26260220. Pubmed Central PMCID: PMC4567408. Epub 2015/08/12. eng.
3. Corominas AI, Balconi SM, Palermo M, et al. Serum uric acid levels and risk of developing preeclampsia. Medicina 2014;74(6):462-71. PubMed PMID: 25555007. Epub 2015/01/03. Niveles de acido urico serico y riesgo de desarrollar preeclampsia. spa.
4. Laughon SK, Catov J, Powers RW, et al. First trimester uric acid and adverse pregnancy outcomes. American journal of hypertension 2011;24(4):489-95. PubMed PMID: 21252861. Pubmed Central PMCID: PMC3062659. Epub 2011/01/22. eng.
5. Roberts JM, Bodnar LM, Lain KY, et al. Uric acid is as important as proteinuria in identifying fetal risk in women with gestational hypertension. Hypertension 2005;46(6):1263-9. PubMed PMID: 16246973. Epub 2005/10/26. eng.
6. Livingston JR, Payne B, Brown M, et al. Uric acid as a predictor of adverse maternal and perinatal outcomes in women hospitalized with preeclampsia. Journal of obstetrics and gynaecology Canada: JOGC = Journal d'obstetrique et gynecologie du Canada : JOGC. 2014;36(10):870-7. PubMed PMID: 25375299. Epub 2014/11/07. eng.
7. Yalamati P, Bhongir AV, Betha K, et al. Relationship of serum uric acid, serum creatinine and serum cystatin C with maternal and fetal outcomes in rural Indian pregnant women. International journal of reproduction, contraception, obstetrics and gynecology 2015;4(5):1505-10. PubMed PMID: 26583159. Pubmed Central PMCID: PMC4646224. Epub 2015/11/20. Eng.
8. Newaz MA, Adeeb NN. Detection of xanthine oxidase in human plasma. The Medical journal of Malaysia 1998;53(1):70-5. PubMed PMID: 10968141. Epub 2000/09/01. eng.
9. Pramanik T, Khatiwada B, Pradhan P. Serum uric acid level in normal pregnant and preeclamptic ladies: a comparative study. Nepal Medical College journal: NMCJ 2014;16(1):30-2. PubMed PMID: 25799807. Epub 2015/03/25. eng.
10. Hawkins TL, Roberts JM, Mangos GJ, et al. Plasma uric acid remains a marker of poor outcome in hypertensive pregnancy: a retrospective cohort study. BJOG : an international journal of obstetrics and gynaecology 2012;119(4):484-92. PubMed PMID: 22251368. Epub 2012/01/19. eng.
11. Many A, Hubel CA, Roberts JM. Hyperuricemia and xanthine oxidase in preeclampsia, revisited. American journal of obstetrics and gynecology 1996;174(1 Pt 1):288-91. PubMed PMID: 8572024. Epub 1996/01/01. eng.
12. Bambrana V, Dayanand CD, Kotur PP. Is xanthine oxidase, a marker in pre-eclampsia? A case-control study. Journal of clinical and diagnostic research: JCDR 2015;9(10):BC01-3. PubMed PMID: 26557508. Pubmed Central PMCID: PMC4625227. Epub 2015/11/12. eng.