



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**

<http://doi.org/10.5281/zenodo.1319071>

Available online at: <http://www.iajps.com>**Research Article**

PERINATAL OUTCOME IN PRE ECLAMPTIC FEMALES WITH AND WITHOUT HYPERURICEMIA

¹ Dr. Nida Pervaiz, ² Dr. Amir Hussain, ³ Dr. Aamna Shahbaz

¹Punjab Medical College Faisalabad, Pakistan

²Punjab Medical College Faisalabad, Pakistan

³Foundation University Medical College Rawalpindi, Pakistan

Abstract:

Aim: To compare perinatal outcome in pre eclamptic females with and without hyperuricemia

Methods: 120 cases (60 in two groups) between 28-32 weeks of gestation, 20-40 years of age, diagnosed women with pre-eclampsia with singleton pregnancy were enrolled. We excluded all those cases with chronic renal disease, essential hypertension, diabetes mellitus, gout and those already under treatment of hyperuricemia. This study was conducted at Department of Obstet & Gynaecology, Civil Hospital Karachi in the duration of 6 months from July 2017 to December 2017. Two groups were formed, in study group all those cases with increased level of serum uric acid (> 5.5mg / dl at term) and control group (no increase in serum uric acid level), all these cases were admitted in hospital and followed till delivery following all ethical issues. Close monitoring was done during their stay at hospital and managed according in case of any complication developed during this period. All these cases were followed till delivery of the fetus. The presence of neonatal complications i.e. IUD's or IUGR were diagnosed on ultra-sonographic examination. **Results:** Out of 120 cases (60 in each group), mean age in study group was 28.67+4.16 years and 29.96+3.68 years in control group. Comparison of perinatal outcome shows that 73.33%(n=44) in study group and 38.33%(n=23) in control group had IUGR, p value was 0.0001 whereas IUD was recorded in 31.67%(n=19) in study group and 6.67%(n=4) in control group, p value was 0.0005.

Conclusion: Adverse perinatal outcome i.e. IUGR and IUD is significantly higher in pre-eclamptic females with hyperuricemia as compared to those without elevated levels of serum uric acid

Keywords: Pre-eclampsia, elevated levels of serum uric acid, adverse perinatal outcome

Corresponding Author:

Dr.Nida Pervaiz,

*Punjab Medical College,
Faisalabad, Pakistan*

QR code



Please cite this article in press Nida Pervaiz et al., *Perinatal Outcome in Pre Eclamptic Females With and Without Hyperuricemia*, Indo Am. J. P. Sci, 2018; 05(07).

INTRODUCTION:

Pre-eclampsia is recorded as a potential risk factor of maternal perinatal adverse outcome despite of high quality care.¹ It affects various organ systems and may cause severe neurological, renal, hepatic and cardiopulmonary complications. Usually, fetus is affected with this morbidity including intrauterine growth restriction, preterm birth and mortality. Eventually, delivery of fetus is the only ultimate treatment for pre-eclampsia, however, in various cases, increasing maternal & fetal monitoring may help in expectant management. Identification of high risk women with this disease is a big challenge for timely and appropriate management.²

Elevate levels of serum uric acid are commonly found in pre-eclamptic women and it is widely accepted that it is a results of decrease in glomerular filtration rate (GFR), while the others are of the view that hyperuricemia may have a possible role in the pathogenesis of preeclampsia, due to endothelial dysfunction.³⁻⁵

Mixed results are recorded in various studied showing associated between hyperuricemia and adverse fetomaternal outcome. Few of the authors proposed that hyperuricemia may be used as a useful predictor for adverse fetomaternal outcome.⁶⁻⁸ On the other hand, it is also suggested that it is not a useful predictor.⁹⁻¹⁰ We considered it inevitable to clarify this ambiguity for the improvement of perinatal outcome in hyperuricemic preeclamptic women monitoring serum uric acid levels so that a close surveillance and appropriate management may prevent perinatal complications with the decrease in perinatal morbidity and mortality.

PATIENTS AND METHODS:

In this study, 120 cases (60 in two groups) between 28-32 weeks of gestation, 20-40 years of age, diagnosed women with pre-eclampsia with singleton pregnancy were enrolled. We excluded all those cases with chronic renal disease, essential hypertension, diabetes mellitus, gout and those already under treatment of hyperuricemia.

This study was conducted at Department of Obstet & Gynaecology, Civil Hospital Karachi in the duration of 6 months from July 2017 to December 2017. Patients' informed consent was obtained. Two groups were formed, in study group all those cases with increased level of serum uric acid ($> 5.5\text{mg / dl}$ at term) and control group (no increase in serum uric acid level), all these cases were admitted in hospital and followed till delivery following all ethical issues. Close monitoring

was done during their stay at hospital and managed according in case of any complication developed during this period. All these cases were followed till delivery of the fetus. The presence of neonatal complications i.e. IUD's or IUGR were diagnosed on ultrasonographic examination. Required statistical stools to analyze the data were applied.

RESULTS:

Age distribution of the patients shows that out of 60 cases in study group 55%(n=33) and out of 60 cases in control group 58.33%(n=35) were between 20-30 years of age whereas 45%(n=27) in study group and 41.67%(n=25) in control group were between 31-40 years of age, mean \pm sd was calculated as 28.67 \pm 4.16 years in study and 29.96 \pm 3.68 years in control group. (Table No. 1)

Comparison of perinatal outcome shows that 73.33%(n=44) in study group and 38.33%(n=23) in control group had IUGR, p value was 0.0001 whereas IUD was recorded in 31.67%(n=19) in study group and 6.67%(n=4) in control group, p value was 0.0005. (Table No. 2)

Table No. 1
Distribution of patients by age (n=120)

Age (Year)	Study group (n=60)		Control group (n=60)	
	No.	%	No.	%
20-30	33	55	35	58.33
31-40	27	45	25	41.67
Total	60	100	60	100
Mean\pmSD	28.67\pm4.16		29.96\pm3.68	

Table-2
COMPARISON OF PERINATAL OUTCOME

Outcome	Study group (n=60)		Control group (n=60)		P value
	No.	%	No.	%	
IUGR	44	73.33	23	38.33	0.0001
IUD	19	31.67	4	6.67	0.0005

DISCUSSION:

In recent past, hyperuricemia in pregnancy was given higher attention and it has been discussed in various studies for its utility to diagnose adverse perinatal outcome in pre-eclamptic women.

Kang DH revealed that higher levels of serum uric acid in pregnant females is a valuable biomarker for diagnosing preeclampsia rather it has a causative role in the pathogenesis adverse perinatal outcome.¹¹ Serum uric acid is a strong inhibitor of endothelial function and passes freely into the fetal circulation.¹¹ It is responsible to block vascular endothelial growth

factor-induced endothelial proliferation and, plays a direct role to block fetal angiogenesis, which results in small-for-gestational-age infants.

Joel R. Livingston and others² revealed that concentration of serum uric acid is found with a significant relation with adverse perinatal outcomes, however, the point of estimation was < 0.7. they concluded that in admitted pregnant females with pre-eclampsia, serum uric acid levels may be helpful for prediction of adverse perinatal outcome but it is not useful to predict maternal outcome.

Another study¹² by Nura Audu at Nigeria, recorded higher serum uric acid levels in pre-eclamptic and eclamptic pregnant females and these cases mean birth weight was significantly lower in eclamptic cases as compared to those with normal birth weight. They concluded that maternal hyperuricemia is a reliable predictor for maternal outcome in pre-eclamptic and eclamptic cases.

Several other studies¹³⁻¹⁶ supported our results that higher maternal serum uric acid levels are responsible for higher risk of adverse perinatal outcomes. Our findings indicate that in pregnant females with hypertension, evaluation of uric acid is a useful indicator to observe fetal complications of preeclampsia as compared to the measurement of blood pressure alone. Though, preeclamptic cases are usually evident clinically but the increase in serum uric acid confirm these diagnoses.¹⁷⁻¹⁹

Hussain and others²⁰ recorded a significant higher rate of low birth weight in hyperuricemic pre-eclamptic/eclamptic females as compared to those with normouricemic females, other studies also recorded similar trend in pre-eclamptic females with hyperuricemia²¹⁻²³ this trend indicates that raised uric acid is responsible for growth retardation.^{21,24-26}

CONCLUSION:

- Adverse perinatal outcome i.e. IUGR and IUD is significantly higher in pre-eclamptic females with hyperuricemia as compared to those without elevated levels of serum uric acid

REFERENCES:

1. Steegers EAP, von Dadelszen P, Duvekot JJ, Pijnenborg R. Pre-eclampsia. Lancet 2010;376:631-44.
2. Livingston JR, Payne B, Brown M, Roberts JM. Uric Acid as a Predictor of Adverse Maternal and Perinatal Outcomes in Women Hospitalized With Preeclampsia. JOGC 2014;870-7.
3. Payne BA, Hutcheon JA, Ansermino JM, Hall DR, Bhutta ZA, Bhutta SZ, et al. A risk prediction model for the assessment and triage of women with hypertensive disorders of pregnancy in low-resourced settings: the miniPIERS (Pre-eclampsia Integrated Estimate of RiSk) Multi-country Prospective Cohort Study. PLoS Med 2014;11(1):e1001589.
4. Kang DH, Finch J, Nakagawa T, Karumanchi SA, Kanellsi J, Granger J, et al. Uric acid, endothelial dysfunction and pre-eclampsia: searching for a pathogenetic link. J Hypertens 2004; 22:229-35.
5. Bainbridge SA, Roberts JM. Uric acid as a pathogenic factor in preeclampsia. Placenta 2008;29(Suppl A):S67-72.
6. Koopmans CM, van Pampus MG, Groen H, Aarnoudse JG, van den Berg PP, Mol BW. Accuracy of serum uric acid as a predictive test for maternal complications in preeclampsia: bivariate meta-analysis and decision analysis. Eur J Obstet Gynecol Reprod Biol 2009;146:8-14.
7. Bellomo G, Venanzi S, Saronio P, Verdura C, Narducci PL. Prognostic significance of serum uric acid in women with gestational hypertension. Hypertension 2011;58:704-8.
8. Roberts JM, Bodnar LM, Lain KY, Hubel CA, Markovic N, Ness RB, et al. Uric acid is as important as proteinuria in identifying fetal risk in women with gestational hypertension. Hypertension 2005;46(6):1263-9.
9. Thangaratinam S, Ismail KM, Sharp S, Coomarasamy A, Khan KS. Accuracy of serum uric acid in predicting complications of preeclampsia: a systematic review. BJOG 2006;113:369-78.
10. Williams KP, Galerneau F. The role of serum uric acid as a prognostic indicator of the severity of maternal and fetal complications in hypertensive pregnancies. J Obstet Gynaecol Can 2002;24:628-32.
11. Kang DH, Finch J, Nakagawa T, Karumanchi SA, Kanellsi J, Granger J, Johnson RJ. Uric acid, endothelial dysfunction and pre-eclampsia: searching for a pathogenetic link. J Hypertens. 2004;22:229-35.
12. Audu N, Gadzama AA. Effect of hyperuricemia on pre-eclamptic, eclamptic patients and their fetal outcome. European Journal of Biomedical and Pharmaceutical Sciences 2016;3:85-8.
13. Liedholm H, Montan S, Aberg A. Risk grouping of 113 patients with hypertensive disorders during pregnancy, with respect to serum urate, proteinuria and time of onset of hypertension. Acta Obstet Gynecol Scand Suppl 1984;62(Suppl 118):43-8.
14. Redman CW, Beilin LJ, Bonnar J, Wilkinson RH. Plasma-urate measurements in predicting fetal death in hypertensive pregnancy. Lancet 1976;1:1370-3.

15. Lancet M, Fisher IL. The value of blood uric acid levels in toxemia of pregnancy. *J Obstet Gynaecol Br Emp* 1956;63:116–9.
16. McFarlane CN. An evaluation of the serum uric acid level in pregnancy. *J Obstet Gynaecol Br Commonw* 1963;70:63–8.
17. Rahman, M, Gopalan, S, Dhaliwal, L, Sarker, AK, 'Hyperuricemia and pregnancy induced hypertension- reappraisal,' *Indian J Med Sci* 1996; 50(3):68-71.
18. Redman, CWG, Roberts, JM, 'Management of preeclampsia,' *Lancet*, 1993;341:1451-54.
19. Reynold, C, Mabie,WC, Sibai, BM, Decherny, AH, Nathan, L, 'Hypertensive states of pregnancy,' 9th edition, McGraw-Hill, New York, 2003;338-53.
20. Hussain SS, Choudhury MBK, Akhter J, Begum S, Mowsumi FR, Azad MKH. Fetal outcome of preeclamptic mothers with hyperuricemia. *J Dhaka National Med Coll. Hospital* 2011; 17(01): 41-3.
21. Redman CWG, Beilin LJ, Bodnar J, Wilkinson RH. Plasma-urate measurement in predicting fetal death in hypertensive pregnancy. *The lancet* 1976;1:13970-3.
22. Lam C, Lim KH, Kang DH, Karumanchi SA. Uric acid and preeclampsia; *semin nephrol* 2005; 25(1);56-60.
23. Gulshan Ara Saeed, Rehana Hamid, Nasim Begum Khattak. Serum uric acid level as a marker for predicting progression of gestational hypertension to pre-eclampsia and fetal morbidity. *Pakistan Armed forces Med J* 2003; 53(2):136-41.
24. D' Anna R, Baviera, Scilipoti A, Leonardi, Leo R. The clinical utility of serum uric acid measurement in pre-eclampsia and transient hypertension in pregnancy. *Panminerva Med* 2000;42:101-03.
25. Feig DI, Nakagawa T, Karumanchi SA, Oliver WJ, Kang D, Finch J, Johnson RJ. Hypothesis: Uric acid, nephron number and the pathogenesis of essential hypertension. *Kidney International* 2004;66:281-7.
26. Alicia M. Lapidus. Effect of pre-eclampsia on the mother fetus and child (2011). *Gynecology forum*.