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Original Research Article

A Comperative Study of Serum Creatinine, Serum Uric Acid and Blood Urea in Normal Pregnant and Pregnancy Induced Hypertensive Subject

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Abstract

Background: Pregnancy induced hypertension also known as Preeclampsia clinically is one of the commonly seen complication in pregnant women. It contributes to the cause of maternal and peri natal morbidity and mortality. According to some study, serum creatinine, Blood urea, serum uric acid level increases during pregnancy induced hypertension. Preeclampsia is associated with renal function impairment. The objective of this study is to compare serum creatinine, Blood Urea and Serum Uric acid in preeclampsia with normal pregnancy. ***Materials and methods***: The study was performed on 86 pregnant women. Out of which 50 women were pregnancy induced hypertensive and 36 were normal pregnant women. ***Result*** : The result showed significantly high blood pressure (SBP-160.0±18.8 VS 112.64±8.19, DBP 110.68±9.55 VS 76.8±4.14)and Blood urea (16.56 ±1.72 mg% VS 22.25±1.28 mg%), serum creatinine (0.72 ±0.19 mg% VS 1.09±0.34 mg%), serum uric acid level (4.63±0.19 mg% VS 7.04±0.4 mg%)in pregnancy induced hypertensive women compares to normal pregnant women. In the present study, in pre-eclampsia, there is elevation of serum uric acid and serum creatinine elevated values are statistically significant. ***Conclusion:*** There is a renal derangement of parameters in preeclampsia so it may be advised to renal function test to confirm involvement of renal dysfunctions. Measurement of renal function Test could be used as a biochemical indicator in pregnancy induced hypertensive women.

Keywords: Pregnancy induced hypertension, Serum Creatinine, Blood Urea, Serum uric acid, renal function tests.

INTRODUCTION

Hypertension is the one of the common complication met with in pregnancy. It contributes significantly to the cause of maternal and perinatal morbidity and mortality. Gestational hypertension is a common first clinical presentation of preeclampsia. It is well known that serial changes occur in serum uric acid level in normal pregnancy [1] and pregnancy induced hypertension [2]. Pregnancy induced hypertension is an exclusive condition affecting 10% of pregnant women [3].The raised level of uric acid in the pregnancy induced hypertension is considered to be due to its diminished destruction in liver, which was based upon the observation of Stander and Cadden [4], who did not find impairment of uric acid excretion. However, Sieitchik [5] showed that there was excessive reabsorption of urate by renal tubules in toxaemic condition. They reported that the faulty renal function was the sole causative factor in urate accumulation in pregnancy induced hypertension. There is positive correlation seen between the raised serum uric acid level and adverse fetal outcome [6]. Therefore, in view of the greater emphasis placed on maternal and child health in present era, the present study was undertaken to compare serum uric acid level during normal pregnancy and pregnancy induced hypertension. Various theories to explain the pathogenesis have been put forward. The main etiopathogenesis is placental implantation with abnormal trophoblastic invasion of uterine vessels & endothelial cell activation and dysfunction [7].

MATERIAL AND MATHODS

The present study was carried out at Vadnagar medical college and hospital, Visnagar, from 2017 to 2019. The study was performed on 86 pregnant women, out of whom 36 women were of normal pregnancy and 45 were of pregnancy induced hypertension. Aged matched normal healthy non-pregnant women served as control (n=30). Patient selection, examination and

sample collection done at obstetrics and gynecology OPD. Patients with known hypertension, gout, hematological disorders, chronic nephritis, eclampsia, diabetes, multiple pregnancies and first trimester pregnancy were excluded in this study. Verbal consents of the patients were taken before the collection of blood by veni puncture. Renal Function Test was determined by quantitative estimation on colorimetric method by enzymatic uricase method. Statistical analysis of data was done by mean values, SD, T-test, P value for significance.

RESULT

Table-1: Distribution of subjects in the two groups

Groups	Number of subjects
Normal Pregnancy (Group A)	36
Preeclampsia (Group B)	50

Table-2: Age distribution of subjects in the two groups

Age (in years)	Normal Pregnancy (Group A)	Preeclampsia (Group B)
22 – 25	19	20
26 – 29	15	24
30 – 33	02	05
34 – 37	00	01
Total	36	50

Table-3: Showing the Gravida distribution of control and study groups

Gravida	Normal Pregnancy (Group A)	Pre-eclampsia (Group B)
Primigravida	20	36
Multigravida	16	14
Total	36	50

Table-4: Showing mean and standard deviation of Blood pressure and serum uric acid level in control and study Groups

Subject	SBP(mm Hg) Mean +/- SD	DBP (mm Hg) Mean +/- SD	S. Uric Acid (mg/dl) Mean +/- SD	S.creatinine level	Blood urea
Normal pregnant (n=36)	123.64 +/- 5.19	78.6 +/- 3.11	4.24+/- 0.6	1.09.±0.17 mg/dl	29.65 ± 6.04
PIH (n=50)	163.76 +/- 18.8	107.68 +/- 8.35	7.46 +/- 1.29	1.21±0.47 mg/dl	31.05 ± 5.22
P value	P<0.001	P<0.001	P<0.001	P<0.001	P<0.05

Table-5: S. Uric acid level compression with other study in pre-eclampsia patient.

Study	Serum uric acid	P value
Niraula *et al.*	5.46±1.51	P<0.001
Bhagvan Y *et al.*	7.34±1. 68	P<0.001
Sharma *et al.*	7.52±0.772	P<0.001
Present study	7.46 +/- 1.29	P<0.001

Table-6: S. creatinine level compression with other study in pre-eclampsia patient.

Study	Serum creatinine	P value
Bhagvan Y *et al.*	1.21±0.47 mg/dl	P <0.001
Israa A MJ *et al.*	1.045±0.14 mg/dl	P<0.05
Patil *et al.*	1.09±0.23mg/dl	P <0.05
Present study	1.21±0.47 mg/dl	P <0.001

DISCUSSION

Pregnancy induced hypertension is a major health problem in pregnant women despite of advancements in the field of medical sciences. In this study systolic blood pressure significantly increased in both normal and PIH subjects. While elevation of diastolic blood pressure is significant in pregnancy induced hypertensive subjects. So, there is a positive correlation between diastolic blood pressure and serum uric acid level. Mustaphi *et al*. [2], Redman [7], Verma [8] also reported similar findings. In present study elevation of serum uric acid level is significant

($p<0.001$) in pregnancy induced hypertensive subjects (7.46 +/- 1.29) as compared to normal pregnant subjects (4.24 +/- 0.6) and control subjects (3.99 +/- 0.58). Mustaphi [2] and Redman [7] also found elevation of serum uric acid in pregnancy induced hypertensive subjects. According to Redman [7] serum uric acid level concentration also predicts pre-eclampsia and perinatal outcome& is one of the most consistent and earliest detectable change in pre-eclampsia. He also stated that serum uric acid level were better indicator than blood pressure levels in predicting fatal prognosis. Chesely and Williams [9] stated that in pregnancy induced hypertension there was impaired tubular reabsorption of uric acid leads to impaired uric acid clearance. However, Pollak and Netttles [10] reported that decreased uric acid clearance was the result of enhanced tubular reabsorption or inhibited tubular secretion or both. Uric acid is a metabolite of the degradation of nucleotides which increases their blood levels in patients with pre-eclampsia and eclampsia. Its synthesis increasing by damage and death of trophoblastic cell and decreased urinary excretion due to lower glomerular filtration rate and increased absorption in the proximal tubule [11].

CONCLUSION

The measurement of renal function test has a great diagnostic value in pregnancy induced hypertensive and could be used as a biochemical indicator in PIH. So, the disease can be identified early and its deterioration prevented by proper management. Our study was conducted to estimate the renal function test in pre-eclampsia and normal pregnancy and find out association between renal function test and pre-eclampsia and normal pregnancy.

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