Original Research Article

Biochemical profile in pregnancy induced hypertension (PIH): A hospital based study

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Abstract

Background: The term pregnancy-induced hypertension (PIH) is used to describe any new pregnancy onset related hypertension. It includes the development of hypertension without proteinuria and is a potential precursor to pre-eclampsia or eclampsia in the latter circumstance. **Material and Methods:** The present study was carried out at MNR Medical college and hospital from August 2017 to December 2017. The study subjects selected from the obstetrics and gynecology ward of MNR hospital. The study subject comprises normotensive pregnant women and women with PIH. Total 50 subjects were selected, and further divided into two groups; group-1 normotensive pregnant women and group 2 pregnant women with PIH. **Results:** The two groups were similar in the parameters like age, gestational age at blood sampling, and gestational age at delivery. Proteinuria, serum uric acid, Creatinine, and triglycerides were increased in cases than controls and showed a statistically significant increase as compared to the control group. **Conclusion:** Thus the assessment of biochemical profile may be helpful in prevention of complications in PIH.

Key Words: Pregnancy Induced Hypertension (PIH), Biochemical profile, Creatinine, Uric acid.

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Received Date: 02/01/2018 Revised Date: 18/01/2018 Accepted Date: 01/02/2018
DOI: https://doi.org/10.26611/1002521

Access this article online	
Quick Response Code:	Website: www.medpulse.in
	Accessed Date: 04 February 2018

INTRODUCTION

Hypertensive disorders of pregnancy have variously classified. The term pregnancy-induced hypertension (PIH) is used to describe any new pregnancy onset related hypertension. It includes the development of hypertension without proteinuria and is a potential precursor to pre-eclampsia or eclampsia in the latter circumstance[1,2,3].Pre-eclampsia differs from gestational hypertension due to its multisystem involvement such as proteinuria. When women with pre-existing hypertension develop an exacerbation during pregnancy accompanied by proteinuria or other systemic signs, it termed as hypertension with superimposed pre-eclampsia. When a woman presents with hypertension in pregnancy, the first step is to establish whether it is of new onset or is pre-existing, essential hypertension carries with it an excellent prognosis in pregnancy unless superimposed pre-eclampsia develops[4]. To understand the biochemical profile of routine parameters in PIH, and to know how they tend to differ from a healthy pregnancy.

MATERIALS AND METHODS

The present study was carried out at MNR Medical college and hospital from August 2017 to December 2017. The study subjects selected from the obstetrics and gynecology ward of MNR hospital. The study subject comprises normotensive pregnant women and women with PIH. Total 50 subjects were selected, and further divided in to two groups; group-1 normotensive pregnant women and group 2 pregnant women with PIH.

Inclusion Criteria: Normotensive pregnant women were selected from the same hospital and investigated. The

How to cite this article:Vasundhara Devi Dundi, Nagababu Pyadala.Biochemical profile in pregnancy induced hypertension (PIH): A hospital based study.*MedPulse International Journal of Biochemistry*. February 2018; 5(2): 48-50.
https://www.medpulse.in/Biochemistry/

subjects chose after screening the pregnant women to rule out diabetes mellitus, hypertension with edema and proteinuria and non- proteinuric hypertension.

Pregnancy-induced hypertension(PIH): A pregnant woman above 20 weeks of gestation, of age group 21-35 years admitted to OBGY ward fulfilling the following criteria is defined as pregnancy-induced hypertension. Systolic blood pressure (SBP) higher than 140 mm Hg or a rise of at least 30mm of Hg and diastolic blood pressure (DBP) greater than 90 mm Hg or rise of at least 15 mm Hg, both manifested on two occasions at least 6 hours apart in a supine position. Proteinuria of 300 mg or higher in a 24-hour urine collection or protein concentration of 1 gm/1 or higher on two occasions at least 6 hours apart.

Normotensive pregnant women: Pregnant women above 20 weeks of gestation, of age group 21-35 years fulfilling the following criteria. Systolic blood pressure between 110-130 mm of Hg. Diastolic blood pressure between 70-90 mm of Hg in a supine position without proteinuria. The above study subjects divided into two groups, group-1 (n-20) comprised of Normotensive pregnant women and group 2 (n-30) consisting of women with PIH.

Sample Collection: Blood and urine samples collected from the above study subjects. 3ml of blood from the cubital vein received in a plain bottle after explaining the procedure to the study subjects. Serum was separated from the blood samples by a centrifuged machine at 3000 rpm for 10 minutes. Following estimations are carried out on the blood and serum samples by the kit method.

1. Random blood sugar
2. Serum uric acid
3. Blood urea
4. Serum creatinine
5. Serum triglycerides
6. Serum cholesterol

At the same time 24 hours mid stream urine sample was collected and analysed for urinary proteins by dipstick method.

RESULTS

Table1: Comparison of biochemical profile between controls cases (PIH in II trimester)

Parameters	Control subjects(n=20)	Patients(n=30)	p-Value	
Urea	19.40 ± 1.35	20.87 ± 3.87	0.2637	NS
Uric acid	4.520 ± 0.824	4.213 ± 0.825	0.3717	NS
Creatinine	0.860 ± 0.084	0.853 ± 0.130	0.8878	NS
RBS	91.80 ± 14.62	91.53 ± 16.57	0.9674	NS
Total cholesterol	204.10 ± 11.82	210.53 ± 28.22	0.5043	NS
Triglycerides	163.80 ± 5.81	187.20 ± 34.98	0.0487	S

Table 2: Comparison of biochemical profile between controls cases (PIH in III trimester)

Parameters	Control subjects(n=20)	Patients(n=30)	P-Value	
Urea	22.50 ± 3.98	20.80±2.98	0.2339	NS
Uric acid	5.340 ± 1.600	4.727 ± 1.261	0.2955	NS
Creatinine	0.860±0.084	0.973±0.133	0.0261	S
RBS	93.30±11.24	100.67±28.12	0.4415	NS
Total cholesterol	204.10 ± 11.82	217.33 ± 24.50	0.1880	NS
Triglycerides	163.60±8.03	176.13 ± 34.98	0.1083	NS

Table 3: Comparison of biochemical profile between controls and cases

Parameters	Control subjects(n=20)	Patients(n=30)	P-Value	
Urea	20.95± 3.30	20.83 ± 3.39	0.9047	NS
Uric acid	4.930 ± 1.308	4.470±1.079	0.1814	NS
Creatinine	0.860±0.082	0.913±0.143	0.1387	NS
RBS	92.55± 12.71	96.10 ± 23.15	0.5352	NS
Total cholesterol	204.90±12.59	213.93±26.20	0.1586	NS
Triglycerides	163.95 ± 6.89	181.53 ± 29.77	0.0128	S

Table 4: Assessment of Proteinuria in PIH

	Proteinuria in PIH (n=30)	%	Proteinuria in II trimester (n=15)	%	Proteinuria in III trimester (n=15)	%
Without proteinuria	8	26.66%	3	20%	5	33.33%
Proteinuria +1	13	43.33%	6	40%	7	46.66%
Proteinuria +2	9	30%	6	40%	3	20%

%: Percentage

DISCUSSION AND CONCLUSION

The present study was done on Normotensive pregnant women and women with PIH. In this study of PIH routine biochemistry parameters pertaining renal function, glycemic index, Lipid profile and Urine analysis for proteins.Creatinine is an important biomarker of renal function. In this study levels are statistically significant, their mean and SD values (0.973± 0.133) are more than Normotensive pregnant women (0.860± 0.084) and p< 0.01 as shown in table 2. There is a considerable decrease in serum creatinine level of 0.8 mg/ dl or even less in healthy pregnant women when compared to women with

PIH especially in preeclampsia. It may be indicative of decreased renal perfusion by the presence of Creatinine level at term.Serum Uric acid levels are increased in Normotensive (4.520± 0.824) when compared in women with PIH (4.213±0.825). But there is no increase beyond its baseline (5mg/dl). But there is no statistically significant, p<0.01 as shown in table 2.Routine blood glucose estimation studied the glycemic index among normotensive (91.80± 14.62) and women with PIH (91.53± 16.57) which shows no statistically significant (p>0.01) as shown in table 1. All the studies were non-diabetic individuals in PIH.Triglycerides levels are statistically significant when compared with Normotensive pregnant women in the 2nd trimester and overall data there is statistically significant in serum triglycerides PIH women (187.20± 34.98). When compared with Normotensive pregnant women (163.80± 5.81) p<0.01 as shown in table 1.In previous studies, it also reveals that there is a considerable increase in serum triglycerides levels in PIH women when compared with Normotensive and non-pregnant women and means value raised almost two-fold. The principle modulator of this hypertriglyceridemia in estrogen as pregnancy associated with hyperestrogenemia. Oestrogen induces hepatic biosynthesis of endogenous triglycerides which is carried by VLDL[5]. This process may modulate by hyperinsulinism found in pregnancy[6], serum triglycerides concentration is increased much more significantly along with increased endothelial triglycerides accumulation may result in endothelial cell dysfunction in gestosis[7]. Increased triglycerides found in PIH is likely deposited in predisposed vessels such as the uterine spiral arteries and contributes to the endothelial dysfunction, both directly and indirectly through generation of small dense LDL[8]. Moreover, this hypertriglyceridemia may associate with hypercoagulability[9], jaynata *et al.* has revealed in his studies that in contrast to healthy pregnant women the rise in serum triglycerides was statistically significant in preeclampsia than eclamptic patients[10].This study shows that there is a considerable rise in serum triglyceride levels in 2nd trimester than in 3rd trimester and it is statistically significant (p<0.01) than healthy pregnant women (p>0.01). These similarities have suggested that the disorders may share a common pathophysiology. The oxidation hypothesis of atherosclerosis proposes that inflammatory activation of endothelium and circulating blood cells generate free radicals. The impact of these oxygen species increased by the dyslipidemia of atherosclerosis[11].In PIH women qualitative assay for proteinuria was evaluated. There is a significant outcome of renal pathology regarding proteinuria. About 73% of PIH women and non-proteinuric hypertensive women were about 27%, and it is about 1+ (dipstick) in 43% PIH women, and 2+ is about 30% as shown in table 4.A variety of biochemical and biophysical markers have been proposed to predict the development of pre-eclampsia. Friedman and Lindheimer in their review concluded that at present there are no screening tests for pre-eclampsia that are reliable and economical[12].Increased diastolic BP or 2nd trimester MAP predicts gestational hypertension and not pre-eclampsia and its perinatal outcome[13].

REFERENCE

1. Hughes EC (Ed). Obstric- gynaecologic terminology. Philadelphia, USA: FA Davis, 1972.
2. Report of the national blood pressure education program working group on high blood pressure in pregnancy. Am J Obstet and Gynecol 2000; 183: s1-s2.
3. Hypertensive disorders in pregnancy. In cunnigham FG, Gannt NF, Lenovo KJ, Gilstrap III LC, Hanth JC, Wenstrom KD (eds): Williams Obstetrics(21st edn). Mcgrew.
4. Eleen W Selly – journal of clinicall endocrinology and metabolism vol-84, no-6, 1858 – 1861.
5. Glueck, C.J.Fallet et al., (1975) Effects of Oestrogenic compounds on Triglyceride kinetics. Metabolism 24, 537-45.
6. Adegoke,et al.,(2003) fasting plasma glucose and cholesterol levels in pregnant Nigerian women. Nigeria. Postgrad.Med.J.10(1),32-6.
7. Mikhali, M.S et al. 1995. Lipid profile in women with pre-eclampsia: relation between plasma triglycerides levels and severity of pre-eclampsia, J.Assoc. Acad. Minor Phys. 6(1), 43-5.
8. Sattar N et sl. (1997) lipoprotein sub fraction concentration in pre-eclampsia: Pathogenic parallels to atherosclerosis. Obstet. Gynecol. 89(3), 403-8.
9. Kokia E et al. (1990). Maternal serum lipid profile in pregnancies complicated by hypertensive disorders. J Perinat Med (germany) 18(6), 473-8.
10. Jayanta De, Ananda Kumar Mukhopadhyan and pradip kumar Shah. Study of Lipid profile in PIH. Indian Journal of Clinical Biochemistry, 2006/21 (2) 165-68.
11. Witztum J. The Oxidation hypothesis of atherosclerosis. Lancet. 1994; 344: 793-795.
12. Friedman et al. 1999; Prediction and early detection of PIH 201.
13. Conde- Agudelo A et al. Am J Obstet Gynecol 1993; 169: 509-14.

Source of Support: None Declared
Conflict of Interest: None Declared