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Original Research Article

Comparing the Impact of Serum Triglyceride Levels on Maternal Fetal Outcomes between Normal and Hypertensive Pregnancies

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Abstract:

Background: Preeclampsia is a pregnancy is a specific condition characterized byhypertension and proteinuria that remits after delivery. Hypertensive disorders are a long standing threat that endangers the lives of both mother and child. Itcan manifest in four forms during pregnancy i.e., gestational hypertension, chronic hypertension, preeclampsia and eclampsia.

Material and Methods: This is a prospective comparative study, where data was collected from pregnant women, who weremore than 28 weeks of gestation and met the inclusion criteria in Darbhanga medical college and Hospital, Darbhanga, Laheriasarai, Bihar. Comparison was done on blood pressure, triglyceride level, BMI, mode of delivery, maternal and foetal outcome among two groups i.e. hypertensive and normotensive.

Conclusion: Levels of serum triglyceride are significantly increased in hypertensive patients. The mean serum triglyceridelevels also significantly increased with increasein severity of hypertension. Hence it is important to identify the serum triglyceride levels among hypertensive patients.

Keywords: Serum Triglyceride, Pre-Eclampsia, Proteinuria.

Introduction

The prevalence of preeclampsia is around 8-10% in India. Hypertensive disorders are amongst the top 3 causes for maternal deaths in India. Being a multisystem disorder, if not identified early, it not only impairs the functions of kidney and liver but also causes intense vasospasm, HELLP syndrome, postpartum vascular collapse, impairedelectrolyte balance, blindness, etc., effecting almost every organ of the body. Women with pre-eclampsia are also more likely to suffer neonatal death or still birth. It might also effect the fetus by causing intrauterine death, intrauterine growth retardation and prematurity. Pregnancy is a physiological process that is accompanied by various anatomical, physiological and biochemical changes of the entire body. During pregnancy total lipid levels increases by 50%. HDL, LDL and triglyceride levelsalso increase by 15%, 40% and 50% respectively. [1] The etiology of pre-eclampsia is still unknown. Since the etiology and pathogenesis of hypertensive disorders inpregnancy still remains controversial, many markers of endothelial dysfunction have been identified in preeclampsia women. [2,3] Due to insulin resistance and increased estrogen during pregnancy, there is alteration of circulating triglycerides, fatty acids cholesterol and phospholipids due to metabolic changes in both the liver and adipose tissue. . As pregnancy continues, this causes hyperlipidemia consisting principally of increased triglycerides. [4-7] Hypertriglyceridemia is one of the potent riskfactors for metabolic syndrome. Hence altered lipid profile like increased total cholesterol, low-density lipoprotein cholesterol, triglycerides and decreased high-density lipoprotein cholesterol concentrations are associated with an increased risk committed to achieve the SDG (Sustainable Development Goal) of reducing the MMR to less than 70 per lakh live births by the year 2030 from current 130.[8] Hypertensive disorders being one of the major causes for maternal deaths in India, it becomes essential to identify them

and interfere at earliest to curtailuntoward perinatal outcomes. Though many studies [9] have shown that hypertriglyceridemia precedes the onset of preeclampsia, the role of triglyceride levels is hardly established. Hence the current study was undertaken with an aim to show the co- relation between triglyceride levelsand the maternal and fetal outcome. of preeclampsia.

Objectives: To compare the observed serum triglyceride level in bothgroups. To correlate the observed serum triglyceride level with maternal and fetal outcome.

Material and Methods

A prospective comparative study was done, Total 150 casesand 150 control, department of Obs and Gynae at, Darbhanga Medical College and Hospital, Laheriasarai, Bihar. duration on two years. where data was collected from pregnant women, who were more than 28 weeks of gestation and met the inclusion criteria. Preliminary information regarding the participants was collected after obtaining informed consent by using a questionnaire and the blood samples were collected for the estimation of triglyceride levels. The participant was contactedpersonally in hospital after delivery to know the outcome of pregnancy.

Statistical Analysis: Data will be analyzed by percentage, chi-square test, unpaired T-test

Antenatal women attending the above hospitals with more than 28 weeks of gestational period, fulfilling the following.

Inclusion Criteria:

Age 20-35 years

Antenatal normotensive pregnant women beyond 28weeksof gestation

Antenatal women with hypertensive disorders complicating pregnancy beyond28 weeks of gestation

Exclusion Criteria: Diabetes in pregnancy, Chronic hypertension Liver disorders, Renal disorders, Thyroiddisorders.

The triglyceride levels of the patients have been obtained from reports of Department of biochemistry DMCH Hospital Lab, where the patients sample was submitted forestimation.

Sample size: Considering the proportion ofpregnant women with gestational hypertension in India as 7.8% based on the previous study, (29) at absolute error of 3% and 5% level of significance, the estimated sample sizeis 307.

Results

Age distribution among hypertensive subjects varied from 18 years to 34years. Most of the participants in this group were of 25 years. The mean age was 24.5 years with a standard deviation of 3.89 years. Age distribution among normotensive subjects varied from 18 years to 34 years. Most of the participants in this group were of 22 years. Themean age was 23.3 years with a standard deviation of 3.59 years. There was no significant difference in the mean ageof both the groups, hence both the groups were comparablein terms of age.

Table 1: Age distribution among hypertensive and normotensives

Variable	Hypertensive	Normotensive	t-value	p-value
Minimum	18	18	2.710	0.007
Maximum	34	34		
Mode	25	22		
Mean, SD	24.5, 3.89	23.3, 3.59		

Significant if $p < 0.05$

There was no statistically significant difference between both the groups with respect gravida status; therefore, the two groupswere similar in terms of their obstetric status.

Distribution of obstetric status among hypertensive and normotensive patients

Variable	Hypertensives	Normotensive	t-value	p-value
Primigravida	78	73	0.063	0.950
Multigravida	72	77		
Range (Gravida)	1-6	1-5		
Mean, SD	1.73, 0.982	1.72, 0.836		

Gestational age among hypertensive patients varied from28 weeks to 41 weeks. Most of the participants were of 40weeks of gestation. The mean gestational age in the groupwas 37.53 weeks with a standard deviation of 2.9 weeks. The gestational age among normotensives varied from 30weeks to 42 weeks. Most of the participants were of 39weeks of gestation. The mean the gestational age in thegroup was 38.56 weeks with a standard deviation of 1.7 weeks. The birth weight among normotensive subjects varied from 1 kg to 3.9 kg. The mean birth weight was 2.47 in the group with a standard

deviation of 0.66 kg. 83.3% ofthe babies were of normal weight, whereas 15.3% were lowbirth weight weighing less than 2.5 kg but more than 1.5 kgand 1.4% were very low birth weight that is less than 1.5kg.The mean birth weight of the newborns of hypertensive subjects was higher as compared to normotensive and the difference was statistically significant. Distribution of birthweight among two groups.

Birth weight	Hypertensive (kg)	Normotensive (kg)	t-value	p-value
Minimum	1	1		
Maximum	3.7	3.9		
Mean, SD	2.74, 0.45	2.47, 0.66	-4.07	0.000

In the hypertensive group 68.7% of the newborns had no complications. 31.3% of the babies were admitted to NICUas a result various complications amongst which 10% died within first 2weeks of postnatal period. In the normotensive group 94.7% of the newborns hadno complications.5.3% of the babies were admitted to NICU as a result various complications amongst which 2.7% died within first 2weeks of postnatal period. Among the normotensive subjects the mean APGAR score was 6.23 at 1 minute with a standard deviation of 0.85 and at 5 minutes the mean APGAR score was 7.43 with a standard deviation of 0.71.

Discussion

Hypertensive disorders are a long standing threat that endangers the lives of both mother and child. 50-98% of these maternal deaths that occur in India are due to direct obstetric complications which also include hypertensive disorders. [10]

In the current study, none of the participant belonged to teenage pregnancy. According to WHO, each year around 21 million girls aged 15 to 19 years and 2 million girls agedunder 15 years become pregnant in developing regions. Most of these pregnancies are either unplanned orunwanted. Adolescent pregnancy causes ill health and poverty and endangers the life of both mother and child. Globally, complications associated with adolescent pregnancy are one of the leading causes in low and middle-income countries accounting for 99% of global maternal deaths of women ages 15 to 49 years. Some of the complications associated with adolescent pregnancy are eclampsia, puerperal endometritis, and systemic infectionsthan women aged 20 to 24 years. [11] Moreover the psychological, emotional and social needs of pregnant adolescent girls are greater than those of other women. Onthe other hand pregnancy over 35 years old, are also associated with increased risks. Older pregnant women demand more information and have anxiety related to the outcome of their pregnancy. Therefore it is important for healthcare providers to be aware of the different complications associated with older pregnant women in order to meet their individual needs within the maternity services. [12]

The serum triglyceride levels depend on age of the women.It generally increases as the women ages. In the current study there was no significant difference in the mean age among hypertensive and normotensive women. In the current study there was no difference in the obstetric statusamong both the groups. Hence both the groups were comparable in terms of their obstetric status. [13] In both the groups the number of primigravida and multigravida were almost equal. The obstetric index varied from gravida 1 togravida 6 in hypertensive subjects and gravida 1 to gravida5 in normotensive subjects. [14] Another study done by Al- Shaikh G et al., found that history of miscarriage is significantly higher in grand multipara as compared to nulliparous women. Caesarean delivery was also elevated significantly higher in the grand multipara as compared to nulliparous women. [15] Gestational age at birth is associated with both fetal and neonatal deaths, postnatal death and morbidities such as the respiratory distress syndrome and necrotizing enterocolitis. Some of the long-term morbidities such as deafness, blindness, hydrocephaly, mental retardation, and cerebral palsy are also manifested. Preterm birth is defined as birth before 37 completed weeks of gestation. An estimated 15 million infants are born preterm, with resulting complications. [16] It causes around one million neonatal deaths annually and also a significant number of childhood morbidities. Hypertensive disorders in pregnancy are one of the major causes of maternal and prenatal morbidity and mortality. Another study done by Umesawa M et al has found that theprevalence of HDP, gestational hypertension and preeclampsia are 5.2– 8.2%, 1.8–4.4% and 0.2–9.2%, respectively. The factors that increase the risk of gestational hypertension can be genetic or non-genetic. Some of the factors such as body mass index, anemia and illiteracy are the important modifiable risk factors. Whereas some other factors like maternal age, primiparous,multiple pregnancy, HDP in previous pregnancy,gestational diabetes mellitus, preexisting hypertension, preexisting type 2 diabetes mellitus, preexisting urinary tract infection and a family history of hypertension, type2 diabetes mellitus and preeclampsia are nonmodifiable risk factors. Lipoprotein levels in pregnancy have important implications for the developing fetus and newborn. Cholesterol is most important for the normal development of fetus and dyslipidemia is linked to adverseperinatal outcomes. Dyslipidemia also has associations with the hypertensive disorders of pregnancy and gestational diabetes. In the hypertensive group 68.7% of the newbornshad no complications.

[17] 31.3% of the babies were admitted to NICU as a result various complications amongst which 10% died within first 2 weeks of postnatal period. In the normotensive group 94.7% of the newborns had no complications. 5.3% of the babies were admitted to NICU as a result various complications amongst which 2.7% diedwithin first 2 weeks of postnatal period [18]. The frequency of complications was higher among newborns of hypertensivesubjects and the difference of distribution among bothgroups was statistically significant.

Conclusion

The serum triglyceride levels is one of the important indicator of maternal and fetal health status of a pregnant women. The levels of serum triglyceride are significantly increased in hypertensive patients. The mean serum triglyceride levels also significantly increased with increase in severity of hypertension. Hypertension in pregnancy per se is associated with varied maternal and fetal complication.

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