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Original Research Article

Deranged Liver Function Test in Pregnancy with Hypertensive Disorder and Its Association with Foeto-Maternal Outcome

Prakriti Samadhiya[1], Anjali[1], Shilpy Kumari[2], Piyush Kumar Gupta[3]

[1]Senior resident, Obstetrics and Gynaecology Sukh Sagar Medical College, Jabalpur
[2]Krishnadevi Deviprasad Kejriwal Hospital, Mujaffarpur, Bihar
[3]Associate Professor, Dept of Community Medicine, Geetanjali Institute of Medical Sciences, Jaipur, Rajasthan

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Corresponding Author: Dr. Piyush Kr Gupta
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Abstract:

Objective: To assess the prevalence of' deranged liver function test in pregnant patients presenting with hypertensive disorders regularly attending the antenatal clinic and to identify its effect on foeto-maternal outcome.

Material and Method: it was a prospective study of 115 pregnant women who were attending the antenatal clinic during their second trimester and third trimester with hypertensive disorder with deranged liver function test. They were also evaluated for liver function test like serum transaminases and alkaline phosphatase. All the enrolled mothers were under close follow-up and they were checked for the development of any intrapartum, postpartum complications, mode of delivery and development of any foetal complications.

Results: Present study shows the occurrence of' Deranged LFT in hypertensive pregnancy was 37.39%. 62% of' the pregnant mothers with hypertension with abnormal LFT developed antenatal complication; most common Antenatal complications were eclampsia. 21% developed postnatal complication. 42 subjects developed foetal complication in which 25.5% had NICU stay.

Conclusion: In a sub Himalayan region like Jalpaiguri where the occurrence of Hypertension in pregnancy is comparatively high. Deranged liver function test is associated with adverse foeto-maternal outcomes.

Keyword: Hypertensive Disorder In Pregnancy, Deranged Liver Function Test, Feto-Maternal Outcome.

Introduction

Hypertensive disorders in pregnancy are commonly observed medical conditions seen during pregnancy, it's incidence are 5-10% (Martin j 2001) [1] This condition includes mild Preeclampsia and severe preeclampsia, Eclampsia (convulsions, coma). Hypertensive disorder in pregnancy defined as blood pressure as high when it is >140mm Hg systolic or 90 mmHg diastolic at two separate times, more than four hours apart in a women after 20 weeks of pregnancy.(ACOG2002) [2]

In Severe preeclampsia there is one or more of high blood pressure ≥160 mmHg systolic, or ≥110 mmHg diastolic, noticed on two occasions at least 6 hours apart; with proteinuria ≥5g in a 24 hour urine collection; along with other functional symptoms like headache, hyperreflexia, oliguria, epigastric pain, impaired liver function, and HELLP syndrome. [3] A liver function test abnormalities occur in 3% of all pregnancies, and hypertension in pregnancy is most common cause. [4] Alanine transaminase levels between 2 and 25 U/L and aspartate transaminase levels between 4 and 32 U/l are taken as normal in pregnancy the values are outside this range, it signifies derangement of liver function which can have multiple causes. [5] There are many evidences to prove that liver function test derangement is directly related to severity of preeclampsia. Many factors contributes to development of disease spectrum, which includes onset of vasospasm, activation of coagulation system, oxidative stress, increased inflammatory response and ischemia which leads to feto-maternal complication. Liver dysfunction in preeclampsia has serious Periportal hemorrhagic necrosis in periphery of liver lobule is probable cause of elevated liver enzymes. [6] Hemorrhage under the liver capsule can be so severe that the capsule ruptures and causes life-threatening intra peritoneal bleeding. [7]

Hypertensive disorder in pregnancy occurs chiefly in primigravida and also in reduced uteroplacental blood flow conditions such as obesity, multiple pregnancy, renal disorders, diabetes mellitus, and emotional stress. [8] Severe maternal complications are abruption placenta (10%), HELLP syndrome (11%), disseminated intravascular coagulopathy (6%), aspiration pneumonitis (7%), pulmonary edema (5%) and death (1%). There is risk for the fetus including intrauterine growth retardation, prematurity, low Apgar scores, death etc. Our aim of this study was to detect the prevalence of deranged liver function test and its effect on feto-maternal outcome.

Materials and Methods:

It was a hospital based prospective observational study conducted in obstetrics and gynaecology department at District hospital Jalpaiguri (West Bengal), India over a period of one year between 2019 to 2020. 115 Pregnant women with hypertensive disorders admitted in obstetrics and gynaecology department were included in the study.

Patients with Liver diseases like intrahepatic cholestasis in pregnancy, acute fatty liver in pregnancy, liver cirrhosis, viral hepatitis, Wilson's disease, portal hypertension, hemochromatosis, autoimmune hepatitis, congenital liver disease, hepatic adenoma, hepatocellular carcinomas and Pregnancies with any systemic illnesses, history of chronic hypertension, hematologic disease, and patients taking hepatotoxic drugs were excluded from the study.

This study was conducted after taking approval by ethical committee. All enrolled mothers were evaluated by detailed history; examination and regular investigations. All the enrolled mothers were under close follow-up and were evaluated for development of intrapartum, postpartum complications, mode of delivery and development of any fetal complications.

Observation and results

Most of the women were found to be between age group of 21-25 (40.87%) years. The mean age of the study subjects was 22.00±4.33 years. Most of the population belongs to lower socioeconomic status class i.e. 43.5%. Out of 115 subjects abnormal Liver function test was seen in 43 (37.4%) subjects (table 1).

Table 1: Baseline characteristics of study population

	No.	%
Age group		
16-20 years	41	35.65%
21-25 years	47	40.87%
26-30 years	22	19.13%
31-35 years	4	3.48%
41-45 years	1	0.87%
Gravida		
Primi	89	77.39%
Multi	26	22.61%
BMI		
15-20 kg/m^2	32	27.83%
20-25 kg/m^2	66	57.39%
25-30 kg/m^2	15	13.04%
30-35 kg/m^2	2	1.74%
SES		
Lower	50	43.48%
Lower Middle	39	33.91%
Middle	11	9.57%
Upper Middle	15	13.04%

Table 2: Comparison of mode of delivery in deranged LFT and normal LFT in hypertensive pregnancy

Mode of delivery	LFT Normal (n=72)	LFT Abnormal (n=43)	Total
SVD	21 (29.17%)	9 (20.93%)	30
Forceps	2 (2.78%)	0	2
Ventouse	2 (2.78%)	1 (2.33%)	3
LSCS	47 (65.28%)	33 (76.74%)	80

LSCS rate was significantly higher in subjects with abnormal LFT (76.74%) compared to subjects with normal LFT (65.28%).

Table 3: Comparison of Complications in deranged LFT and normal LFT in hypertensive pregnancy

	LFT Normal (n=72)	LFT Abnormal (n=43)	Total
Antenatal complications			
Eclampsia	6(8.3%)	11(25.6%)	**0.012**
Non progress of labour	2(2.8%)	4(9.3%)	0.194
Oligohydramnios	2(2.8%)	1(2.3%)	1.000
Polyhydramnios	1(1.4%)	0(0.0%)	1.000
Postdated	6(8.3%)	1(2.3%)	0.254
Preterm labour	5(6.9%)	4(9.3%)	0.726
PROM/ PPROM	5(6.9%)	6(14.0%)	0.326
Nil	45(62.5%)	16(37.2%)	**0.009**
Postpartum complications			
Cardiac arrest	0	1(2.3%)	0.374
Eclampsia	0	4(9.3%)	**0.018**
Hypertension	1(1.4%)	0(0.0%)	1.000
PPH	4(5.6%)	2(4.7%)	1.000
Wound infection/ Hematoma	7(9.7%)	2(4.7%)	0.480
Nil	60(83.3%)	34(79.1%)	0.622

Most common antenatal complications were asymptomatic eclampsia, non-progress of labour, post-dated, PPROM, preterm labour, PROM, polyhydramnios.

Among this antenatal complications, eclampsia were found to be statistically significant in abnormal LFT women compared to normal LFT with p values being <0.012. In postpartum period also eclampsia was more commonly seen in subjects with abnormal LFT.

In the present study, Hyperbilirubinemia, low birth weight, NICU admission were the fetal complications which were found to be higher in abnormal LFT group when compared to Normal LFT group.

Table 4: Comparison of fetal Complications in deranged LFT and normal LFT in hypertensive pregnancy

Fetal Complications	LFT Normal (n=72)	LFT Abnormal (n=43)	Total
Birth asphyxia	2(2.8%)	4(9.3%)	0.194
Hyperbilirubinemia	9(12.5%)	5(11.6%)	1.000
Hypoglycaemia	2(2.8%)	3(7.0%)	0.361
Neonatal sepsis	1(1.4%)	1(2.3%)	1.000
NICU admission	10(13.9%)	11(25.6%)	0.116
Preterm	4(5.6%)	5(11.6%)	0.291
Still birth	0(0.0%)	1(2.3%)	0.374
Low birth weight	11(15.3%)	12(27.9%)	0.101
Very low birth weight	5(6.9%)	0(0.0%)	0.155
Nil	28(38.9%)	1(2.3%)	**<0.01**

Discussion

Our study was hospital based prospective observational study done in 115 women attending antenatal clinic in District hospital, Jalpaiguri for one year from1st February, 2019- 31st January, 2020. Our study was aimed to evaluate the prevalence of deranged liver function test in pregnancy with hypertensive disorder and foeto-maternal outcome in such cases.

The present study found the mean (SD) age of the subjects was 22.82 (4.33) years and majority of the patients were in the age group of 18-25 years. Study by Pusuloori R et al [9] found that among 50 pregnant women with PIH, mean age group was 22.5 years and most patients were in age group of 21-25 years. Although Lodi R et al [10] in their study found higher mean age of the cases with 27.53 years, which may be explained by different study design or setting. Pusuloori R et al [9] in their study observed the number of primi gravida was 50% and multi were 44%. In our study primi gravida were 77.4%. The mean total bilirubin, indirect bilirubin, SGOT & SGPT were high compared to acceptable upper limit in the respective population was observed in the current study. The study by Lodhi R et al [10] found the mean (SD) value of total bilirubin, indirect bilirubin, SGOT & SGPT were similarly higher among the cases of PIH than controls with normal pregnancy. Rath W et al [11] found increased level of liver function test in severe pre–eclampsia. Jaleel A et al [12] noticed highly significant rise in LDH, bilirubin and AST, ALT level in women with pre-eclampsia compared to normotensive pregnant women. Pusuloori R et al [9]. Observed that in total cases, 68% vaginally delivered and 32% cases were delivered by cesarean, which corresponds with our study findings, where we found that 26% of the subjects had spontaneous vaginal delivery, whereas, 69.57% had Caesarian section. Agrawal S et al [13] found 43.16 % subjects had spontaneous vaginal delivery, 38.8 % delivered after successful induction of labor, and 18.01 % needed caesarean delivery. Our study found that 62% of the pregnant mothers with hypertension with abnormal LFT developed antenatal complication and among them eclampsia, acute kidney injury, abruptio placentae, Preterm labor were more than any other complications. Our study found that 21% of the pregnant mothers of PIH with abnormal LFT developed postnatal complication and among them eclampsia was more than any other complications. Agrawal S et al [13] found 10.24 % had eclampsia, 4.03 % had abruptio placentae, 3.7 % had thrombocytopenia,2.4 % subjects developed acute renal failure, 1.24 % developed HELLP syndrome, 0.62 % subjects had pulmonary edema and postpartum haemorrhage, and 0.62 % had cortical blindness. 0.3 % of subject required intubation. Kozic et al] [14] in a study of PIERS dataset noted that of the 2008 women 53 % had deranged liver function test result. Adverse maternal outcome was found in deranged liver function test group than in normal results. The present study found that 42 subjects developed foetal complication in abnormal LFT group and 11.6% of the subjects delivered babies with prematurity, 28% with low birth rate baby, 25.5% had NICU stay and 2.3% with intra uterine death. The study by Mahajan P et al [15]. reported, that in 69 pre-eclampsia cases with abnormal liver enzymes, 28.90% developed FGR, 8.69% developed FD, 14.49% MSL, 4.34% IUD, 49.20% NICU stay because of Prematurity in 47.05% babies, MAS in 5.88%, FGR in 44.11% and ELBW in 2.94% neonates. Aali B S [16] found that 47% premature births, 6% IUD and LBW in 34% preeclamptic patients with abnormal liver enzymes. Yucesoy G et al [17] found fetal growth restriction in 29.4% and low birth weight in 34% preeclampsia patients with deranged liver enzymes. Mahajan P et al [15] concluded that maternal complications were common among the pregnant mothers of PIH with abnormal LFT and these complications were severe Preeclampsia, eclampsia, post-partum haemorrhage. Fetal complications among cases were meconium stain, fetal growth restriction, intrauterine death and NICU stay of the baby. Lodhi R et al [18] study shows that serum total bilirubin, SGOT, SGPT, was significantly raised in the cases compared to controls; the present study also found significant association between any maternal complication and total bilirubin, indirect bilirubin, SGOT and SGPT. To elicit the association a study with higher design with larger sample size would be more appropriate.

Conclusion & recommendations

Based on the finding of this study it can be concluded that in a sub Himalayan region like Jalpaiguri where the occurrence of Hypertensive disorders in pregnancy are comparatively high, which is associated with foeto-maternal complications. Our study suggests that early screening and intervention of pregnant women for such disorders can have profound implication on the health of pregnant women as early detection and intervention may improve the foeto-maternal outcome in such cases.

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