ORIGINAL RESEARCH PAPER

Obstetrics & Gynaecology

STUDY OF ABNORMAL LIVER FUNCTION TEST IN THE THIRD TRIMESTER OF PREGNANCY AND ITS MATERNAL AND PERINATAL OUTCOME

KEY WORDS: Abnormal LFT in pregnancy, Pre-eclampsia, HELLP syndrome, Perinatal Outcome

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ABSTRACT

Abnormalities in liver function tests during pregnancy are a commonly encountered problem often associated with serious consequences especially when it occurs in the third trimester. The spectrum of abnormal liver functions in pregnancy can be fairly wide and diagnostic work up often challenging.This study was performed to assess the causes of deranged liver function in the pregnant population and also to prospectively determine the outcome of liver dysfunction in pregnancy. **Materials And Methods-** The present study was conducted in the Department of Obstetrics and Gynaecology, RAMA medical college and hospital Kanpur, over a period of 14 months starting from July 2022 to September 2023. 100 pregnant women with abnormal liver dysfunction were studied prospectively.Women with chronic liver disease and drug induced abnormal liver function test were excluded. **Result-** The incidence of PIH was seen as the most common cause, found in 63% of women with liver dysfunction followed by HELLP syndrome which was found im 16% of patients.) with HELLP. the majority (45 %) women had AST elevation of less than 100 IU/L and 47 % had ALT elevated in 100–500 IU/L range. 66% delivered vaginally, 34% by cesarean section due to serious obstetric indications. 5% women had IUD. Fetal outcome in majority of cases was alive and healthy at term (64%) whereas 15 (15%) cases had preterm live births. IUGR was observed among 16% of the babies. **Conclusion-** Pregnancy-specific disorders are the leading cause of abnormal liver function test during pregnant state partic:ularly in the third trimester. Pre-eclampsia-related disorder is the commonest. Gestational age of pregnancy and relative values of various liver function tests in different pregnancy-specific and pregnancy nonspecific disorders appear to be the best guide to clinch the diagnosis.

INTRODUCTION

Liver disease is a rare complication of pregnancy affecting approximately 3% to 5% of all pregnancies(1). The physiological changes in a pregnant woman can confuse the clinician by some non specific symptoms such as nausea, vomiting and abdominal pain. Alterations of laboratory test results representing the physiological changes of pregnancy include a threefold to fourfold increase in the level of alkaline phosphatase and also an increase in the synthesis of clotting factor whereas there is a decrease in the level of antithrombin 3 and protein S, serum albumin and total proteins.

Liver involvement in pregnancy can be of 3 types i.e. liver disease as a consequence to pregnancy, liver disease coincidental to pregnancy and pregnancy in patients with pre-existing liver disease(2). Liver diseases which can be due to pregnancy as a consequence of changes in pregnancy include intrahepatic cholestasis of pregnancy (ICP), acute fatty liver of pregnancy (AFLP) and, hemolysis, elevated liver enzymes and low platelets count (HELLP) syndrome. Apart from these, liver abnormalities are often encountered in patients with pre-eclampsia (PE) and hyper emesigravidarum (HG). Coincidental or pre-existing liver disease include acute and chronic viral hepatitis, cirrhosis of liver, vascular alterations such as Budd–Chiari syndrome (BCS), drug induced hepatotoxicity, autoimmune liver diseases, and metabolic disorders (3). These liver disorders in pregnancy may adversely affect maternal and fetal outcome.

The present study was done with the objective to study the clinical profile, incidence and possible causes of derangements of liver function test at the largest tertiary hospital in Kanpur as well as to study the foetomaternal outcome in these women.

MATERIALS AND METHODS

The present study was conducted in the Department of Obstetrics and Gynaecology, RAMA Medical College and Hospital Kanpur, over a period of 18 months from July 2022 to September 2023. All pregnant women with abnormal liver dysfunction admitted in the obstetric unit of hospital were studied prospectively, and 100 such women were included in the study. Women with chronic liver disease and drug-induced abnormal liver function test were excluded.

After obtaining the demographic, menstrual and obstetric details, the specific symptoms related to liver dysfunction such as pruritus, persistent vomiting, yellowish discoloration of urine, blurring of vision, diminished urine output, upper abdominal discomfort and anorexia were asked.

A detailed history of any drug intake such as paracetamol, antitubercular drugs, oral contraceptive and history of sickling was noted. Specific history taken in view of abnormal liver function is history of blood transfusion, tattoos, alcohol consumption, and hyperlipidaemia was noted.

A thorough general and obstetric examination was carried out in all. In all cases of severe gestational hypertension and pre-eclampsia, clinical signs and symptoms of ICP, infective hepatitis or other disorders, all available LFT excluding LDH were ordered as LDH was a paid investigation and patients refused to get it done. Some more definitive tests to aid identification of underlying cause such as platelet count viral serology for hepatitis, peripheral smear.These women were followed up till delivery and along with their neonates, up to 7-day post-partum.

Diagnostic criteria for different underlying pathologies were based upon following parameters [4]:

- HELLP syndrome: complete: raised bilirubin, elevated AST (>70 IU/L), low platelet count (<100,000/μL), haemolysis (suggestive peripheral smear with red cell fragmentocytes along with increased reticulocytes). Partial: elevated AST (>40 IU/L), low platelet count

(<150,000/μL), the absence or presence of haemolysis.

- Pre-eclampsia-associated liver dysfunction: Elevated transaminases or bilirubin in the presence of hypertension to the extent of 140/90 mmHg or more on two occasions >6 h apart, proteinuria (1+) after 20 weeks of pregnancy.
- Intrahepatic cholestasis of pregnancy (ICP): Pruritus without any skin problem or allergy with elevated transaminases. Relieved after delivery.

Acute Fatty Liver of Pregnancy (AFLP) Six or more of the following—vomiting, abdominal pain, polydipsia or polyuria, encephalopathy, leucocytosis, elevated bilirubin, elevated transaminases, marked hypoglycaemia, renal impairment, coagulopathy, elevated urate, ascites or bright liver on ultrasound.

- Hepatitis: elevated transaminases or bilirubin in the presence of positive hepatitis viral serology.

RESULT:

Table 1

Majority of the women were young and aged less than 30 years, were un-booked, of low parity. The most common presenting complaint was oedema (25 %) followed by decreased urination and visual symptoms with headache

Demography and presenting symptoms

Demographic feature (n = 100)		Number	%
Age (years)	<20	22	22
	21-30	55	55
	>30	23	23
Parity	Po	52	52
	P1	31	31
	P2 and above	17	17
ANC care status	Booked	26	26
	Unbooked	74	74
Presenting complaints	Oedema	15	15
	Decreased urination	15	15
	Itching	10	10
	Epigastric pain	10	10
	Headache	13	13
	Visual symptoms	12	12
	Fever	4	4
	Miscellaneous	7	7

Table 2

In the third trimester Pregnancy induced hypertension was seen as the most common cause found in 63 out of the 100 patients followed by HELLP syndrome which was found in 17% of the patients.

Causes of abnormal LFT in the third trimester

Preeclampsia	65	65%
HELLP syndrome	17	17%
Eclampsia	6	6%
Hepatitis	5	5%
Malaria	4	4%
Intrahepatic cholestasis pf pregnancy	2	2%
Acute fatty liver of pregnancy	1	1%

Table 3

Amongst various abnormalities of LFT, the majority (45 %) women had AST elevation of less than 100 IU/L and 47 % had ALT elevated in 100–500 IU/L range. The commonest value of bilirubin level was between 1 and 2.5 mg/dL found in 47 % cases. Only 7–10 % women exhibited bilirubin values of >10 mg/dL and/or AST/ALT values >500 IU/L. Alkaline phosphatase between 150 and 550 IU/L was found in 80 % women and more than 550 IU/L in one woman only.

Table 4

S. No.	LFT	Number	Percentage
1	Alkaline Phosphatase		
(a)	50-149	15	15
(b)	150-550	80	80
(c)	551-1000	5	5
(d)	>1000	-	-
2	Aspartate Transaminase		
(a)	<100	45	45
(b)	100-500	45	45
(c)	500-1000	6	6
(d)	>1000	4	4
3	Alanine Transaminase		
(a)	<100	41	41
(b)	100-500	47	47
(c)	500-1000	8	8
(d)	>1000	4	4
4	Total Billirubin (mg/dl)		
(a)	<1	20	20
(b)	1-2.5	47	47
(c)	2.6-5	13	13
(d)	5.1-10	10	10
(e)	>10	10	10
5	Direct Billirubin (mg/dl)		
(a)	<0.3	12	12
(b)	0.3-1.5	50	50
(c)	1.6-2.5	8	8
(d)	2.6-5	10	10
(e)	>5	20	20

Majority of women, i.e. 66 (66 %), delivered vaginally out of whom 36 (36) had spontaneous onset. Labour was induced in 30 women because of obstetric indications and 24 delivered, whereas the remaining 6 out of the 30 of this group underwent caesarean section needing delivery urgently due to worsening foetomaternal condition in severe pre-eclampsia. 28 additional women delivered by caesarean section due to various obstetric indications making a total of 34 (34 %).

Table 5

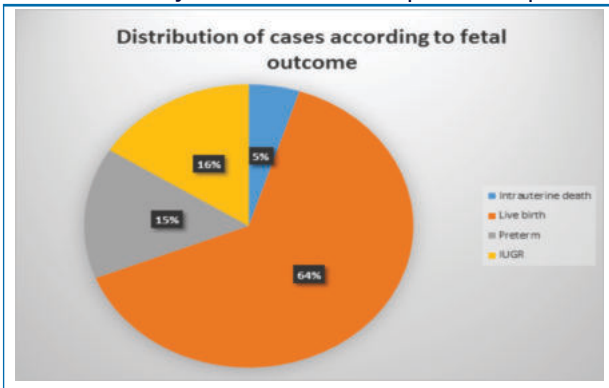
Distribution according to birth weight and APGAR score at 5 mins

Mode of Delivery			ICU admissions n=34	
Vaginal delivery (66%)		LSCS n =34 (34%)	Mortality n=5	Recovered n=29
Spontaneous n=36	Induced n=30			

Table 6

Demonstrates that 5% women had intrauterine death. Fetal outcome in majority of cases was alive and healthy at term (64%) whereas 15 (15%) cases had preterm live births. Intrauterine growth restriction was observed among 16% of the babies.

Birth Weight (kg)		
1-2.5 kg	37	37%
2.5-3.5kg	56	56%
>3.5kg	7	7%
APGAR score at 5 mins		
<4	6	6%
4-7	21	21%
>7	73	73%



DISCUSSION

Liver diseases in pregnancy is associated with various complications among both mother and fetus. The present study documented incidence of liver disease in 1.68% in pregnancy. However Rathi et al in their study reported much lower prevalence (0.9%) of liver disease in pregnancy 5 .Mishra et al also documented 0.9% incidence of liver disease[6].The observed discrepancy in incidence rate of liver disease between present study and reference study could be due to difference in inclusion criteria.

The incidence of abnormal LFT in pregnancy is higher in younger age group. In our study, majority of women were of low socio-economic status, not booked for antenatal care and generally got admitted in the hospital only as emergency. Similar facts are observed in other Indian studies too [5, 7–9].

Majority of the women were young and aged less than 30 years, were un-booked, of low parity In the third trimester Pregnancy induced hypertension was seen as the most common cause found in 63 out of the 100 patients followed by HELLP syndrome which was found in 16% of the patients.

AST and ALT are the most commonly used markers of hepatocyte injury. AST is present in cytosolic and mitochondrial isoenzymes and is found in the liver as well as many other tissues. It is less sensitive and specific for the liver. ALT is also a cytosolic enzyme is found in its highest concentrations in the liver and is more specific to the liver [10]. Hepatocyte necrosis in acute hepatitis, toxic injury or ischaemic injury results in the leakage of enzymes into the circulation. Various liver diseases are associated with typical ranges of AST and ALT levels. ALT levels often rise to several thousand units per litre in patients with acute viral hepatitis.. In cases of viral hepatitis, commonly the transaminases are high reaching >500–1000 IU/L and bilirubin often crosses 10 mg % in acute phase. In our study, the mean values of abnormal LFT were more or less followed the same pattern. It is apparent that after the gestational age, the degree of derangements of LFT can guide the approach to diagnosis further.

In our study, out of the 100 women, only 2% woman had intrahepatic cholestasis of pregnancy. The incidence of ICP varies from 0.1 to 1.5 % of pregnancies [12]. Our case presented with 38-week gestation, and her laboratory investigation shows marked elevation in alkaline phosphatase level with moderate increase in serum bilirubin level. Many women with pre-eclampsia-related liver function abnormalities do not have symptoms, and only awareness of associated possibility of liver problem can make the clinician to ask for liver function tests leading to timely detection and proper timely management in these cases. This can avoid life-threatening complications.

The factor responsible for the higher maternal and foetal morbidity and mortality appear to be due to lack of facilities, lack of awareness regarding the pregnancy-specific conditions which may lead to worsening of the outcome of pregnancy especially in the presence of abnormal liver function, poor nutrition, prevalence of anaemia, delay in seeking medical advice and delay in referral to the tertiary care hospital. Many of these women when brought to the referral hospital are already in moribund condition and often do not respond to treatment.

CONCLUSION:

Pregnancy-specific disorders are the leading cause of abnormal liver function test during pregnant state particularly in the third trimester. Pre-eclampsia-related disorder is the commonest amongst these. Abnormal LFT may not be noticed in the absence of awareness particularly when jaundice is not the presenting feature. If a systematic approach is adopted, the cause is often apparent. The gestational age of pregnancy particularly in the presence of relevant clinical features may be the first step. This step when followed by the relative values of various liver function tests in different pregnancy-specific and pregnancy nonspecific disorders appear to be the best guide to clinch the diagnosis. Early and timely joint care by the obstetric and medical team can bring the best results in this so far grim situation in the developing world.

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