Original Research Article

Study of liver Disorders during pregnancy and fetomaternal outcome in a tertiary care hospital

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Abstract

Background: Liver disease in pregnancy encompasses a spectrum of diseases which causes abnormal liver function tests. The liver disorders are associated with significant maternal and foetal morbidity and mortality. The present study was done with objective to study incidence, clinicopathological correlation of liver disorder during pregnancy and its impact on maternal and foetal outcome.**Methods:** This prospective observational study was conducted in Department of Obstetrics and Gynaecology, NSCB Medical College Jabalpur. Eighty-five antenatal cases, on the basis of inclusion criteria were studied prospectively. Those subjected to detailed history and examination, clinical symptoms suggestive of liver disorders followed by all available LFTs including LDH along with some more definitive tests to aid identification of underlying cause and followed up till delivery in terms of maternal and foetal outcome. **Results:** The incidence of the liver disorders in pregnancy was 0.86%. In study group, 76.5% cases were between 20-30 years of age,72.9% cases were primigravida and 90.59% cases presented in third trimester of pregnancy. In this study, 76.4% presented with pregnancy specific liver disorder, of these 32.9% had pre-eclampsia, 11.7% had eclampsia, 11.7% had HELLP syndrome. 16.4% with ICP, AFLP 2.3%and Hyperemesis gravidarum in 1.1% cases. Maternal mortality was 10.58% and morbidity was 34.12%. Live birth 61%, still birth 38.82%, preterm 21.1% and IUGR 24.7%. NICU admission required in 28.57% cases. **Conclusions:** Regular antenatal check-up, screening and diagnosing liver disorder at an earliest, proper treatment and timely referral to higher centres can save the lives of many mothers and foetuses.

Keywords: Abnormal liver function test in pregnancy,Pre-eclampsia,HELLPsyndrome.

Introduction

Pregnancy can be considered as a typical clinical state during which various physiological changes occur in body that influence body organs and to liver also.Liver disorders complicate 3-5% of pregnancies and constitute an important cause of neonatal and maternal morbidity and mortality.[1] High levels of serum estrogen and progesterone affect all the major functions of the liver such as metabolic, synthetic, and excretory function during pregnancy. Liver diseases in a acute or chronic course can alter the foetomaternal outcome due to various hormonal, hemodynamic and immunological changes of pregnancy.Few classical physical findings of liver diseases such as spider angiomas and palmer erythema can also be seen during pregnancy due to increases level of hormone estrogen. 14% maternal and 60% perinatal mortality accounts for it.[2]Liver disorders can complicate nearly 3% of pregnancies. Liver disorders during pregnancy can broadly be classified as those related topregnancy and those just coincidental (occurring during pregnancy or pre-existing).The most common causes of liver abnormal functioning are those related to pregnancy which can be further divided into two categories, with or without preeclampsia. Common conditions unique to pregnancy are Hyperemesis gravidarum (HG), HELLP (haemolysis, elevated liver enzymes,and low platelets) syndrome, intrahepatic cholestasis of pregnancy(ICP), preeclampsia, acute fatty liver ofpregnancy (AFLP). Coincidental liver diseases can occur in any trimester but pregnancy-related liver disorders have characteristictrimester-specific clustering in their occurrence and can resolve either spontaneously or following delievery. [3,4]Extreme vigilance in recognizing physical and laboratory abnormalities is a prerequisite for an accurate diagnosis. This could lead to a timely intervention and successful outcome. Viral hepatitis is the most common cause of jaundice in pregnancy followed by cholestasis. The most common viruses responsible for viral hepatitis are hepatitis A (HAV), hepatitis B (HBV), hepatitis C (HCV),hepatitis E virus (HEV).Jaundice is the most common symptom of acute hepatitis. In developing countries like India, hepatitis E is the commonest cause of fulminant hepatic failure in pregnancy, mostly occurring in the third trimester of pregnancy leading to high maternal mortality ranging from 15-45%.[2] Liver disease in pregnancy can manifest as a benign disease with abnormal elevation of liver enzyme levels and a good outcome, or it can manifest as a serious entity affecting hepatobiliary function and resulting in liver failure and death to the mother and her fetus.

There are no clinical markers that predict the course of a pregnancy and the pathophysiologic mechanism are not always understood, but

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knowledge and management of the preconception liver disease and efficacious pre-pregnancy and prenatal care are essential.

Methods

After obtaining ethical approval from institutional ethical committee, the present prospective observational study conducted at Department of Obstetrics and Gynaecology,NetajiSubhash Chandra Bose Medical College Jabalpur (M.P.) between 1st March 2017 to 31st August 2018. Out of 9900 antenatal cases admitted in obstetric wards , 85 cases with deranged liver function test or with suspicion of liver diseases in pregnancy were taken and recorded in proforma and analysed.Statistical analysis was done by applying student t- test and ANOVA test wherever needed. P value less than 0.05 was considered to be statistically significant.

Inclusion Criteria

1.All pregnant women with deranged liver function tests.

2.Patients who were clinically suggestive of liver abnormality.

Exclusion Criteria

1.Women with chronic liver disease and drug induced abnormal liver function tests.

1.Pregnant women with any other associated systemic disease.

After obtaining the demographic details of the study cases, the specific symptoms related to liver dysfunction such as persistent vomiting, yellowish discoloration of urine, pruritus epigastric pains were asked. History of blood transfusion and drug intake were noted. Lab investigation like: liver function tests (LFT), renal function tests (RFT), Lactate dehydrogenase (LDH), Complete blood count (CBC), Random blood sugar (RBS), and peripheral smear for malaria parasite, IgM anti HAV, HBsAg with Anti HCV urine routine and microscopy were done.All study cases were followed up till delivery.

Diagnostic criteria for different underlying pathologies were based upon following parameters.[5]

Pre-eclampsia associated liver dysfunction: - Elevated transaminases or bilirubin in the presence of hypertension to the extent of 140/90 mm Hg or more on two occasion >6hr apart, proteinuria (1+) after 20wks of pregnancy.

Eclampsia: - Pre-eclampsia with convulsion.

HELLP Syndrome: -Hemolysis (elevated LDH, fragmented RBCs in peripheral smear), elevated liver enzymes, low platelet count.

Intrahepatic cholestasis of pregnancy: -Pruritis without any skin problem or allergy with elevated transaminases.

Acute fatty liver of pregnancy: -As per Swansea criteria for diagnosis of Acute fatty liver of pregnancy, six or more of the following – vomiting, abdominal pain, encephalopathy, leucocytosis, elevated bilirubin, elevated transaminases, marked hypoglycaemia, renal impairment, coagulopathy, elevated uric acid, ascites or bright liver on USG.

Viral hepatitis: - Elevated transaminases and bilirubin in the presence of positive hepatitis viral serology.

Results

There were 85 cases diagnosed as liver disorders during pregnancy out of 9,900 antenatal patients admitted, giving incidence of 0.86% in present study. Majority of cases (76.5%) were observed in age group 20-30 years and were primigravida.Most of the cases were unbooked. 90.59% of the women presented in third trimester of pregnancy. Table 1 shows the demographic profile of patient with liver disorder in pregnancy.

Table 1: Demographic profile

Demographic	Features	Number	Percentage (%)
Age	<20	12	14.1
	20-30	65	76.5
	31-40	8	9.4
	>40	0	0.0
ANC Care	Booked	17	20
	Unbooked	68	80
Trimester wise	<20	2	2.35
	20-28	6	7.05
	>28	77	90.59
Gravidity	Primi–gravida	62	72.9
	Multi-gravida	23	27.1

In the Table2, 65/85 (76.4%) women had pregnancy specific liver dysfunction, out of which 28(32.9%) women had preeclampsia, 10(11.7%) had elcampsia and 10(11.7%) had HELLP syndrome. Intrahepatic cholestasis of pregnancy occurs in 16.4% cases, Acute fatty liver of pregnancy cases were 2.3%, Hyperemesis gravidarum cases were 1.1%, viral hepatitis cases were 20(23.5%). It is pregnancy nonspecific cause of liver disorder, out of viral hepatitis cases, 50% were HEV positive, 35% were HBV positive and 15% were HAV positive cases,so hepatitis E is found to be most common viral hepatitis in pregnancy.

Table 2: Distribution of cases according to spectrum of liver disorders associated with pregnancy

Liver Disorder	Frequency	Percentage (%)
Pre-eclapmsia	28	32.9
Eclampsia	10	11.7
HELLP Syndrome	10	11.7
Viral Hepatitis(HEV=10, HBV=7, HAV=3)	20	23.5
Intrahepatic Cholestasis of Pregnancy	14	16.4
Acute Fatty Liver of Pregnancy	2	2.3
Hyperemesis Gravidarum	1	1.1

Table 3 shows total maternal mortality is 9 (10.58%) patients out of 85 cases. In Pre-eclampsia out of 28 cases, 1(3.5%) died,whereas in Eclampsia out of 10 cases, 2(20%) died. In HELLP syndrome out of 10 cases, 2(20%) death reported. In viral hepatitis out of 20 cases 3 (15%) death reported, but all 3 cases were due to HEV infection. So, among viral hepatitis, hepatitis E has highest maternal mortality rate when occur in pregnancy. In acute fatty liver of pregnancy out of total 2 cases, 1 (50%) mortality occurred.

Table 3: Distribution of cases according to Maternal Mortality

Liver Disorder	Mortality (n=9)	Percentage	95% Confidence Interval
Pre-eclapmsia (n=28)	1	3.5%	0.09-18.35
Eclampsia (n=10)	2	20%	2.5-55.61
HELLP Syndrome (n=10)	2	20%	2.5-55.61
Viral Hepatitis (n=20)	3	15%	3.21-37.89
Acute Fatty Liver of Pregnancy (n=2)	1	50%	1.26-98.74

Out of total 85 cases, 29 cases (34.12%) had maternal morbidities. Coagulopathy, ARF & ascites were major cause of maternal morbidity in pre-eclampsia, eclampsia, HELLP syndrome and acute fatty liver of pregnancy, Hepatic encephalopathy found in viral hepatitis cases. In the present study 61.1% cases live birth and 38.82% still birth and 9.4%abortion.Out of 61.1% live birth, term were 15.29%, preterm 21.1% and IUGR were 24.70%. Out of 38.82% still birth, fresh still birth 4.7% and macerated still birth were 23.5. Total NICU admission were 22(28.57%).

Table 4:Distribution of cases according to Fetal Outcome

Fetal Outcome	Live Birth(n=52)	Still Birth (n=24)38.82%	
		Fresh(n=4)	Macerated(n=20)
Term	13 (15.29%)	1(1.17%)	3(3.53%)
Preterm	18(21.1%)	2(2.3%)	17(20%)
IUGR	21 (24.70%)	1(1.17%)	
NICU Admission	22 (28.57%)		

Discussion

In present study majority of woman were of younger age group belong to low socio-economic status and unbooked. Similar results are observed in other Indian studies.[6,7,8,9]The incidence rate of liver disorder in pregnancy varies between 0.4% -3.3% in different studies.[7,10,11]In present study the incidence was 0.86% which is consistent with other studies.Most common gestational period was third trimester. In most studies, the cause of abnormal LFT is reported to be pregnancy specific disorders and varies from 67-89%.[12,13].Similarly in our study result is 76.4%out of which 32.9% women had preeclampsia, 11.7% had elcampsiaand 11.7% had HELLP syndrome. ICP occur in 16.4% cases, AFLP cases were 2.3%, hyperemesis gravidarum cases were 1.1%.Viral hepatitis cases were 23.5%, out of which 50% were HEV positive, 35% were HBV positive and 15% were HAV positive cases, so HEV is most common viral hepatitis in pregnancy. Liver disorders have a very peculiar pattern of association with gestational age and most cases in first trimester were of hyperemesis gravidarum. In second trimester, it is often due to the causes that are coincidental and are nonspecific to pregnancy, whereas pregnancy specific causes such as preeclampsia, eclampsia, HELLP syndrome, ICP, AFLP are the etiological factors in third trimester. In present study total abortion cases reported were 9.4%, and out of 62% vaginal delivery.Spontaneous vaginal delivery occurred in 34% cases and Induction of labour required in 28.2% cases for intrauterine death and maternal indication and all of them delivered vaginaly.LSCS was done in 24 cases (28.23%). These findings are consistent with other studies. [9,11]In present study total maternal mortality is 10.58% this finding is consistent with other studies.[14,15]Hepatitis E is found to be cause of highest mortality among all viral hepatitis, when occur in pregnancy. [9,4,15]In present study 34.12% of pregnant women developed complications like coagulopathy, ARF, ascites, pulmonary edema and hepatic encephalotathy. In present study 61.1% were live birth and 28.24% still birth and 9.4% abortion. Out of live birth, term were 15.29%, preterm 21.1% and IUGR were 24.70%. Out of still birth, fresh still birth 4.7% and macerated still birth were 23.53%. Out of fresh still birth, term were 1.17%, preterm 2.3% and IUGR 1.17%. Total term deliveries were 22.08%, total preterm deliveries were 48.05% and total IUGR were28.57%.Total NICU admission were 28.57%. These results are consistent with other studies. [11,9,8,16]

Conclusion

Present study concludes that signs and symptoms of liver disorder in pregnancy are nonspecific, but the underlying disorder can cause significant maternal and perinatal morbidity and/or mortality. Preeclampsia related disorders are the commonest cause of abnormal liver function test particularly in third trimester of pregnancy. Vigilance and awareness in recognizing signs and symptoms of liver disorders in pregnancy like preeclampsia, eclampsia, HELLP syndrome, intrahepatic cholestasis of pregnancy, acute fatty liver of pregnancy, hyperemesis gravidarum and viral hepatitis, followed by correlation with relative values of liver function tests in different liver disorders is essential for diagnosis of liver disorder. Early diagnosis and prompt treatment, with coordinated multidisciplinary team approach is key for the successful management and good maternal and fetal outcome in liver disorders during pregnancy.

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References

1. Khulood T Ahmed, Ashraf A Almashhrawi, Rubayat N Rahman, Ghassan M Hammoud, and Jamal A Ibdah. Liver diseases in pregnancy:Disease unique to pregnancy. 2013; 19(43): 7639-44.
2. SatiaMN, Jandhyala M. A study of fetomaternal outcomes in cases of jaundice at a tertiary care centre. 2016; 5(7):2352-57.
3. Williams Obstetrics (Text Book). Hepatic , Biliary and Pancreatic disorders.Chapt 55, 24th Edition.2014:Pg 1084.
4. Fleming W J. Liver Disease in Pregnancy. Disease Management.2010;5:05-10.
5. Ching LY, Barge N, Dala AR. Study of jaundice in pregnancy in a tertiary care Institute in India. Bombay Hosp J. 2011; 53(2):181-3.
6. Karegoudar D, Patel R D, Dhital M, Amgain K. A study of liver disorder and its consequences in pregnant women with jaundice in tertiary care centre in Belgaum, Karnataka, India. IOSR- JDMS 2014;13(5):14-18.
7. Jayati N, Bajpayi G ,Sharma R. Clinical Study On Jaundice In Pregnancy With Special Emphasis On Fetomaternal Outcome IOSR- JDMS 2015;14(3) :116-119.
8. Krishnamoorthy J, Murugesan A. Jaundice during pregnancy: maternal and fetal outcome. Int. J Repod Contraceps. Obst. Gynecol 2016; 5(8):2541-45.
9. Mishra N, Mishra VN, Thakur P. Study of abnormal live function test during pregnancy in a Tertiary Care hospital in Chhattisgarh. The Jr of Obst&Gyne of India.2016; 6(S1):S129-S135.

10. Acharya N, Acharya S, Samarth S, AthwaleRUtuja, Shveta. Study of Jaundice in Pregnancy. Global Jr. of Medical Research Gynecology and Obstetrics. 2013;XIII(II)Version I.
11. Dsouza AS, Gupta SG. Godwin S. Maternal and fetal outcome in liver diseases of pregnancy – A tertiary hospital experience. Int. Jr of Scientific and Res. 2015;5(9):01-06.
12. Tank PD, Nandanwar YS, Mayadeo NM. Outcome of pregnancy with severe liver disease. Int J Gynecol Obstet. 2002; 76:27–31.
13. Harish K, Nitha R, Harikumar R, et al. Prospective evaluation of abnormal liver function tests in pregnancy. Trop Gastroenterol. 2005;26:188–193.
14. Rein DB, Stevens GA, Theaker J, Wittenborn JS, Wiersma ST. The global burden of hepatitis E virus genotypes. 1 and 2 in 2005. Hepatology 2012; 5(4):988.
15. Rathi U, MiktaB, Pravin R, Abraham. Effect of liver disease on maternal and fetal outcome – A prospective study. Indian Jr of Gastroenterology. 2007;26:60-63.
16. Vemu A, Vani Y J.A study of Etiological factors and fetomaternal outcome in Jaundice Complicating pregnancy at Tertiary Care Centre. IOSR Jr of Dental and Medical Science. 2017;16(11):36-39.

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