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Original Research Article

Evaluation of bile acid and deranged liver function test in obstetrics cholestasis in pregnancy in fetal and perinatal outcome

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ABSTRACT

Background: Pregnancy-related intrahepatic cholestasis is most prevalent hepatic disorder intense pruritus that affects the entire body including palm and sole. It is typically detected during second or third trimester. Pruritus frequently exacerbates at night, marked on the palms and soles of the feet and hands. Aim of this study was to evaluate bile acid and deranged liver function test in obstetrics cholestasis in pregnancy and to determine maternal fetal and outcomes.
Methods: This prospective case series study was conducted in the Department of Obstetrics and Gynaecology, Muzaffarnagar Medical College. The present study was conducted in 50 women, who were selected from outpatient department of antenatal care from tertiary care, taken written permission before study. The medical records of all women with obstetrics cholestasis who delivered between December 2021and August 2022.
Results: Subjects with IHCP has mean age of 30.11±5.03 year, found SGOT 40% in 100-200 and SGPT 44 % I (0-100) range and total bilirubin levels is 33 % in IHCP patients. In study found that LSCS due to 24% in fetal distress, 36% in MSL, 16% in IUGR, 14% preterm. Participants have 22% birth weight <2.5kg and 39 (78%) are under >2.5kg babies in IHCP patients and 24 % were underwent fetal distress and 24 % preterm delivery and 6 % got IUD . and no stillborn and 12% meconium.
Conclusions: It causes maternal pruritus with impaired LFT and raised serum bile acids. Maternal morbidity is increased in terms of increased LSCS rates and discomfort due to pruritus.

Keywords: Intrahepatic cholestasis, Gamma glatmine transferase, Lowe segment caserian, Meconium stained liquor, Serum glutamic pyruvic transaminase and oxaloacetic transaminase

INTRODUCTION

Pregnancy-related intrahepatic cholestasis is the most prevalent hepatic disorder intense pruritus that affects the entire body including the palm and sole. It is reversible disease that leads to sleep deprivation. It is typically detected during 2nd or 3rd trimester.[1] It has high serum aminotransferases and enhanced bile acid levels, the symptoms go away in 48 hours. Mild upper abdominal pain, dark urine and steatorrhea were consistently related to vitamin malabsorption resulted in depletion of vitamin k-dependent clotting factors, increased risk of postpartum haemorrhage. Although maternal invariably increased fetal risk, preterm delivery, low birth weight babies, bradycardia, meconium staining of amniotic fluid, fetal distress, intrauterine death of fetus. Although transaminases, GGT and bile salt levels may be elevated bilirubin levels. It usually involve stillbirth, preterm birth.[2]

Although maternal invariably increased fetal risk , namely preterm delivery, low birth weight babies, bradycardia, meconium staining of amniotic fluid, fetal distress, intrauterine death of fetus.[3] Both spontaneous and iatrogenic MSL, RDS, increased neonatal ICU admission.[4]

In utero and neonatal mortality both occur at an incidence of around 0.5%. The risk of birth defects increases in pregnant women whose bile acid levels are high.[5]

METHODS

This prospective case series study was conducted in the Department of Obstetrics and Gynaecology, Muzaffarnagar Medical College, India. The present observational study was conducted in 50 women, who were selected consecutively from the outpatient department of antenatal care from a tertiary care, taken written permission before commencement of the study. The medical records of all women with Obstetrics cholestasis who delivered between December 2021 and August 2022. From case records the patient profile, complaints, associated medical and obstetric complications were noted.

Inclusion criteria

Inclusion criteria includes women of more than 28-week period of gestation who have altered liver function tests and patients with pruritus.[6]

Exclusion criteria

Exclusion criteria includes in this study is hepatitis serology, hepatobiliary disease and liver autoimmune screen (for primary biliary cirrhosis), presence of skin lesions

The diagnosis of Obstetric cholestasis was made on basis of the symptom of persistent generalized pruritus, biochemical evidence of altered LFTs and the remission of both following delivery. Test to be performed in women is LFT including total bilirubin, SGOT, SGPT, bile acids were used. For the transaminases, gamma glutamyl transferase (GGT) and bilirubin in pregnancy, the upper limit of normal value is 20% lower than that in the non-pregnant state. Alkaline phosphate is raised normally in pregnancy and is considered abnormally high if there is at least 3 fold increase over the normotensive pregnant normal value (upper limit of normal range). Preterm delivery (both spontaneous and iatrogenic), meconium-stained amniotic fluid, respiratory distress syndrome, increased admission to the newborn intensive care unit (NICU), and stillbirth are all important negative outcomes in terms of perinatal outcome. In utero and neonatal mortality both occur at an incidence of around 0.5%. The risk of birth defects increases in pregnant women whose bile acid levels are high.

Participants provided written informed permission before commencement of the study, after approval of the research review board, including 50 pregnant subjects with IHCP (study group) in IHCP and age matched 50 controlled healthy subjects (control group/normal pregnant women) in control.

The information regarding each patient was kept confidential as was not revealed at any point of time. Ursodeoxycholic acid (10-15 mg/kg body weight) was given to patients diagnosed with intrahepatic cholestasis of pregnancy .[7] Fetal complications of IHCP likely to raised fetal serum bile acids taurocholic and taurodeoxycholic acid.[8] Alkaline phosphate (ALP) is raised normally in pregnancy and is considered abnormally high if there is at least 3 fold increase over the normotensive pregnant normal value (upper limit of normal range). All participants were closely monitored on a weekly basis by a clinical staff in an outpatient setting. Women in the research groups were monitored from the beginning of their pregnancies until 3 weeks after delivery.

RESULTS

In IHCP, 33 subjects (66%) were of bilirubin ranging between 33 subjects (66%) 0.2- 0.6 and 2 % (1) in 1-1.4. In control, maximum persons of bilirubin were of bilirubin range 0.2- 0.6 (n=50, 100%), least were in bilirubin1-1.4 and 0.6-1.4 group (Figure 1).

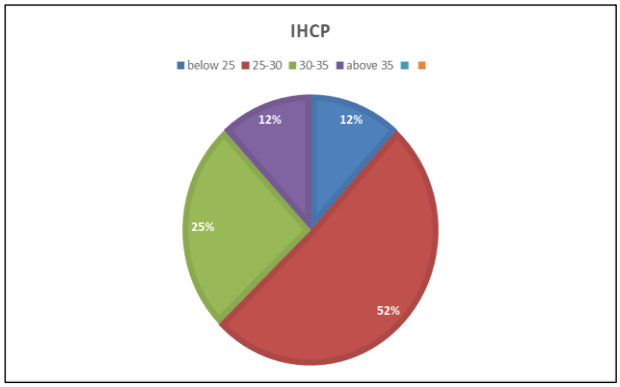

Figure 1: Age distribution of the patient.

Table 1: Biochemical parameter of participants.

Parameters		IHCP = 50		Control (50)	
		N	%	N	%
Bilirubin (mg/dl)	0.2-0.6	33	66	50	100
	0.6-1.0	16	32	0	0
	1-1.4	1	2	0	0
	Total	50			
SGOT (IU/L)	0-100	15	30	44	88
	100-200	20	40	3	6
	200-300	10	20	0	0
	≥300	5	10	3	6
	Total	50			
SGPT (IU/L)	0-100	22	44	49	98
	100-200	17	34	0	0
	200-300	9	18	0	0
	≥300	2	4	1	2
	Total	50			
S.ALP (IU/L)	0-200	8	16	47	94
	200-400	18	36	3	6

Continued.

Parameters		IHCP = 50		Control (50)	
		N	%	N	%
	400-600	19	38	0	0
	≥600	5	10	0	0
		50			
S. bile acid (µMol/L)	≤10	2	4%	40	80
	≥10	48	96%	10	20
		50			

In IHCP, 20 SGOT (40%) were of bilirubin range 100-200 group and least in >300 group (10) patients with SGOT. In control, maximum persons of bilirubin range 100-200 and least were in bilirubin 200-300 range (Table 1).

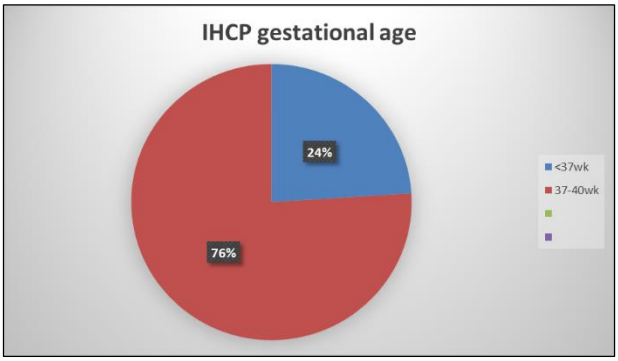

Figure 2: Gestational age comparison for IHCP.

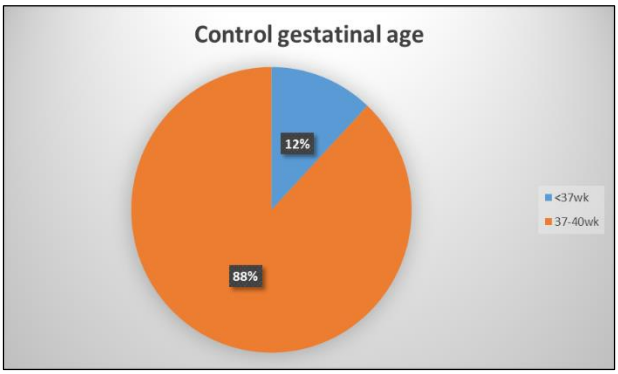

Figure 3: Gestational age comparison in control.

In IHCP, 22 SGPT (44%) were of bilirubin range 0-100 group and least in >300 group 2 (4%) patients with SGOT. In control, maximum persons of bilirubin 49 (98%) in bilirubin 0-100 range least were in bilirubin 100-200, 200-300 range (Figure 2).

In IHCP patients 48 (98%) were of bile acid >10 range and least in <102 (4%) patients. In control, maximum persons of bile acids 40 (80%) in bile acid >10 range, least were in bilirubin <10 range is 10 (20%) (Figure 3).

In IHCP patients were primigravida 40 (80%) and least in multiparous females 7 (14%), 3(6%) patients. In control, maximum in primigravida 26 (52%) and least were in 18 (36%), 6 (12%). In IHCP patients' mode of delivery done vaginally 18 (44%) and LSCS 32 (64%) (Figure 5). In control, maximum delivered vaginally primigravida 28 (56%) and least in lscs 22 (44%). In IHCP patients mother underwent complications 17 (34%) preterm, 18 (24%) fetal distress, 15 (20%) meconium (Figure 4). In control, patients underwent preterm delivery 27 (54%), fetal distress 10 (20%), meconium 9 (12%), 2 (4%) adherent placenta, 1 (2%) abruption (Table 2).

Table 2: Obstetric parameters in participants.

Parameters		IHCP		Control	
		N	%	N	%
Parity	P1	40	80	26	52
	P2	7	14	18	36
	P3	3	6	6	12
	Total	50			
Mode of delivery	Vaginal	18	44	28	56
	LSCS	32	64	22	44
	Total	50			
	Complications	**N**	**%**	**N**	**%**
Compli-cations	Abruption	0	0.0	1	2
	Fetal distress	18	24	10	20
	Adherent placenta	0	0.0	2	4
	Meconium	15	20	9	12
	Preterm delivery	17	34	27	54
	Total	50			

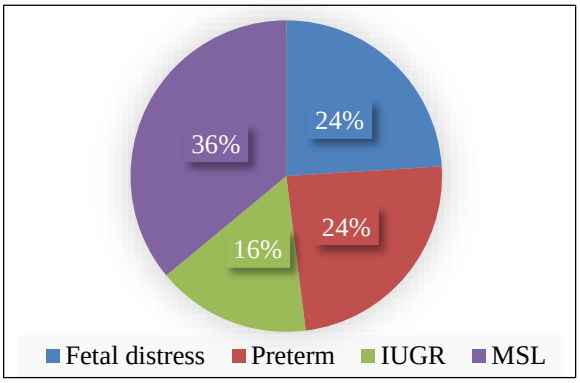

Figure 4: Caeserian indications.

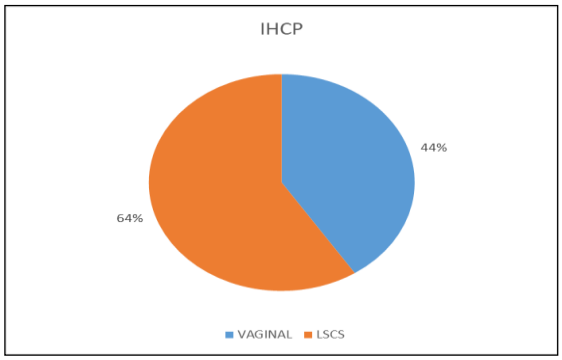

Figure 5: Mode of delivery.

In IHCP patients baby weight 11 (22%) in 1.5-2.5 and least in >3.6 kg 4 (8%). In control, maximum baby weight 40 (80%) in 2.6 -3.5 and least in 1.5 -2.5 kg 3 (6%) (Table 3).

Table 3: Neonatal outcome parameters of participants.

Parameter	Birth weight categories	N	%	N	%
Birth weight (kg)	1.5-2.5	11	22	3	6
	2.6-3.5	35	70	40	80
	≥3.6	4	8	7	14
Birth weight (in kg) (mean±SD)		3.4±0.22		3.09±0.19	
Neonatal outcome					
Parameters	**N**	**%**		**Control**	
				N	**%**
Healthy	17	34		35	70
IUD	6	12		1	2
Preterm	12	24		5	12
Fetal distress	12	24		7	14
Meconium	3	6		1	2
Stillborn	**0**	0		1	2

In IHCP patients neonate underwent complications 17 (34%) healthy, 18 (24%) fetal distress, 15 (20%) meconium. In control, maximum underwent preterm delivery 27 (54%) fetal distress 10 (20%), meconium 9 (12%), 2 (4%) adherent placenta, 1 (2%) abruption (Figure 6).

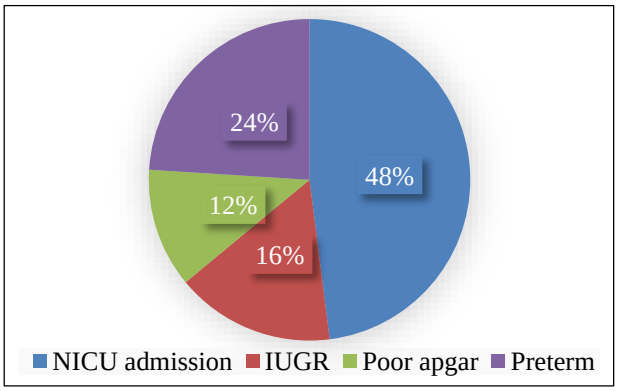

Figure 6: Perinatal outcome.

Chi-square analysis was used to compare the ages of research participants. According to this analysis, the two groups in the research were similar in age. The average symptom onset time 28 weeks. Around 60% individual's first experienced pruritus between 32 and 36 wk. LFT were compared between the two groups on different scales. The ICP group had higher levels of serum AST, ALP, and ALT than the control group. According to current research, the incidence of first-time motherhood was considerably greater among IHCP participants than those in control group. Preterm birth rates were higher in IHCP group than control group, did not achieve statistical significance.

DISCUSSION

This research aimed to evaluate the risk factors for IHCP, the maternal and fetal outcomes related with IHCP bile acid and deranged LFT. The authors enlisted the help of 50 people diagnosed with IHCP and 50 healthy controls.

In this study, there was no significant difference in age distribution in my study as well as Wolfet al, 37.5±2.1.[9] There was a significant elevation of SGOT and SGPT and total bilirubin levels and related to the severity of IHCP (Table 2) similar as like my study that total and direct bilirubin, SGOT and SGPT and alkaline phosphatase abnormally high.

Pregnancy-related variables

Jinhirwal et al study found that the incidence of IHCP was about 62.5% in multigravida and 37.5% in primigravida and there is no significant difference in between two groups.[10]

Despite that Yadav et al found that there is more in primigravida than multigravida and there is no statistical difference in between two groups as like my study.[11]

Perinatal birth outcome

In Vijay et al, 78% comes under >2.5kg as same as my study and 14% patients come under <2.5kg and 22% women who have birth weight <2.5kg in my study.

In this study, 34% of healthy pregnant women and 24% were underwent fetal distress and 24% preterm delivery and 6% got IUD and no stillborn, 12% meconium but Das et al only one stillborn (1.31%).[12] In 2020 study Posh et al there was no stillbirth or IUFD in IHCP, whereas in control, there were one (5.5%) stillbirth and two (11.1%) IUFDs.

Other preg variables

In this study, 36% MSAF, 8% apgar <7, 14 % IUGR, 18% NICU 12% abnormal CTG, and 2021 study Jamwal et al, abnormal CTG was 20%. According to the Vijay [et] al, it is found that CPD (7.8%), previous 2 LSCS (3.1%), non-progress of labor 1 (1.5%), meconium-stained liquor (MSL) (6.2%) but my study shows LSCS due to 24% in fetal distress, 36% in MSL, 16% in IUGR, 14% preterm.

Banotra et al, elective LSCS 59.3% had vaginal delivery. LSCS was done in 60 (40%) patient. 0.7% had instrumental delivery. But in this study, 44% underwent vaginal delivery, 64% underwent LSCS, and 24% underwent preterm delivery. Arthuis et al found emergency and elective LSCS and vaginal delivery was 13.6%, 12.1% and 74.3%. From above studies no statistical difference in between two groups A and control.

In Banotra et al study, meconium stained amniotic fluid in 37 (24.67%), 10% preterm delivery, 2% abruption and 1% adherent placenta whereas in my study found that 18% t fetal distress and 15% meconium, 17% preterm delivery. Kant et al states that 11% preterm delivery, 11% fetal distress, 4% meconium and no abruption.[14] From above studies no statistical difference in between two groups A and control.

In this study it is found that LSCS due to 24% in fetal distress, 36% in MSL, 16% in IUGR, 14% preterm whereas in Vijay et al CPD (7.8%), previous 2 LSCS (3.1%), non-progress of labor 1 (1.5%), MSL (6.2%).

This study has some limitations. The incidence of obstetric cholestasis in our hospital may not be reflective of the incidence in the general population as in my college. Also we did not use steroids in the management of Obs cholestasis in our study, and this management option could be studied.

CONCLUSION

The authors concluded IHCP mom have an increased likelihood of having a premature baby, inducing labor, and undergoing a caesarean section. There is an increase in intrapartum problems, but no rise in postpartum difficulties. The risks to fetus include preterm birth, MSL, fetal distress, and a poorer APGAR score, are increased although not statistically significant. Increases in IHCP linked to increases in T. bilirubin, AST, ALT, and ALP. Both newborns and mothers are at increased risk.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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