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Maternal and fetal outcome in jaundice complicating pregnancy: A prospective study at a tertiary care hospital

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Abstract
Background: The main objective of the study is to evaluate the maternal and fetal outcome in patients with jaundice complicating pregnancy in a tertiary care hospital.
Methods: This is an observational study was conducted in Government Thanjavur Medical College, Thanjavur, Obstetric and gynecologist department, Tamil Nadu, India. All Antenatal women with jaundice complicating pregnancy cases during one year period From August 2016 to July 2017. Different parameters including age, parity, gestational age, booking status, mode of delivery, maternal complications, Perinatal outcome in terms of birth weight, perinatal morbidity and mortality were studied.
Results: Incidence of jaundice in this study was 0.4%, of this 65 women studied 56.9% in the age group of 21- 25 years, mean age is 24 years, 1 case were occurred in >35 years of age which is about 1.53%. The incidence is most commonly involved in primigravidas 61.5% and multigravidas 38.5%. Third trimester is commonly involved in jaundice about 87.6%. 96.9% of the patients studied were booked and 3.1% were unbooked, 92.3% of the patients referred from peripheral hospitals. 32.3% presented with icterus, 46.1% presented with mild paller, pedal edema were reported in 30.7% of cases, most common cause of jaundice in this study was viral infection 43.1%. Most commonly involved virus is hepatitis B virus 89.2%, hepatitis A is 1.53%, hepatitis C 1.53% Of this 55.9% delivered by LSCS and 45.24% delivered vaginally. Atonic pph is the most common complication 10.7%, abruption were reported in 1.5% cases. Term babies were 70.9%, preterm were 24.3%, 50.8% were male and 49.2% were female. Maternal complication rate 24.61%. 8 case of maternal death. Most common cause for death is HELLP syndrome. Live births were 91.5% and 8.5% diagnosed as IUFD.
Conclusion: Jaundice complicating pregnancy is associated with increased maternal mortality and morbidity in developing countries like India and significant role in maternal and fetal outcome. Thus it becomes necessary to create more awareness about the importance of regular antenatal care, health education, early diagnosis and appropriate timely treatment to ameliorate many cases and to bring out a satisfactory maternal and fetal outcome.

Keywords: jaundice complicating pregnancy, maternal outcome and fetal outcome

Introduction

The incidence of jaundice in India varies from 0.4 to 0.9/1000 deliveries. Jaundice in pregnancy carries a grave prognosis for both the mother and the fetus, and is responsible for 10% of maternal deaths. Liver disease in pregnancy is an important medical disorder seen more often in developing countries than in developed ones. which complicates about 3% all pregnancies [1] . The present study analyzes the causes and the feto maternal outcome in pregnancies affected with jaundice. Abnormal liver test results are obtained in 3% to 5% of pregnancies because of many potential causes and the clinical outcomes ranges from self-limiting to rapidly fatal [2,3]. The main causes are:

(1) Pregnancy-related liver disease. (i) Hyperemesis gravidarum (HG) intractable vomiting and nausea during 1 st trimester of pregnancy [4-6]. (ii) Intrahepatic cholestasis of pregnancy (ICP) is multifactorial, involving, genetic, hormonal and exogenous factors [7-10]. (iii) Preeclampsia (iv) Hemolysis elevated liver enzymes, and low platelets (HELLP) [11-13]. (v) Acute fatty liver of pregnancy (AFLP) [14, 15].
(2) Newly acquired liver diseases like acute viral hepatitis, drug induced liver injury, gallstones.
(3) Preexisting chronic liver disease such as cholestatic liver disease, autoimmune hepatitis, Wilson disease, and chronic viral hepatitis.

(4) Physiologic changes in pregnancy - Abnormal liver function test due to physiological changes in pregnancy without liver dysfunction have a unique pattern.

The common maternal complications encountered are Encephalopathy, Disseminated intravascular coagulation, Renal failure, Shock, Postpartum hemorrhage, Pyrexia. Elevated level of serum bilirubin causes vasoconstrictive effect on the placental vessels and cardiotoxic effect resulting in fetal asphyxia and intrauterine death. Elevated bilirubin produces cellular effect which stimulates uterine contractility and sensitizes myometrium to oxytocin resulting in preterm labour. High maternal mortality and morbidity in our country are due to many factors like Poor hygiene, inadequate sanitation, malnutrition, prevalence of anemia, delay in seeking medical advice, lack of awareness and delay in referral to the higher centers. Many patients are brought in moribund condition to the hospital at admission itself and hence they do not respond to treatment.
The prevalence of viral hepatitis in pregnancy can be reduced by creating public awareness, proper sanitation facilities, safe drinking water and immunization against viral hepatitis, improved antenatal care for early detection and well equipped hospitals for intensive care. Thereby, mortality and morbidity of jaundice complicating pregnancy can be decreased.

Materials And Methods

This prospective study done at Government Raja Mirasudar Hospital, Thanjavur from August 2016 to July 2017 were studied. Sixty five women with jaundice complicating pregnancy admitted and treated at Government Raja Mirasudar Hospital, Thanjavur from August 2016 to July 2017 were studied. A detailed history including patient's age, socioeconomic status, booking and details of menstrual history to arrive at the expected date of delivery was obtained. Patients were enquired in detail about their complaints and duration like nausea, vomiting, pruritus, anorexia, yellow coloured urine, pale stools, edema legs, bleeding tendency, joint pain, fever and others.
Past history of jaundice especially in previous pregnancy and history of blood transfusion were elicited. Systemic and obstetric examinations were carried out. Investigations included liver function tests, serum billirubin, SGOT, SGPT, alkaline phosphatase, Viral markers, prothrombin time (PT), partial thromboplastin ime (PTT), bleeding time (BT), clotting time (CT), platelet count and ultrasound abdomen were carried out as and when required. HIV screening was done in all patients. Medical gastroenterologist opinion was obtained for all cases. Labour was closely monitored. Jaundice perse is not an indication for cesarean section. Vaginal delivery with close monitoring was preferred and cesarean sections were done only for obstetric indication. After cross matching fresh blood and ffp was kept ready as alteration in coagulation profile was expected in jaundice complicating pregnancy. Atonicity was managed with oxytocin drip, bimanual compression, Foleys tamponade, injection methergin and injection15 methyl PGF2α, uterine, ovarian artery ligation, internal iliac ligation. Patients were kept in the labour ward. Close monitoring of the patient done in labour ward and icu. Clotting time was repeated hourly if it was prolonged till it becomes normal. Soon after delivery all babies were assessed by paediatrician. Alive weight, apgar score and presence or absence of any congenital anomalies were looked for and noted. As per paediatrician opinion sick babies were admitted in neonatal intensive care unit.
Of the 65 women were studied, 26 patients had viral hepatitis, 2 AFLP, 17 HELLP, 1cholestatic, 10 HELLP with severe pre eclampsia, 1 HELLP with AP eclampsia, 1 HELLP with acute kidney injury, 2 HELLP with viral infection, 3 Hyperemesis gravidarum .The maternal outcome was noted in terms of the mode of delivery, maternal complications and maternal mortality. The relation of maternal morbidity and mortality to the admission serum bilirubin level was analyzed. To identify the various etiologies and distribution of jaundice with reference to age, parity and trimesters. Fetal outcome was assessed by perinatal morbidity and mortality.

Results

In India the incidence of jaundice varies from 0.4 to 0.9/1000 deliveries. According to this study the incidence of jaundice is 4/1000 deliveries. Of the 65 women studied 56.9% were in the age group of 21 to 25 yrs of age (Table: 1). Mean age is 24 years, and it is least common in > 35 years of age. Very much common 87.6% in third trimester followed by first trimester and least common in second trimester of pregnancy (Fig. 1) About 61.5% were primi and 26.2% were Multi gravida (Table: 2). 96.9% of the patients were booked (Table: 3) and 3.1% were unbooked, and 92.3% of the patients referred from peripheral areas, 55.9% delivered by LSCS and 45.24% delivered vaginally (Table: 4).
Most common cause for jaundice is viral hepatitis (43 .1%) (Table: 5) 2 AFLP (3%), 17 HELLP (26.6 %), 1 cholestatic (1.5%), 3 hyperemesis(4.6%),1 haemolytic anaemia (1.5%). Among the 28 viral hepatitis 89.2% was due to hepatitis B, hepatitis C 7.3% and hepatitis A 3.1%, 1 death due to viral hepatitis. Of the delivered 70.9 % were term babies (Table: 6).and 50.8% were male babies and 49.2% were female babies (Fig. 2). 91.5% were live babies (Table: 7) of the 65 women studied 18.5% of the patients were having associated gestational hypertension (Table: 8). 32.3% of the patients had icterus on admission, paller in 46.1%,pedal edema in 30.7%, 1.5% of the patient had reduced urine output on admission (Table: 9). Of the viral hepatitis 86.6% is associated with hepatitis B virus (Table: 10). Atonic pph was the most common complication (Table: 11), 59.5% required blood transfusion (Table: 12) 50 % of the patient died due to HELLP (Table: 13).

Table 1: Age distribution of the subjects in the study population

S. No	Age (in years)	Number (n)	Frequency (%)
1	≤20	7	10.77
2	21-25	37	56.93
3	26-30	15	23.08
4	31-35	5	7.69
5	>35	1	1.53

Table 2: Distribution of the type of parity in the study population

S. No	Type of parity	Number (n)	Frequency (%)
1	Primi	40	61.5
2	Gravida 2	17	26.2
3	Gravida 3	5	7.7
4	Gravida 4	1	1.5
5	Gravida 5	2	3.1

Table 3: Distribution of the booking status and reference status of the patients in the study Population

S. No	Parameter	Number (n)	Percentage (%)
1	**Booking status**		
	Booked	63	96.9
	Not booked	2	3.1
2	**Referal**		
	Referred	60	92.3
	Self	5	7.7

Table 4: Frequency distribution of mode of delivery done in the study population:

S. No	Mode of delivery	Number (n)	Frequency (%)
1	ABD	1	1.6
2	Elective LSCS	2	3.3
3	LSCS	28	47.4
4	Emergency hysterotomy	1	1.6
5	Labour natural with episiotomy	23	38.9
6	RPT LSCS	2	3.6
7	Spontaneous expulsion	1	1.6
8	Vacuum	1	1.6

Table 5: Frequency distribution of diagnosis done in the study population:

S. No	Type of diagnosis	Number (n)	Frequency (%)
1	AFLP	2	3.1
2	HELLP	17	26.2
3	HELLP with AKI	1	1.53
4	HELLP with eclampsia	1	1.53
5	HELLP with SPE	5	7.7
6	HELLP with viral infection	2	3.1
7	HG	2	3.1
8	HG with wernicks	1	1.53
9	Hemolytic anemia	1	1.53
10	Intrahepatic cholestatis	1	1.53
11	Partial HELLP	1	1.53
12	Viral infection	26	40
13	No definitive diagnosis attained	5	7.7

Table 6: Maturity of Baby

Maturity of Baby	Total Percentage	Total Percentage
Preterm	15	24.3
Term	44	70.9
Abortus	3	4.8
Total	62	100

Table 7: Fetal outcome

Fetal Outcome	Total	Percentage
Born Alive	54	91.5
Death(Iud+Perinatal)	5	8.5

Table 8: Distribution of frequencies of associated medical disorders in the study population

S. No	Type of the associated medical disorders	Number (n)	Frequency (%)
1	No associated disorders	39	60
2	Acute kidney injury	1	1.5
3	Gestational diabetes mellitus	2	3.1
4	Gestational diabetes mellitus with gestational hypertension	2	3.1
5	Gestational hypertension	12	18.5
6	Gestational hypertension with severe anemia	3	4.6
7	Hypothyroidism	4	6.2
8	Nephrotic syndrome	1	1.5
9	Splenomegaly	4	1.5

Table 9: Distribution of various clinical symptoms in the study population

S. No	Parameter	Number (n)	Percentage (%)
1	Icterus		
	Absent	43	66.15
	Present (+)	21	32.3
	Present (+++)	1	1.53
2	Pallor		
	Absent	34	52.3
	Present (+)	30	46.1
	Present (++)	1	1.53
3	Pedal edema		
	Absent	35	53.8
	Present (+)	20	30.7
	Present (++)	10	15.38
4	Urine output		
	Normal	47	72.3
	Decreased (↓)	11	16.92
	Decreased (↓↓)	1	1.53
	Decreased (↓↓↓)	1	1.53
	Nil	5	7.69

Table 10: Distribution of viral markers in the study population

S. No	Type of viral markers	Number (n)	Frequency (%)
1	Negative	37	56.9
2	HAV positive	1	1.53
3	HBs AG positive	26	38.46
4	HCV positive	1	1.53

Table 11: Maternal complications observed in the study population

S. No	Type of the complication	Number (n)	Frequency (%)
1	Abruption	1	1.5
2	Aki	1	1.5
3	Atonic	8	10.7
4	Divc /Hellp	2	3.0
5	Hep.Enc	4	6
6	Nil	51	77.3

Table 12: Blood Transfusions

S. No	Number of patients	Number of packed cell	Frequency (%)
1	27	Nil	41.54
2	13	1	20.0
3	6	2	9.3
4	7	3	10.77
5	9	4	13.8
6	3	>4	4.62

Table 13: Cause of Death

Cause of Death	Numbers	Percentage
Hellp	4	50
Aflp	2	25
Viral	1	12.5
Aki	1	12.5

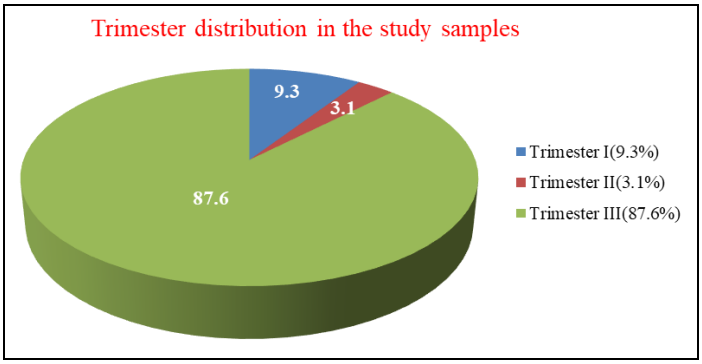

Fig 1: Trimester distribution of the subjects In the study sample

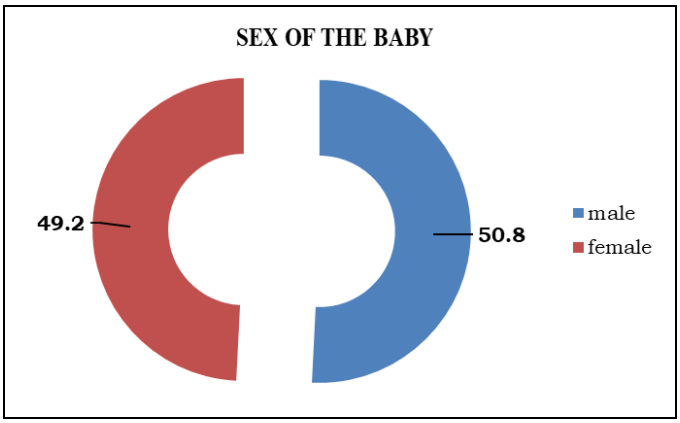

Fig 2: Sex of The Baby

Discussion

This is a prospective study done at Government Raja Mirasudar Hospital, Thanjavur from August 2016 to July 2017 were studied. Sixty five women with jaundice complicating pregnancy admitted and treated at Government Raja Mirasudar Hospital, Thanjavur from August 2016 to July 2017 were studied.

Hepatic disorder of pregnancy present as an benign disease with abnormal elevation of liver enzyme levels and a good outcome or it can manifest as an serious entity affecting hepatobiliary function resulting in hepatic failure and death of the mother and the baby. There is no specific clinical markers that predict the course of the pregnancy and the pathophysiologic mechanisms are not always understood. The overall mortality attributed to hepatic disorder in pregnancy has been dramatically reduced in the past few decades because of clinicians understanding of the physiologic changes that occurred during pregnancy, early identification of the etiology and its effective management in a timely manner. A coordinated team approach that involves the primary care physician, obstetrician, gasteroenterologist, is often required to promote good maternal and fetal outcome.

The incidence of jaundice in India varies from 0.4 to 0.9 %. According to 0ur study incidence is 0.4%, which is similar with Kamalajayaram and Rama Devi *et al* [16] reported 0.4/1000 incidence, Singh *et al* [17] reported the incidence of 1.03%.

Liver disorder most of the patients were in the age group of 21-25 years young age groups are most commonly affected than older age group, which is comparable with Swati *et al* [18]. The study done by Meena *et al* [19] most of the patients were in the age group of 25-29 yrs and the study done by Brijesh *et al* [20] most of the patients were in the age group of 20-24 years. In the study done by Pranithi mitta *et al* [21], most of the patients were in the age group of 21-25 years of age

In our study, 61.50% of the affected patients were primiparas which is similar with the study done by Meena *et al* [19], 49% were primiparas. In the study done by Swati *et al* [18], 66.6% were primiparas and the study done by Pranithi mitta *et al*, 61.9% were multiparas

In the studied population most of the patients were booked only 3.1% were unbooked. In the study done by Swati *et al* [18]. 93.3% were unbooked. In the study done by Brijesh *et al* [20], 66% were unbooked. Viral hepatitis is the commonest cause of jaundice in our study is similar with all the studies done by Meena, Brijesh and Krishnamoorthy [18, 20, 22].

In our study the incidence of hepatic encephalopathy was 6.1%. In the study done by meena *et al* [19] the incidence was 20%, in Swati *et al* [18] the incidence of hepatic encephalopathy was 3.3%, in Brijesh *et al* [20] the incidence of hepatic encephalopathy was 18.3%.the incidence of hepatic encephalopathy was very high in our study. On comparing with other studies the incidence of PPH is comparable with Krishnamoorthy *et al* [22] (22%).

In our study the fetal maturity is 70.9% which is equal with study done by Swati and Pranithi mitta *et al* [18, 21]. Majority of babies were born at term. In other studies by Meena and Brijesh *et al* [19, 20], majority of babies were born as preterm babies.

Conclusion

Jaundice in pregnancy is associated with high maternal mortality and perinatal mortality viral hepatitis is the leading cause of jaundice according to our study with hepatitis B being the predominant virus. Hepatic encephalopathy and acute kidney injury are the two important maternal complications. HELLP is the common cause of death. Patients admitted with initial bilirubin level of > 10 are associated with very poor maternal outcome and high maternal mortality.

The factors responsible for a high maternal mortality in our country may be delay in seeking medical advice, poor nutrition hygiene, prevalence of anemia, early marriage and delay in referral to the hospital. Many of the patients when brought to the tertiary health care system are already in moribund condition and often, do not respond to treatment. Early antenatal care,

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