Mean Gestational Age at Delivery in Females Presenting with Intrahepatic Cholestasis

Shazia Rasul,[1] Maimuna Unbreen,[2] Sana Fatima,[3] Shabnam Tahir[4]

Abstract

Objective: To determine the mean gestational age at the time of delivery with intrahepatic cholestasis presenting in active labor for delivery in females at Shalamar Hospital Lahore.

Method: It was the cross sectional study that was conducted at Obs. & Gynae department, Shalamar Hospital Lahore with time span of 06 months. Sample Size of 140 women included in study subsequently fulfilling the inclusion criteria and all the women delivered by researcher by herself. Gestational age was noted and data analysis was done at SPSS version 17.0. Stratified groups compared by using independent sample t-test.

Results: The average maternal age at delivery time was 27.7±6.3 with a range of 18 to 40 years. Mean gestational age was 37.8±1.2 weeks. There were 84 patients (60%) were between para 0 -2 and 56 patients (40%) were between para 3-4. Mean BMI was 30.6±3.0 kg/m2. Stratification with respect to age, BMI and parity was also carried out.

Conclusion: In conclusion, in this cross- sectional study of intrahepatic cholestasis of pregnancy patients, mean gestational age at delivery was found to be 37.8±1.2 which revealed that ICP is not a risk factor for pre-term delivery.

Keywords: Intrahepatic cholestasis, Mean gestational age, Active labour.

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Introduction

Intrahepatic cholestasis during pregnancy (ICP), is a liver disorder occurred particularly during pregnancy. It is characterized as maternal pruritus during 3rd trimester, elevated bile acids in blood and higher rates of adverse pregnancy outcomes. It has significant fetal consequences.[1-3] Bile acid helps in excretion, absorption, and transport of sterol and fats in the gut & Liver. Primary bile acid, cholic acid and chenodeoxy cholic acid are structurally similar expect for one hydroxyl group at position seven. They are formed from cholesterol in the hepatocyte. Because of the toxic nature of bile acids their concentration is tightly regulated by hepatocyte. In ICP there is imbalance between secretion and excretion of bile acid within the liver.

There are many other diseases or conditions that can cause cholestasis like primary billary cirrhosis, primary sclerosing cholangitis, sepsis, viral infections like EBV, CMV, Herpes, certain drugs and alcohol. ICP is more prevalent in south Asian (0.8-1.46) % and South American (9.2-15.6) % Population. The cause of ICP comprises of genomic and ecological aspects. There are certain risk factors those increase the risk of ICP like advanced maternal age more than 35 years, multiparity, multiple pregnancy, previous history of ICP, history of use of oral contraceptive pills. The recurrence rate is about 40-60 percent. Increase in bile acids levels in blood of both; mother and her fetus, is the main element of pathophysiology, initiate itching to mother and high obstetrics complications also including mortality. Raised levels of bile acids in blood of pregnant

1,4. Shalamar Medical & Dental College, Lahore
2. Sahiwal Teaching Hospital, Sahiwal, Pakistan
3. THQ Hospital Kotmomin, Sarghoda

Correspondence:
Shazia Rasul: *Department of Obs. & Gynae Shalamar Hospital Lahore, Pakistan. Email: drshaz786@hotmail.com*

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female are indicative of ICP.[4] ICP can cause higher risk of preterm delivery (19-60%), meconium staining (27%), bradycardia to fetus (14%), fetal respiratory distress (22-41%), and pregnancy loss including fetal death (0.4-4.1%), especially in cases with the raised bile acid levels >40µmol/L.[5] Although exact mechanism of poor fetal outcome is not clarified yet but increase flow of bile acid from mother to fetus and reduced capacity of fetal liver to eliminate excess of bile acid is the main mechanism which leads to excessive accumulation of bile acids in fetal body effecting many organs mainly causing cardio toxicity, arrhythmia and sudden death. Accumulation of bile acid in umbilical cord can cause vasoconstriction leading to meconium staining. Increase bile acid can cause myometrial contraction by increasing oxytocin bio activity and increase release of prostaglandins. Various medications like antihistamine are used but they can only relive symptoms but not decrease the bile acid level. A naturally occurring hydrophilic bile acid known as ursodeoxycholic acid helps in deceasing bile acid level. The gestational age of females having Intrahepatic Cholestasis of Pregnancy, at the time of delivery, differs. One study showed that the average gestational age at delivery among females having ICP was 37.5±1.6 weeks.[3]One more study-also showed that the average gestational age on time of delivery in females with ICP was 37±1.2weeks.[1] but one study reported that the mean gestational age at time of delivery in females with ICP was 33.1±3.78 weeks.[6] The basic purpose of this research and study is to evaluate the mean gestational age on time of delivery in females with ICP presenting in active labor for delivery. Literature is evident that the pregnant females with ICP usually deliver after term (>37weeks). But controversial evidence has been found in literature. So, through this study was aimed to confirm that whether these females deliver at term or at preterm weeks. Because the complications of ICP as well as impact of preterm delivery is very significant for neonate especially in our part of world where the neonatal care unit services are compromised. So, obstetricians need some intervention to prevent the preterm deliveries and its consquences. But first we need to know the gestational age at time of delivery in ICP cases. This study will help us to improve our practice and update guidelines to plan strategies to reduce the burden of ICP and its associated complications.

Materials and Methods

Study Design was Cross Sectional and settings was Department of Obs. & Gynae Shalimar Hospital Lahore. Duration was six months and sample size was Sample size consisted of 140 cases was calculated by 95% confidence level, d=0.80 and taking magnitude of mean gestational age at delivery i.e. 37.5±1.6 weeks in females with ICP presenting for delivery. (n=140), sample Technique was Consecutive sampling, Non- probability. Sample selection was in sample selection below discussed criteria is used. Inclusion criteria was patients presenting with ICP as evidenced by symptom of pruritis, deranged (AST>40IU, ALT > 40IU and raised bile acids >10umol/L in active labor with age range 18-40 years with parity <5[1-3]. Exclusion criteria was multiple pregnancy (on ultrasound) Previous cesarean delivery (on history). Females with systemic problems i.e. Hypertension (HTN), (Blood Pressure >140/90mmHg), Diabetes Mellitus (Blood Sugar Random (BSR)>186mg/dl), renal problem (creatinine>1.2mg/dI), anemia (Hb<10g/d1) or liver disease before and during conception of pregnancy (AST>40IU, ALT)-401U), viral hepatitis and fatty liver. Study Tool: Data/information was gathered by filling the Performa. Subsequently obtaining approval from ethical committee of hospital 140 cases satisfying selection criteria were selected from labour room of Obs. and Gynae Department, Shalamar Hospital Lahore. Informed consent was also taken from the patients. Demographic information (name, Parity, age, and BMI) was also noted. All women were delivered by researcher herself. Gestational age was noted. Patient's distribution data is given below in the **Table-1**

Data analysis: data were entered and examined in SPSS version. Quantitative data like BMI, age and gestational age was given as standard deviation and mean. Parity was given in frequency and percentage. Stratification of data was done against age, BMI and Parity. Stratified groups compared by using independent sample t-test. P value ≤0.05 were observed significant.

Table 1: *Patients data summary.*

Distribution of Patients	Mean	Total No of Patients=140	Percentage
Age	18-30	97	69.3
	31-40	43	30.7
Gestational Age (week)	< 37	23	16.4
	≥ 37	117	83.6
Para	0-2	84	60.0
	3-4	56	40.0
BMI (kg/m2)	<25	3	02.1
	>25	137	97.9
Jaundice		21	15
Pruritus		126	90.0

Table 2: *Patients Lab test investigation*

Liver Function Test	Reference Range	Mean	Standard Deviation
ALT (U/L)	1-30	115	25
AST (U/L)	1-21	88	23
Total Billi Rubin (mg/dl)	0.22-1.2	3.5	1.8
Bile Acid (µmol/L)	6-7	30	4.5

Results

Total 140 females were taken in this study during the period of 06 months. The average maternal age at time of delivery was 27.7±6.3 with a range of 18 to 40 years. Mean gestational age was 37.6±1.2 weeks. There were 84 patients (60%) were between para 0-2 and 56 patients (40%) were between para 3-4. Mean BMI was 30.6±3.0 kg/m2. Stratification was carried out according to age, BMI and parity.

Table 3: *Stratification for age*

Age	Gestational Age (week)	
	Mean	Standard deviation
18-30	37.69	1.27
31-40	37.64	1.34
t value	0.208	
p value	P = 0.835	

Table 4: *Stratification for parity*

Para	Gestational Age (week)	
	Mean	Standard deviation
0-2	37.67	1.30
3-4	37.68	1.28
t value	- 0.027	
p value	P = 0.979	

Table 6: *Stratification for BMI*

BMI (kg/m^2)	Gestational Age (week)	
	Mean	Standard deviation
⩽25	38.33	1.15
> 25	37.66	1.29
t value	0.625	
p value	P = 0.533	

Discussion

ICP (Intrahepatic cholestasis of pregnancy) probably affects about 1% pregnancies. In worldwide ICP is considered as the most common intrahepatic cholestatic condition.[20] During Pregnancy the respective liver capacity to metabolize pregnancy-related steroids is the most considerable contributing factors. The exact and precise etiology has still remained unidentified. It is usually seen that ICP occurs in families that suggested its genetic susceptibility. This effect also raised an interest in molecular genetic cause of ICP. ICP usually benign to mother but there are certain risk to fetus including increased risk of meconium staining, pre term delivery, fetal distress and intrauterine fetal demise. Patient with ICP in previous pregnancy should have extra surveillance in pregnancy which will reduce 80% of complications related to ICP in current pregnancy in case of recurrence. In a study by Rook et al (1) found that 33% of cases has complications related to ICP like RDS, Meconium staining, fetal distress but there was no case of intrauterine fetal demise. One other study reported 24% compilation related to ICP.[21] RDS was observed 52% of the complication which shows that RDS incidence in neonates born to ICP mother is twice of the normal population. This may be due to delivery at earlier gestation but it has been hypothesized that bile acid can cause depletion of surfactant in the alveoli. The mean gestational age in patients with history of ICP was 37 (Range 36-39) and in those without ICP was also 37 (Range 33-40). The proportion of deliveries with gestational age more than 37 weeks was 35% in patient with history of ICP and 26% in patient without ICP. In present study, mean gestational age was found to be 37.6±1.2 weeks which is comparable with the study of Rook et al (37.0±1.2) and Geenes et al (37.5±1.6.)

Conclusion

In conclusion, in this cross-sectional study of

intrahepatic cholestasis of pregnancy patients, mean gestational age at delivery was found to be 37.6±1.2 which revealed that ICP is not a risk factor for pre-term delivery.

Conflict of Interest: *None*

Funding Source: *None*

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Authors Contribution

SR, MU, SF, ST: Conception of study, Experimentation/Study con-duction, data collection, Analysis, Discussion, Manu-script Writing RS: Critical Review Facilitation and Material Analysis Literature search, conceptualization of the study, Interpretation, Proof study and review.