Pakistan Journal of Intensive Care Medicine
eISSN: 2708-2261; pISSN: 2958-4728
www.pjicm.com
DOI: https://doi.org/10.54112/pjicm.v5i02.205
*Pak. J. Inten. Care Med., volume 5(2), **2025**: 205*
Original Research Article

OBSTETRIC CHOLESTASIS IN PREGNANCY: EVALUATING FETOMATERNAL OUTCOMES

IFTIKHAR A[1], RAEES M[*2], YOUSAF S[3]

[1]*Department of Obstetrics & Gynaecology, Qazi Hussain Ahmed Medical Complex, Nowshera, Pakistan*
[2]*Department of Obstetrics & Gynaecology, Lady Reading Hospital, Peshawar, Pakistan*
[3]*Department of Obstetrics & Gynaecology, Khyber Teaching Hospital, Peshawar, Pakistan*
**Corresponding author email address:* mahnazraees@yahoo.com

(Received, 05th September 2025, Revised18th November 2025, Accepted 02nd December 2025, Published 6th December 2025)

ABSTRACT

Background: *Obstetric cholestasis is a pregnancy-specific liver disorder characterized by pruritus and elevated serum bile acids. It is associated with significant maternal and fetal risks, including preterm birth, fetal distress, and increased cesarean delivery rates. Early identification is essential to reduce complications and improve outcomes.* ***Objective:*** *To evaluate fetomaternal outcomes among pregnant women diagnosed with obstetric cholestasis.* ***Study Design:*** *Descriptive cross-sectional study.* ***Setting:*** *Conducted at a tertiary care obstetrics unit.* ***Duration of Study:*** *From October 2024 to August 2025.* ***Methods:*** *A total of 118 pregnant women with obstetric cholestasis were included. Diagnosis was confirmed by pruritus and serum total bile acids >10 µmol/L. Maternal outcomes assessed included emergency cesarean section, postpartum hemorrhage, and gestational diabetes. Neonatal outcomes included meconium-stained liquor, preterm delivery, low birth weight, low Apgar scores, and NICU admission. Data were analyzed using SPSS version 25, and results were presented as frequencies, percentages, and means.* ***Results:*** *The mean maternal age was 26.86 ± 7.03 years. Emergency cesarean section occurred in 36.4% (n = 43). Postpartum hemorrhage was observed in 10.2% (n = 12), and gestational diabetes in 11.9% (n = 14). Among neonatal outcomes, meconium-stained liquor was present in 36.4% (n = 43), preterm delivery in 27.1% (n = 32), and low birth weight in 28.0% (n = 33). Low Apgar scores were recorded in 7.6% (n = 9), and 22.0% (n = 26) required admission to the NICU.* ***Conclusion:*** *Obstetric cholestasis was associated with an increased risk of adverse maternal and fetal outcomes. Early diagnosis, close monitoring, and timely intervention are essential to reduce complications and improve perinatal outcomes.*

Keywords: Obstetric Cholestasis, Intrahepatic Cholestasis of Pregnancy, Fetomaternal Outcomes, Emergency Caesarean Section, Meconium-Stained Liquor, Preterm Birth, Neonatal Intensive Care Unit

INTRODUCTION

Obstetric cholestasis, also known as intrahepatic cholestasis of pregnancy, is a specific hepatobiliary complaint characterized by maternal pruritus and biochemical abnormalities, including elevated serum bile acids and liver enzymes, typically arising in the late second trimester and normally resolving following delivery. Despite resolution of maternal indications postpartum, there is cumulative recognition that intrahepatic cholestasis of pregnancy carries substantial risks for the mother as well as the fetus. An investigation demonstrated that intrahepatic cholestasis is significantly related to adverse perinatal outcomes, including preterm birth, meconium-stained amniotic fluid, and small for gestational age infants. Another study confirmed dose-response relationships between bile acid levels and risks, as well as preterm labour, neonatal respiratory complications, and perinatal demise (1-4).

Although global evidence underscores these risks, data from Pakistan remain comparatively sparse but alarming. A study reviewed pregnant women complicated by cholestasis and reported incidence of meconium-stained liquor 19.5%, preterm labor 3.65% and NICU admission 17% highlighting considerable perinatal morbidity in this setting. These findings are consistent with reports from other areas presenting higher rates of C-section, fetal distress, and NICU admissions in ICP pregnancies compared to unaffected pregnancies (3-7). Another study documented increased NICU admissions and meconium-staining among ICP cases compared to controls (8). A recent study performed in Pakistan highlighted the heterogeneity in ICP management and the need for early diagnosis, bile acid monitoring, and standardized delivery protocols to minimize adverse outcomes (9).

Understanding the occurrence and spectrum of adverse maternal outcomes will help to inform local obstetric protocols, optimize timing of delivery and neonatal care, and contribute to reducing perinatal morbidity and mortality. The present study aims to systematically evaluate maternal outcomes in pregnant women diagnosed with obstetric cholestasis, providing updated regionally relevant evidence to guide clinical management and improve perinatal care in pregnancies complicated by ICP.

METHODOLOGY

This cross-sectional study was conducted at Obstetrics and Gynaecology Department of Tertiary Care Hospital from October 2024 to August 2025. The study enrolled 118 pregnant women, aged 18 to 40 years, with gestational age > 30 weeks, who were diagnosed with obstetric cholestasis. The diagnosis was confirmed when the patient reported dark urine, loss of appetite, and intense itching (pruritus) affecting the hands and feet. Further diagnosis was made by conducting a blood test, i.e., total serum bile acid levels > 11-µmol/L/L. Data regarding maternal demographics and pregnancy details were collected systematically.

All patients were followed until delivery. The study evaluated fetomaternal outcomes. Maternal outcomes were defined as the necessity for an emergency caesarean section, the incidence of postpartum haemorrhage, and the diagnosis of gestational diabetes. Fetal and neonatal outcomes were the presence of meconium-stained amniotic fluid at delivery, preterm birth before 37 completed weeks

[Citation: Iftikhar, A., Raees, M., Yousaf, S. (2025). Obstetric cholestasis in pregnancy: evaluating fetomaternal outcomes. *Pak. J. Inten. Care Med. 5(2), **2025**: 205*. doi: https://doi.org/10.54112/pjicm.v5i02.205]

of gestation, a low birth weight of less than 2500 grams, an Apgar score of less than 7 at five minutes, and admission to the neonatal intensive care unit. The entire assessment was performed under the supervision of a consultant.

All the data were analyzed with SPSS 25. Descriptive statistics were used to present the data. Age, gestational age, and BMI were calculated using means and standard deviations. Frequency and percentages were used for demographics, parity, and fetomaternal outcomes. 95% CI were calculated for the fetomaternal outcomes.

RESULTS

One hundred eighteen women were included in the study; their average maternal age was 26.86 ± 7.03 years (Table I).

Regarding demographic distribution, a slight majority of patients were primigravidas, 64 women (54.2%), with 54 (45.8%) multigravidas (Figure 1). Most women belonged to the middle socioeconomic stratum (63, 53.4%), while 33 (28.0%) were from a low-income background and 22 (18.6%) from a high-income background. A majority of the study population, 68 women (57.6%), resided in rural areas, while the remaining 50 (42.4%) were living in urban settings.

Analysis of maternal outcomes revealed that 43 women (36.4%) required an emergency caesarean section. Postpartum haemorrhage was observed in 12 cases (10.2%). Gestational diabetes was present in 14 women (11.9%). Concerning fetal and neonatal outcomes, meconium-stained liquor was a frequent finding in 43 deliveries (36.4%). Preterm delivery occurred in 32 cases (27.1%). Thirty-three neonates (28.0%) had a low birth weight. A low APGAR score was observed in 9 cases (7.6%). NICU admissions were 26 (22.0%) (Table 3).

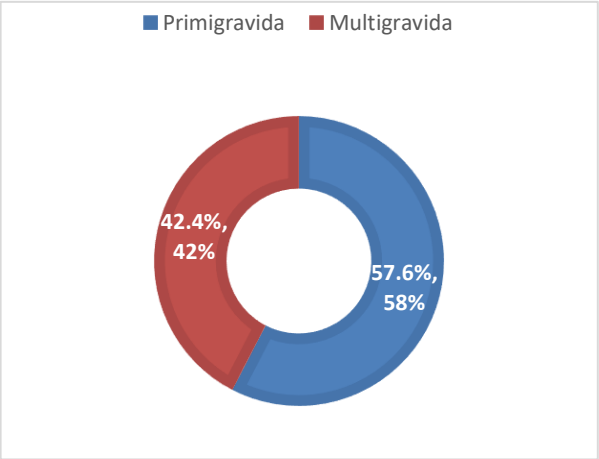

Figure 1: Parity distribution of the patients

Table 1: Demographics of the patients

Mean			**Std. Deviation**
Age (Years)		26.86	7.025
BMI (Kg/m^2)		28.0679	1.69146
Gestational age (Week)		38.03	3.076
n			**%**
SES	Low	33	28.0%
	Middle	63	53.4%
	High	22	18.6%
Residence	Rural	68	57.6%
	Urban	50	42.4%

Table 2: Fetomaternal outcomes

Fetomaternal outcomes		**n**	**%**	**95% CI**	
				Lower	**Upper**
Emergency CS	Yes	43	36.4%	0.27	0.45
	No	75	63.6%		
PPH	Yes	12	10.2%	0.05	0.17
	No	106	89.8%		
Gestational diabetes	Yes	14	11.9%	0.06	0.19
	No	104	88.1%		
Meconium-stained liquor	Yes	43	36.4%	0.27	0.45
	No	75	63.6%		
Preterm delivery	Yes	32	27.1%	0.19	0.36
	No	86	72.9%		
Low birth weight	Yes	33	28.0%	0.20	0.37
	No	85	72.0%		
Low APGAR (< 7 at 5 mins)	Yes	9	7.6%	0.03	0.14
	No	109	92.4%		
NICU admission	Yes	26	22.0%	0.14	0.30
	No	92	78.0%		

DISCUSSION

The findings of this study offer a valuable perspective on the profile and outcomes of obstetric cholestasis in our local setting. The demographic profile of the present cohort aligns well with the characteristics repeatedly described in other studies. The mean maternal age of 26.86 years is similar to the ages reported by Nasir et al. (26.42 years) and Madhu et al. (27.15 years) (10, 11). This finding was also consistent with the work of Rehman et al. and Upreti et al (8, 12).

In this study, 54.2% patients were primigravida. Nasir et al. reported a higher rate of primigravida, 64.1% while Madhu et al. and Singh et al. and documented rates of 45.81% and 43.8% respectively (10, 11, 13). This collective evidence suggests that while the condition frequently manifests in a first pregnancy, it also substantially affects multiparous women. A notable finding in this study is the mean BMI of 28.07 kg/m², which categorises the cohort as predominantly overweight. This corroborates the findings of Nasir et al., in which 42.3% of participants had a BMI between 25 and 29 kg/m², and supports the growing association between obesity and the development of obstetric cholestasis, a link also explored by Valdovinos-Bello et al. (10, 14). Furthermore, the socioeconomic and residential data revealed that the majority of the cohort were from middle-income (53.4%) and rural (57.6%) backgrounds. This finding is consistent with demographic trends reported in various studies, potentially reflecting healthcare access patterns (8, 11).

[Citation: Iftikhar, A., Raees, M., Yousaf, S. (2025). Obstetric cholestasis in pregnancy: evaluating fetomaternal outcomes. *Pak. J. Inten. Care Med. 5(2), **2025**: 205*. doi: https://doi.org/10.54112/pjicm.v5i02.205]

The analysis of maternal outcomes showed that the rate of emergency caesarean section in this study was 36.4%. This figure is very similar to the 35.0% reported by Rehman et al. and the 33% found by Upreti et al (8, 12). This finding was slightly lower than the 38.46% documented by Nasir et al (10). This consistency underscores the high risk of intrapartum intervention, often attributed to fetal distress precipitated by the condition. The incidence of postpartum haemorrhage was 10.2%. This finding is consistent with the rates of 8.97% reported by Nasir et al. and 8.87% by Madhu et al., but appears higher than the 2.7% observed by Upreti et al. (10-12). This variation could be influenced by differing management protocols, particularly concerning vitamin K supplementation to counteract potential coagulopathies related to fat malabsorption. The prevalence of gestational diabetes mellitus was 11.9%. This aligns with the association between obstetric cholestasis and metabolic dysfunction, a connection noted by various studies (12, 15).

The fetal and neonatal outcomes observed in this study further validate the recognised risks associated with obstetric cholestasis. The rate of meconium-stained liquor was 36.4%. This is a typical complication of the condition, and the finding is highly consistent with 35.8% by Rehman et al. and 38.4% reported by Nasir et al (8, 10). The preterm delivery rate of 27.1% is also a common and serious complication. This figure is very close to the 28.5% reported by Madhu et al. and the 26.1% by Upreti et al (11, 12). Correspondingly, the low-birth-weight rate of 28.0% is similar to the 26.92% reported by Nasir et al. and the 28.8% reported by Upreti et al., often a direct result of preterm delivery (10, 12).

The proportion of newborns with a low APGAR score at five minutes was 7.6%. This is comparable to the 7.2% reported by Upreti and the 8.5% documented by Mukhopadhyay et al., indicating a consistent risk of neonatal depression at birth (12, 16). Furthermore, the NICU admission rate of 22.0% is almost identical to the 23.3% by Rehman et al. and 20.9% found by Upreti et al.[8,12] This recurring finding highlights the significant neonatal morbidity associated with obstetric cholestasis, often due to complications of prematurity, respiratory distress, or birth asphyxia. A critical aspect of modern research on this condition, strongly emphasised by Sridhar et al., is the correlation between the severity of biochemical abnormality and the risk of adverse outcomes (17).

This study had several limitations. Its single-centre design might have limited the generalisability of the findings to other settings with different patient demographics or clinical practices. The absence of stratification based on serum bile acid levels prevents a deeper analysis of how disease severity influenced the observed outcomes. A longitudinal follow-up of the neonates was not conducted, leaving the long-term developmental impact unexplored.

CONCLUSION

This study demonstrated that obstetric cholestasis increases the risk of adverse fetal and maternal outcomes. These results underscore the critical need to monitor and actively manage affected pregnancies to mitigate these well-defined risks.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Consent for publication

Approved

Funding

Not applicable

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

AILA IFTIKHAR (Postgraduate Resident)
Data entry, data analysis, and drafting an article.
Conception of Study, Final approval of manuscript.
MAHNAZ RAEES (Associate Professor)
Conception of Study, Manuscript drafting, Development of Research Methodology Design, Study Design, Critical Guidance, Review of manuscript, and final approval of manuscript
SUMAYYA YOUSAF (Postgraduate Resident)
Critical input and Review of Literature.

REFERENCES

1. Chaudhary S, Anjum HH, Khan MU, Khurram A, Nazim U, Maqsood Dar M. A systematic review on complications of intrahepatic cholestasis of pregnancy. Pak J Med Health Sci. 2022;16(10):894-9. https://doi.org/10.53350/pjmhs221610894
2. Odutola PO, Olorunyomi PO, Olatawura OO, Olorunyomi I, Madojutimi O, Fatunsin AO, et al. Intrahepatic cholestasis of pregnancy is associated with increased risk of hepatobiliary disease and adverse fetal outcomes: a systematic review and meta-analysis. iLiver. 2023;2(4):219-26. https://doi.org/10.1016/j.iliver.2023.11.001
3. Mazhar T, Niaz H, Bukhari N. Maternal and perinatal outcomes in obstetric cholestasis: data of a tertiary care hospital. J Med Sci. 2022;30(2):126-30. https://doi.org/10.52764/jms.22.30.2.5
4. Hassan G, Inam I, Sajjad S. Pregnancy outcomes with intrahepatic cholestasis. Pak J Med Health Sci. 2022;16(5):216. https://doi.org/10.53350/pjmhs22165216
5. Hamdard SJ, Samad A, Khan F, Waleem N. Maternal and fetal outcome in pregnancy complicated by intrahepatic cholestasis of pregnancy. J Soc Obstet Gynaecol Pak. 2024;14(3):310-15.
6. Teng J, Bohlin K, Nemeth A, Fischler B. Cholestasis after very preterm birth was associated with adverse neonatal outcomes but no significant long-term liver disease: a population-based study. Acta Paediatr. 2021;110(1):141-8. https://doi.org/10.1111/apa.15362
7. Kawakita T, Parikh LI, Ramsey PS, Huang CC, Zeymo A, Fernandez M, et al. Predictors of adverse neonatal outcomes in intrahepatic cholestasis of pregnancy. Am J Obstet Gynecol. 2015;213(4):570.e1-8. https://doi.org/10.1016/j.ajog.2015.06.021
8. Rehman N, Aslam S, Siddique US, Jamil F, Khttab A. Fetomaternal outcome among pregnant women presented with obstetric cholestasis. Biol Clin Sci Res J. 2024;2024(1):1442. https://doi.org/10.54112/bcsrj.v2024i1.1442
9. Anwar R, Razzaq K, Noor N, Ansari A, Imran A. Impact of obstetric cholestasis on fetomaternal outcome. Pak Armed Forces Med J. 2022;72(Suppl 2):S379-83. https://doi.org/10.51253/pafmj.v72iSUPPL-2.4954
10. Nasir A, Muneer N, Butt A, Hameed S, Asif S, Rana MN. Fetomaternal outcomes in intrahepatic cholestasis of pregnancy at tertiary care hospital in Lahore. Natl J Health Sci. 2025;10(2):135-40. https://doi.org/10.21089/njhs.102.0135
11. Madhu M, Hansda R, Bharti A, Kumari P. Fetomaternal outcome in obstetric cholestasis in a tertiary care hospital. Ann Afr Med. 2025;0:0. https://doi.org/10.4103/aam.aam_100_25
12. Upreti P. Intrahepatic cholestasis of pregnancy and fetomaternal outcomes: a retrospective study from Uttarakhand, India. J South Asian Feder Obst Gynaecol. 2024;16(5):479-85. https://doi.org/10.5005/jp-journals-10006-2459
13. Singh T, Rasheed M, Nagaraja N, Jain C, Yazdani S. Intrahepatic cholestasis of pregnancy: adverse fetomaternal outcome.

J Popul Ther Clin Pharmacol. 2024;31(4):1693-9. https://doi.org/10.53555/jptcp.v31i4.6007
14. Valdovinos-Bello V, García-Romero CS, Cervantes-Peredo A, García-Gómez E, Martínez-Ibarra A, Vázquez-Martínez ER, et al. Body mass index implications in intrahepatic cholestasis of pregnancy and placental histopathological alterations. Ann Hepatol. 2023;28(1):100879. https://doi.org/10.1016/j.aohep.2022.100879
15. Martineau M, Raker C, Powrie R, Williamson C. Intrahepatic cholestasis of pregnancy is associated with an increased risk of gestational diabetes. Eur J Obstet Gynecol Reprod Biol. 2014;176:80-5. https://doi.org/10.1016/j.ejogrb.2013.11.024
16. Mukhopadhyay AK, Mukhopadhyay M, Anjum N. Feto-maternal outcomes in intrahepatic cholestasis of pregnancy in a state teaching hospital. Eur J Cardiovasc Med. 2025;15(7):862-6.
17. Sridhar S, Tirkey R, Sanga AJ. To correlate maternal serum total bile acids and fetomaternal outcomes in obstetric cholestasis. Indian J Obstet Gynecol Res. 2025;12(3):487-94.