Early Diagnosis Strategies and Maternal/Fetal Outcomes in Acute Fatty Liver of Pregnancy

Amna Javed[1], Muhammad Bilal Nasir, Ghias ul Hassan, Saira Fayyaz, Amna Ahsan Cheema, Muhammad Akif Dilshad

[1]Assistant Professor, Department of Obstetrics & Gynecology, Al-Aleem Medical College, Gulab Devi Hospital, Lahore, Pakistan

[2]Associate Professor, Department of Medicine/Gastroenterology, Al-Aleem Medical College, Gulab Devi Hospital, Lahore, Pakistan

[3]Associate Professor, Department of Medicine/Gastroenterology, Ameer-ud-Din Medical College, Postgraduate Medical Institute, Lahore General Hospital, Lahore, Pakistan

[4]Associate Professor, Department of Obstetrics & Gynecology, Ameer-ud-Din Medical College, Postgraduate Medical Institute, Lahore General Hospital, Lahore, Pakistan

[5]Professor, Department of Obstetrics & Gynecology, Ameer-ud-Din Medical College, Postgraduate Medical Institute, Lahore General Hospital, Lahore, Pakistan

[6]Professor, Department of Medicine/Gastroenterology, Ameer-ud-Din Medical College, Postgraduate Medical Institute, Lahore General Hospital, Lahore., Pakistan

Corresponding Author: Dr. Amna Javed, Email: dramnajaved2008@gmail.com,

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ABSTRACT

Background: Acute fatty liver of pregnancy is an exceptional however possibly disastrous obstetric crisis that overwhelmingly shows within the third trimester. Deferred acknowledgment carries a significant chance of maternal and fetal mortality. In spite of progress in clinical mindfulness, the demonstrative approach and prognostic determinants in resource-limited settings remain insulant characterized.

Objective: To evaluate the clinical introduction, early symptomatic methodologies, and maternal and fetal results in ladies analyzed with intense fatty liver of pregnancy at a tertiary care clinic in Pakistan.

Methods: A descriptive cross-sectional study was conducted within the Department of Obstetrics & Gynecology, Department of Medicine/Gastroenterology, Al-Aleem Medical College, Gulab Devi Hospital, Lahore and Ameer-ud-Din Medical College, Postgraduate Medical Institute, Lahore General Hospital, Lahore from July 2023 to June 2025. A add up to of 174 pregnant ladies who satisfied the Swansea criteria for intense greasy liver of pregnancy were selected. Statistic data, clinical highlights, research facility parameters, demonstrative modalities, time from side effect onset to conclusion, mode of conveyance, and maternal and fetal results were recorded. Information was analyzed utilizing SPSS adaptation 26.0, with expressive and inferential measurements connected as suitable.

Results: The mean age of members was 27.8 ± 4.6 a long time, and the lion's share (72.4%) was displayed within the third trimester past 34 weeks of development. The most visit showing side effects were nausea and vomiting (84.5%), jaundice (78.2%), stomach pain (65.5%), and discomfort (59.8%). The Swansea criteria were met by all cases, with hypoglycemia distinguished in 46.0%, hoisted transaminases in 91.4%, raised bilirubin in 82.8%, and coagulopathy in 54.0%. Early determination, characterized as acknowledgment inside 48 hours of indication onset, was accomplished in 58.6% of cases and was altogether related with lower maternal mortality (4.9% vs 18.1%; p=0.006), lower fetal mortality (8.8% vs 22.2%; p=0.02), and less maternal complications counting spread intravascular coagulation and intense kidney damage. Maternal mortality within the generally cohort was 10.3% and perinatal mortality was 14.4%. Emergency cesarean area was performed in 62.1% of cases.

Keywords: Intense greasy liver of pregnancy; Swansea criteria; maternal mortality; fetal results; early conclusion; pregnancy complications

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INTRODUCTION

Among the liver disorders unique to pregnancy, intense fatty liver of pregnancy possesses a position of particular clinical gravity. In spite of the fact that significantly rarer than conditions such as intrahepatic cholestasis or the HELLP disorder, it carries a excessively tall case casualty rate when conclusion and intercession are postponed. The condition is characterized by microvesicular fatty penetration of hepatocytes, driving to progressive hepatic failure that can quickly break down into multiorgan brokenness, coagulopathy, encephalopathy, and passing on the off chance that not expeditiously recognized and overseen. The detailed rate of AFLP shifts over populaces, with gauges extending from roughly 1 in 7,000 to 1 in 20,000 pregnancies in Western writing. In South Asian populaces, exact frequency figures are troublesome to discover owing to underdiagnosis, constrained histopathological affirmation, and cover with other

hepatic conditions of pregnancy. Clinical involvement in Pakistani tertiary centers, in any case, proposes that the condition may not be as uncommon as customarily accepted, which late referrals from essential and auxiliary care offices contribute considerably to the destitute results watched in this setting.

The pathophysiology of AFLP has been connected in a subset of cases to acquired defects in mitochondrial fatty acid beta-oxidation, especially long-chain 3-hydroxyacyl-CoA dehydrogenase lack within the baby. When the baby is homozygous or compound heterozygous for changes within the HADHA quality, middle of the road metabolites of greasy corrosive oxidation collect and are exchanged to the maternal circulation, where they apply coordinate hepatotoxic impacts. In any case, this hereditary component accounts for as it were a minority of cases, and within the lion's share of influenced ladies, the exact trigger remains slippery. Hormonal variables, placental pathology, dietary status, and as-yet-unidentified hereditary susceptibilities are thought to play contributing parts.

Clinically, AFLP tends to present within the third trimester, most regularly between 30 and 38 weeks of gestation, though rare cases within the late moment trimester and early postpartum period have been depicted. The beginning side effects are as often as possible nonspecific sickness, vomiting, anorexia, stomach distress, and discomfort Ã¢ and may be mistaken for common pregnancy complaints, viral hepatitis, or pre-eclampsia. As the illness advances, jaundice, coagulopathy, hypoglycemia, ascites, and hepatic encephalopathy may supervene. The cover of clinical and research facility highlights with extreme pre-eclampsia, HELLP disorder, and viral hepatitis presents a veritable symptomatic challenge, especially in settings where progressed imaging and specialized liver work testing are not promptly accessible.

The Swansea criteria, to begin with proposed by changing and colleagues in 2002, have emerged as the foremost broadly adopted clinical diagnostic framework for AFLP within the absence of liver biopsy. These criteria incorporate a combination of clinical highlights and research facility discoveries, counting heaving, stomach torment, polydipsia and polyuria, encephalopathy, lifted bilirubin, hypoglycemia, lifted urate, leukocytosis, ascites or shinning liver on ultrasound, raised transaminases, hoisted smelling salts, renal disability, and coagulopathy. A determination of AFLP is considered when six or more of these criteria are show within the absence of another identifiable cause. In spite of the fact that the Swansea criteria have been approved in a few cohorts, their execution in South Asian populations has not been broadly examined.

The foundation of AFLP administration is speedy delivery, which removes the feto-placental unit and stops the obsessive cascade. Steady care, including redress of coagulopathy, administration of hypoglycemia, renal support, and intensive observing in a basic care setting, is basic. Maternal and fetal results have made impressive strides over the past three decades with earlier acknowledgment and forceful strong administration, but mortality remains noteworthy, especially in low-resource settings where deferred introduction and restricted basic care foundation stay tireless obstructions.

The present study was undertaken to characterize the clinical profile and demonstrative approach to AFLP in a Pakistani tertiary care setting, to survey the extent of cases analyzed early versus late, and to assess the affect of symptomatic timing on maternal and fetal results. By producing locally significant information, we point to contribute to a more educated approach to the acknowledgment and administration of this life-threatening condition in our population.

MATERIALS AND METHODS

Study Design and Setting

This descriptive cross-sectional study was conducted at the Department of Obstetrics & Gynecology, Department of Medicine/Gastroenterology, Al-Aleem Medical College, Gulab Devi Hospital, Lahore and Ameer-ud-Din Medical College, Postgraduate Medical Institute, Lahore General Hospital, Lahore, a tertiary referral center situated in Lahore, Pakistan. The hospital serves as a major referral hub for complicated obstetric cases from a wide catchment area encompassing both urban and rural populations. Ethical approval was obtained from the Institutional Review Board prior to the commencement of data collection.

Study Period and Population

The study covered a two-year period from July 2023 to June 2025. All pregnant women conceded amid this period who satisfied the demonstrative criteria for AFLP were considered for inclusion. The determination was set up utilizing the Swansea criteria, which require the nearness of six or more of the taking after highlights within the nonattendance of another clarification: heaving, stomach torment, polydipsia or polyuria, encephalopathy, lifted bilirubin (over 14 µmol/L), hypoglycemia (underneath 4 mmol/L), hoisted uric corrosive (over 340 µmol/L), leukocytosis (over $11x10^9$/L), ascites or shinning liver on ultrasonography, raised transaminases (AST or ALT over 42 IU/L), hoisted smelling salts (over 47 µmol/L), renal disability (creatinine over 150 µmol/L), and coagulopathy (prothrombin time over 14 seconds or enacted halfway thromboplastin time over 34 seconds).

Inclusion and Exclusion Criteria

Consideration criteria comprised pregnant ladies at any gestational age who met the Swansea symptomatic criteria for AFLP amid the think about period. Both alluded and specifically conceded patients were included. Women were avoided on the off chance that the hepatic brokenness was inferable to an elective etiology, counting affirmed viral hepatitis (hepatitis A, B, C, or E verified by serological testing), drug-induced liver harm, immune system hepatitis, or pre-

existing inveterate liver illness. Cases where the clinical records were deficient or where the determination remained questionable after master audit were too avoided.

Data Collection

Data were collected using a organized proforma planned for this purpose. Factors recorded included maternal age, equality, gestational age at introduction, referral status (coordinate affirmation versus referral from another office), displaying side effects and clinical signs, Swansea criteria components met, time interim from indication onset to determination, research facility parameters at confirmation (serum bilirubin, transaminases, blood glucose, serum creatinine, uric corrosive, platelet number, prothrombin time, worldwide normalized proportion, enacted halfway thromboplastin time, serum alkali, and total blood check), ultrasonographic discoveries, mode of conveyance, and maternal and fetal results. Given the clear nature of this ponder, a comfort test of all qualified cases showing amid the two-year think about period was selected. A add up to of 174 ladies who met the incorporation criteria were identified and included within the last examination.

Information were entered and analyzed utilizing SPSS adaptation 26.0 (IBM Corp., Armonk, NY). Nonstop factors were communicated as cruel ± standard deviation or middle with interquartile extend, as fitting based on the dispersion evaluated by the Shapiro-Wilk test. Categorical factors were displayed as frequencies and rates. Comparisons between the early and late determination bunches were made utilizing the free tests t-test or Mann-Whitney U test for ceaseless factors and the chi-square test or Fisher s correct test for categorical factors. A p-value of less than 0.05 was considered measurably noteworthy.

RESULTS

Demographic and Clinical Characteristics

Over the two-year study period, 174 women were analyzed with acute fatty liver of pregnancy and included within the investigation. The mean maternal age was 27.8 ± 4.6 a long time, with the largest proportion (44.8%) falling within the 25–30-year age bunch. The larger part of members was multigravida (61.5%), and 72.4% displayed at a gestational age past 34 weeks. Around 41.4% of cases were referrals from fringe healthcare offices, whereas the leftover portion were specifically referred through the hospitall crisis division. The cruel interval from indication onset to healing centre introduction was 3.2, ± 2.1 days. The pattern statistic characteristics are summarized in Table 1.

Table 1: Demographic and Clinical Characteristics of Study Participants (n=174)

Variable	n / Mean	% / ± SD
Age (years), mean ± SD	27.8	± 4.6
Age 18–24 years	38	21.8%
Age 25–30 years	78	44.8%
Age 31–40 years	58	33.3%
Primigravida	67	38.5%
Multigravida	107	61.5%
Gestational age ≤34 weeks	48	27.6%
Gestational age >34 weeks	126	72.4%
Directly admitted	102	58.6%
Referred from peripheral facility	72	41.4%
Symptom-to-presentation interval (days)	3.2	± 2.1

SD = standard deviation

Clinical Presentation and Swansea Criteria

The presenting symptoms were changed but followed a recognizable design. Sickness and vomiting were the most commonly reported complaints, present in 147 ladies (84.5%), followed by jaundice in 136 (78.2%), right upper quadrant or epigastric torment in 114 (65.5%), generalized disquietude and weakness in 104 (59.8%), polydipsia and polyuria in 62 (35.6%), and encephalopathy of shifting grades in 48 (27.6%). Among the research facility components of the Swansea criteria, elevated transaminases were the foremost predominant finding (91.4%), taken after by raised serum bilirubin (82.8%), coagulopathy (54.0%), hypoglycemia (46.0%), renal impedance (38.5%), lifted uric corrosive (62.1%), leukocytosis (71.3%), and hoisted alkali (33.9%). Ascites or a hyperechoic liver on ultrasound was famous in 44.3% of cases. The cruel number of Swansea criteria met per persistent was 8.4 ± 1.9. The recurrence of person Swansea criteria components is nitty gritty in Table 2.

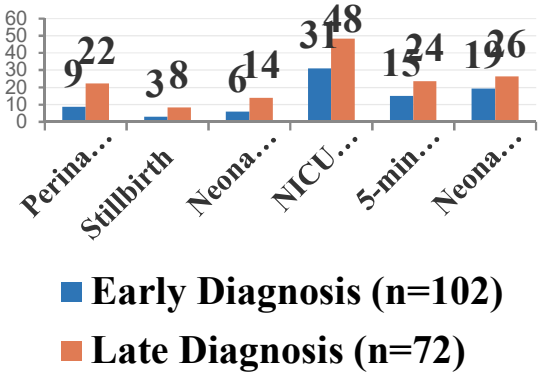
Table 2: Frequency of Swansea Criteria Components Among Study Participants (n=174)

Swansea Criterion	n	%
Vomiting	147	84.5%
Abdominal pain	114	65.5%
Polydipsia / Polyuria	62	35.6%
Encephalopathy	48	27.6%
Elevated bilirubin (>14 µmol/L)	144	82.8%
Hypoglycemia (<4 mmol/L)	80	46.0%
Elevated uric acid (>340 µmol/L)	108	62.1%
Leukocytosis (>11×10⁹/L)	124	71.3%
Ascites / Bright liver on ultrasound	77	44.3%
Elevated transaminases (AST/ALT >42 IU/L)	159	91.4%
Elevated ammonia (>47 µmol/L)	59	33.9%
Renal impairment (creatinine >150 µmol/L)	67	38.5%

Coagulopathy (PT >14 sec or aPTT >34 sec)	94	54.0%

AST = aspartate aminotransferase; ALT = alanine aminotransferase; PT = prothrombin time; aPTT = activated partial thromboplastin time.

Early conclusion (within 48 hours of side effect onset) was accomplished in 102 ladies (58.6%), whereas 72 women (41.4%) were classified as late diagnoses. The late conclusion bunch had a significantly higher extent of referrals from fringe offices (63.9% versus 25.5%; p<0.001) and a longer cruel symptom-to-presentation interim (4.8 ± 1.7 days versus 1.9 ± 0.8 days; p<0.001). Women analyzed late were more likely to display with advanced highlights such as encephalopathy (41.7% versus 17.6%; p<0.001) and coagulopathy (70.8% versus 42.2%; p<0.001).



*** Perinatal mortality (p = 0.02) and NICU admission (p = 0.04) were statistically significant**

Maternal Outcomes

Generally maternal mortality within the cohort was 10.3% (18 of 174). The distinction between the early and late conclusion groups was striking: maternal passing occurred in 5 of 102 ladies (4.9%) within the early group compared with 13 of 72 (18.1%) within the late group (p=0.006). Disseminated intravascular coagulation was diagnosed in 31.6% of the generally cohort, with altogether higher rates within the late bunch (45.8% versus 21.6%; p=0.001). Intense kidney harm happened in 27.0% of all members, once more more regularly among those analyzed late (37.5% versus 19.6%; p=0.01). Hepatic encephalopathy of review II or higher created in 24.1% of the cohort, with a unbalanced burden within the late determination bunch (36.1% versus 15.7%; p=0.002). Seriously care unit confirmation was required for 55.2% of ladies, and mechanical ventilation for 16.1%. Postpartum hemorrhage complicated 21.8% of deliveries. The point by point comparison of maternal results is displayed in Table 3.

Table 3: Maternal Outcomes by Diagnostic Timing (n=174)

Outcome	Overall n (%)	Early Dx (n=102)	Late Dx (n=72)	χ^2 / t	p-value
Maternal mortality	18 (10.3%)	5 (4.9%)	13 (18.1%)	7.52	0.006*
DIC	55 (31.6%)	22 (21.6%)	33 (45.8%)	11.26	0.001*
Acute kidney injury	47 (27.0%)	20 (19.6%)	27 (37.5%)	6.68	0.01*
Encephalopathy ≥ Grade II	42 (24.1%)	16 (15.7%)	26 (36.1%)	9.25	0.002*
ICU admission	96 (55.2%)	48 (47.1%)	48 (66.7%)	6.41	0.01*
Mechanical ventilation	28 (16.1%)	10 (9.8%)	18 (25.0%)	7.09	0.008*
Postpartum hemorrhage	38 (21.8%)	18 (17.6%)	20 (27.8%)	2.47	0.12

* Statistically significant at p<0.05; DIC = disseminated intravascular coagulation; ICU = intensive care unit; Dx = diagnosis.

Mode of Delivery

Emergency cesarean section was the most common mode of delivery, performed in 108 women (62.1%). Vaginal delivery happened in 52 cases (29.9%), whereas 14 women (8.0%) experienced actuated labor that advanced to vaginal delivery. The choice for cesarean section was impacted by fetal trouble, maternal weakening, unfavorable cervical status, or a combination of these components. There was no measurably noteworthy contrast in maternal mortality between cesarean and vaginal conveyance bunches (11.1% versus 9.1%; p=0.72), in spite of the fact that women who experienced cesarean delivery had higher rates of postpartum hemorrhage (26.9% versus 12.1%; p=0.04).

Figure 5: Mode of Delivery in AFLP Cases (n=174)

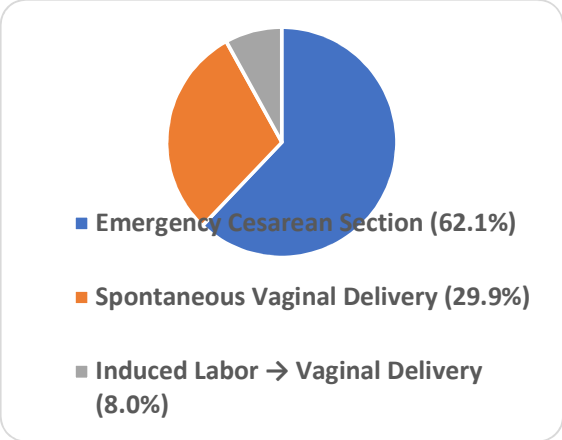


Figure 5: Mode of Delivery in AFLP Cases (n=174)

No significant difference in maternal mortality between cesarean and vaginal delivery (11.1% vs 9.1%; p = 0.72)

The generally perinatal mortality rate was 14.4% (25 of 174). Stillbirth accounted for 9 cases (5.2%) and early neonatal passing for 16 cases (9.2%). Within the early determination gather, perinatal mortality was 8.8% (9 of 102) compared with 22.2% (16 of 72) within the late bunch (p=0.02). The mean birth weight was 2.4 ± 0.6 kg, and the cruel 5-minute Apgar score among live births was 7.2 ± 1.8. Neonatal intensive care unit admission was required for 38.5% of live neonates, with a better extent within the late determination bunch (48.2% versus 31.2%; p=0.04). Neonatal hypoglycemia was reported in 22.4% of live births. A comparison of fetal and neonatal results is shown in Table 4.

Table 4: Fetal and Neonatal Outcomes by Diagnostic Timing (n=174)

Outcome	Overall n (%)	Early Dx (n=102)	Late Dx (n=72)	χ^2 / t	p-value
Perinatal mortality	25 (14.4)	9 (8.8%)	16 (22.2%)	5.84	0.02
Stillbirth	9 (5.2)	3 (2.9%)	6 (8.3%)	2.31	0.16
Neonatal death (≤7 days)	16 (9.2)	6 (5.9%)	10 (13.9%)	3.12	0.08
NICU admission	64 (38.5)*	29 (31.2%)	35 (48.2%)†	4.38	0.04
5-min Apgar <7	31 (18.8)*	14 (15.1%)	17 (23.6%)†	1.86	0.17
Neonatal hypoglycemia	37 (22.4)*	18 (19.4%)	19 (26.4%)†	1.15	0.28

* Among live births; percentage of live births in respective group; NICU = neonatal intensive care unit; Dx = diagnosis.

DISCUSSION

The findings of this cross-sectional think about emphasize the basic significance of convenient diagnosis in deciding the guess of acute fatty liver of pregnancy. In our cohort of 174 ladies overseen at a single tertiary referral center in Pakistan, by and large maternal mortality stood at 10.3% and perinatal mortality at 14.4%, figures that are broadly reliable with reports from other creating nations but impressively higher than the mortality rates of 12% described in later Western arrangement. This difference likely reflects the considerable burden of late referrals, constrained get to to basic care offices in fringe centers, and the symptomatic challenges characteristic to a condition whose early indications imitate common pregnancy complaints. The foremost compelling perception in our information is the solid affiliation between demonstrative timing and results. Ladies in whom AFLP was recognized inside 48 hours of side effect onset had a maternal mortality rate of 4.9%, compared with 18.1% among those analyzed after this window. This about fourfold distinction held on over essentially all complications surveyed, including DIC, intense kidney damage, hepatic encephalopathy, and the requirement for mechanical ventilation. The fetal picture reflected this design, with perinatal mortality generally two and a half times higher within the late determination bunch. These perceptions, whereas not building up causality given the cross-sectional plan, are reliable with the well-established rule that early delivery is the authoritative treatment for AFLP which delays in its execution allow the dynamic hepatic disappointment and multiorgan brokenness that drive mortality.

A notable finding was the disproportionate representation of alluded patients within the late conclusion gather. About two-thirds of women analyzed late had been alluded from fringe offices, compared with as it were a quarter of those analyzed early. This design has been archived in other thinks about from moo- and middle-income settings and focuses to a systems-level disappointment: the failure of essential and auxiliary care suppliers to recognize AFLP in its early stages, when the clinical highlights are nonspecific and effortlessly credited to more generous conditions. Sickness, heaving, and disquietude in a third-trimester lady may be expelled as schedule pregnancy inconvenience, and jaundice may at first be examined as viral hepatitis, consuming

valuable time some time recently the proper conclusion is engaged.

The Swansea criteria demonstrated to be a commonsense and open symptomatic system in our setting. All 174 cases in this consider satisfied six or more criteria, and the cruel number of criteria met was 8.4, recommending that by the time these ladies come to our tertiary center, the illness had advanced to a organize where the clinical picture was unambiguous. This raises the address of whether prior application of the Swansea criteria at the point of to begin with contact some time recently the complete star grouping of highlights has created might encourage more opportune referral and intercession. The approval and dispersal of a disentangled screening device or checklist adjusted from the Swansea criteria for utilize at the essential care level merits investigation in future investigate.

The laboratory profile of our cohort is steady with the setup writing on AFLP. Elevated transaminases were the most predominant research facility finding, display in over 90% of cases, followed by hyperbilirubinemia and coagulopathy. Hypoglycemia, a trademark of serious AFLP that recognizes it from most other hepatic conditions of pregnancy, was archived in 46% of our patients a figure that's clinically noteworthy and underscores the significance of schedule glucose checking in any pregnant lady showing with liver brokenness within the third trimester. The nearness of hypoglycemia ought to trigger a tall record of doubt for AFLP and incite prompt assessment.

Crisis cesarean segment was performed in 62.1% of our cases, a figure that reflects both the seriousness of maternal sickness at introduction and the criticalness with which conveyance is sought after in this condition. Interests, the mode of conveyance did not altogether impact maternal mortality in our cohort, consistent with the see that it is the timing of conveyance, instead of the route, that's the foremost determinant of result. Be that as it may, the higher rate of postpartum hemorrhage within the cesarean gather is essential and likely reflects the fundamental coagulopathy that characterizes serious AFLP.

A few limitations of this study warrant acknowledgment. The cross-sectional plan blocks the foundation of causal connections between symptomatic timing and results. The single-center setting, which guarantees uniform demonstrative and administration conventions, limits the generalizability of the discoveries to other populations and healthcare frameworks. The definition of early versus late conclusion, based on the interim from indication onset as detailed by patients, is subject to review predisposition. Liver biopsy, the gold standard for AFLP conclusion, was not performed in any case owing to the coagulopathy and clinical flimsiness that characterized most introductions, meaning that the determination rested completely on clinical and research facility criteria. At long last, long-term follow-up of maternal hepatic recovery and neonatal neurodevelopmental results was past the scope of this ponder and speaks to an critical road for future examination. In spite of these confinements, the show consider includes to the constrained body of prove on AFLP in South Asian populaces and gives locally important information on the affect of demonstrative timing on results. The consistency of our discoveries with bigger worldwide arrangement reinforces the outside legitimacy of the perceptions and underpins the widespread appropriateness of the guideline that early acknowledgment and provoke conveyance are the foundations of AFLP administration.

CONCLUSION

Acute fatty liver of pregnancy, in spite of the fact that exceptional, carries a imposing hazard of maternal and fetal mortality, especially when acknowledgment is postponed. In this cohort of 174 ladies overseen at a Pakistani tertiary care center, early conclusion inside 48 hours of side effect onset was related with altogether lower rates of maternal passing, spread intravascular coagulation, intense kidney harm, hepatic encephalopathy, and perinatal mortality. The Swansea criteria served as a down to earth symptomatic system, and the most imperative indicator of deferred determination was referral from a fringe healthcare office. These discoveries fortify the need of consolidating AFLP into the differential determination of any pregnant lady displaying with sickness, heaving, jaundice, or liver brokenness within the third trimester, and highlight the critical require for instructive activities focusing on essential and auxiliary care suppliers in locales where late referral remains a critical donor to preventable maternal and fetal passings.

Conflict of Interest

The authors declare no conflicts of interest.

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