

Comparison of Maternal and Neonatal Outcomes between Acute Fatty Liver of Pregnancy and HELLP Syndrome

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Background: Acute fatty liver of pregnancy (AFLP) and hemolysis, elevated liver enzymes and low platelets (HELLP) syndrome are two uncommon disorders that mimic each other clinically, but are distinct pathophysiologically.

Methods: This retrospective cohort study was performed at a tertiary referral center in Taiwan between June 2004 and April 2020. We used the Swansea Criteria to diagnose AFLP, and the Tennessee Classification System to diagnose HELLP syndrome. Maternal characteristics, laboratory data, complications, and neonatal outcomes were compared.

Results: During the study period, 21 women had AFLP and 80 women had HELLP syndrome. There was a higher rate of preeclampsia (95.0 % versus 23.8 %) in the HELLP syndrome group compared to the AFLP group. However, the AFLP group had more other maternal complications including jaundice (85.7 % versus 13.8 %), acute kidney injury (61.9 % versus 15.0 %), disseminated intravascular coagulopathy (66.7 % versus 8.8 %), and sepsis (47.6 % versus 10.0 %) compared to the HELLP syndrome group. Nevertheless, higher rates of small for gestational age neonates (57.1 % versus 33.3 %), neonatal respiratory distress syndrome (39.2 % versus 8.3 %) and neonatal sepsis (34.2 % versus 12.5 %) were noted in the HELLP syndrome group.

Conclusions: AFLP is associated with a higher rate of multiple organ dysfunction in mothers, whereas HELLP syndrome is associated with a higher rate of neonatal morbidity.

Maternal complications in the AFLP and HELLP syndrome groups										
	AFLP versus HELLP syndrome			AFLP versus complete HELLP syndrome						
	AFLP (n=21)	HELLP syndrome (n=80)	P	P ^a	Adjusted OR (95% CI)	AFLP (n=21)	Complete HELLP syndrome (n=18)	P	P ^a	Adjusted OR (95% CI)
Preeclampsia ^b	5 (23.8)	76 (95.0)	<0.001*	<0.001*	0.02 (0.01, 0.11)	5 (23.8)	16 (88.9)	<0.001*	0.006*	0.03 (0.01, 0.35)
Preeclampsia with severe features ^b	1 (4.8)	76 (95.0)	<0.001*	<0.001*	0.01 (0.01, 0.03)	1 (4.8)	16 (88.9)	<0.001*	0.002*	0.01 (0.01, 0.13)
Hypoglycaemia ^b	6 (28.6)	2 (2.5)	0.001*	0.026*	11.28 (1.33, 95.66)	6 (28.6)	1 (5.6)	0.098		
Jaundice ^b	18 (85.7)	11 (13.8)	<0.001*	<0.001*	32.45 (6.12, 171.94)	18 (85.7)	5 (27.8)	<0.001*	0.007*	14.94 (2.68, 107.29)
Pulmonary edema ^b	2 (9.5)	8 (10.0)	>0.99			2 (9.5)	5 (27.8)	0.215		
AKI ^b	13 (61.9)	12 (15.0)	<0.001*	0.003*	6.78 (1.89, 24.32)	13 (61.9)	6 (33.3)	0.075		
DK ^b	14 (66.7)	7 (8.8)	<0.001*	<0.001*	12.67 (3.11, 51.56)	14 (66.7)	1 (5.6)	<0.001*	0.012*	21.27 (1.93, 231.64)
PPH ^b	2 (9.5)	10 (12.5)	>0.99			2 (9.5)	4 (22.2)	0.387		
Sepsis ^b	10 (47.6)	8 (10.0)	<0.001*	0.036*	4.30 (1.10, 16.88)	10 (47.6)	4 (22.2)	0.099		
Gastrointestinal bleeding ^b	1 (4.8)	0 (0)	0.208			1 (4.8)	0 (0)	>0.99		
Wound hematoma ^b	2 (9.5)	2 (2.5)	0.190			2 (9.5)	1 (5.6)	>0.99		
Placental abruption ^b	1 (4.8)	5 (6.3)	>0.99			1 (4.8)	0 (0)	>0.99		
Blood transfusion ^b	8 (38.1)	17 (21.3)	0.111			8 (38.1)	6 (33.3)	0.757		
Liver transplantation ^b	1 (4.8)	0 (0)	0.208			1 (4.8)	0 (0)	>0.99		
Postpartum event ^b	1 (4.8)	10 (12.5)	0.451			1 (4.8)	4 (22.2)	0.162		
Length of hospitalization (days) ^c	9 (7.0)	6 (5.8)	0.066			9 (7.0)	6.5 (7.0)	0.223		
ICU admission ^d	4 (19.0)	8 (10.0)	0.267			4 (19.0)	3 (16.7)	>0.99		
Maternal death ^e	0 (0)	1 (1.3)	>0.99			0 (0)	1 (5.6)	0.462		

AFLP acute fatty liver of pregnancy; HELLP hemolysis, elevated liver enzymes and low platelets; OR odds ratio; CI confidence interval; AKI acute kidney injury; DIC disseminated intravascular coagulopathy; PPH postpartum hemorrhage; ICU intensive care unit
^aP adjusted by BMI and twin pregnancy
^bChi-square or Fisher's exact test, results are presented as number (percentage)
^cMann-Whitney U test, results are presented as median (interquartile range)
^d* <0.05 was considered to be statistically significant

Neonatal outcomes of the AFLP and HELLP syndrome groups										
	AFLP versus HELLP syndrome				AFLP versus complete HELLP syndrome					
	AFLP (n=27)	HELLP syndrome (n=84)	P	P ^a	Adjusted B or OR (95% CI)	AFLP (n=27)	Complete HELLP syndrome (n=18)	P	P ^a	Adjusted B or OR (95% CI)
Birth age (weeks) ^b	34.6 (3.4) (33, 36)	33.9 (6.9) (32, 34)	0.137			34.6 (3.4) (33, 36)	34 (9) (32, 36)	0.449		
Birth weight (g) ^c	2235.5 ± 591.7 (1996.5, 2474.5)	1686.1 ± 735.1 (1518.1, 185.4)	0.001*	0.006*	590.5 (177.7, 1003.4)	2235.5 ± 591.7 (1996.5, 2474.5)	1784.0 ± 583.17 (1473.3, 2094.2)	0.020*	0.015*	606.97 (126.55, 1087.38)
Apgar score (1 min) ^b	8 (5)	7 (9)	0.540			8 (5)	6.5 (2)	0.378		
Apgar score (5 min) ^b	9 (3)	9 (1)	0.512			9 (3)	8.5 (1)	0.328		
Male ^d	17/27 (63)	45/84 (53)	0.393			17/27 (63)	12/18 (66.7)	0.799		
SGA ^e	9/27 (33.3)	48/84 (57.1)	0.031*	0.049*	0.32 (0.10, 0.99)	9/27 (33.3)	12/18 (66.7)	0.028*	0.029*	0.15 (0.03, 0.82)
Stillbirth ^d	3/27 (11.1)	5/84 (6)	0.400			3/27 (11.1)	0/18 (0)	0.143		
Live birth complication										
ICH ^d	0/24 (0)	3/79 (3.8)	>0.99			0/24 (0)	0/18 (0)	NA		
RDS ^d	2/24 (8.3)	31/79 (39.2)	0.004*	0.012*	0.11 (0.02, 0.61)	2/24 (8.3)	7/18 (38.9)	0.025*	0.042*	0.14 (0.02, 0.95)
TIN ^d	11/24 (45.8)	31/79 (39.2)	0.565			11/24 (45.8)	11/18 (61.1)	0.327		
PPHN ^d	0/24 (0)	2/79 (2.5)	>0.99			0/24 (0)	0/18 (0)	NA		
Sepsis ^d	3/24 (12.5)	27/79 (34.2)	0.041*	0.024*	0.17 (0.04, 0.79)	3/24 (12.5)	8/18 (44.4)	0.033*	0.033*	0.12 (0.02, 0.85)
NICU admission ^d	10/24 (41.7)	43/79 (54.4)	0.273			10/24 (41.7)	11/18 (61.1)	0.212		
Neonatal mortality ^d	0/24 (0)	6/79 (7.6)	0.332			0/24 (0)	0/18 (0)	NA		

AFLP acute fatty liver of pregnancy; HELLP hemolysis, elevated liver enzymes and low platelets; OR odds ratio; CI confidence interval; SGA small for gestational age; ICH intracranial hemorrhage; NA non-applicable; RDS respiratory distress syndrome; TIN transient tachypnea of the newborn; PPHN persistent pulmonary hypertension of the newborn; NICU neonatal intensive care unit
^aP adjusted by maternal body mass index and twin pregnancy
^bMann-Whitney U test, results are presented as median (interquartile range), (95% confidence interval)
^cStudent's t test, results are presented as mean ± standard deviation, (95% confidence interval)
^dChi-square or Fisher's exact test, results are presented as number (percentage)
^e* <0.05 was considered to be statistically significant

