Predictors of Hypertensive Disorders of Pregnancy Among Patients with Inflammatory Bowel Disease

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Background

- Inflammatory bowel disease (IBD), which includes Crohn's disease (CD) and ulcerative colitis (UC), affected about 6.8 million people around the world in 2017[1] with prevalence continuing to rise worldwide[2].
- Patients with IBD are advised to avoid non-steroidal anti-inflammatory drugs (NSAIDs) because NSAID use can damage small intestine mucosa and exacerbate IBD activity[3,4].
- In pregnancy, patients with IBD are at higher risk of developing severe preeclampsia[5] and, despite typical NSAID avoidance, they are advised to start daily low dose aspirin in the second trimester for preeclampsia prophylaxis[6,7].
- **Objectives:**
  - Investigate predictors of hypertensive disorders of pregnancy (HDP) in patients with inflammatory bowel disease (IBD)
  - Evaluate the rate of use of low-dose aspirin (LDA) prophylaxis in patients with IBD.
- **Hypothesis:**
  - Medical co-morbidities were often present and associated with high rates of preeclampsia.
  - LDA was underutilized in this vulnerable population.

Methods

- **Study design:** Retrospective cohort study at a single academic center from 1/1/2019 to 12/31/2023 consisting of100 singleton deliveries among patients with IBD
- **Primary outcome:** Development of HDP, including gestational hypertension or preeclampsia
- **Secondary outcomes:** LDA use, pregnancy outcomes, and IBD disease activity
- **Statistical analysis:** Kruskal-Wallis test or the Chi-squared test. Multivariate logistic regression was used to identify independent predictors of HDP.

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Approximately 1 in 5 patients in our cohort developed hypertensive disorders of pregnancy. Despite elevated risk, LDA prophylaxis appeared underutilized (only used in 16% of our patient population).

Previous history of HDP and gestational diabetes were more common in patients with IBD who developed HPD.

Table 1 Demographics, medical co-morbidities, and IBD disease status by status of hypertensive diseases of pregnancy (N=100)

	Hypertensive Disorder of Pregnancy: No (N=78)	Yes (N=22)	P-value
Age (years) at delivery, Mean (SD)	33.9 (4.1)	36.3 (5.1)	0.06[1]
Multiparity, n (%)	36 (46.2%)	6 (27.3%)	0.11[2]
Race, n (%)			0.63[2]
White	41 (52.6%)	14 (63.6%)	
Latinx	12 (15.4%)	4 (18.2%)	
Asian	6 (7.7%)	2 (9.1%)	
Black	3 (3.8%)	0 (0.0%)	
Other	16 (20.5%)	2 (9.1%)	
Pre-Pregnancy Obesity, n (%)	17 (21.8%)	7 (31.8%)	0.33[2]
cfDNA Days, Mean (SD)	78.7 (9.5)	81.2 (7.4)	0.16[1]
cfDNA Fetal Fraction, Mean (SD)	10.3 (3.8)	8.0 (2.5)	0.01[1]
History of chronic HTN, n (%)	2 (2.6%)	1 (4.5%)	0.63[2]
History of HDP, n (%)	2 (2.6%)	5 (22.7%)	<.01[2]
LDA use, n (%)	11 (14.1%)	5 (22.7%)	0.33[2]
In vitro fertilization, n (%)	7 (9.1%)	5 (22.7%)	0.08[2]
Smoking, n (%)			0.34[2]
Current	1 (1.3%)	0 (0.0%)	
Quit	6 (7.9%)	0 (0.0%)	
Never	69 (90.8%)	22 (100.0%)	
Diagnosis, n (%)			0.52[2]
Crohn's disease	27 (34.6%)	6 (27.3%)	
UC	51 (65.4%)	16 (72.7%)	
Clinical Remission at conception, n (%)	67 (85.9%)	19 (86.4%)	0.86[2]
Gestational Diabetes, n (%)	3 (3.8%)	4 (18.2%)	0.02[2]

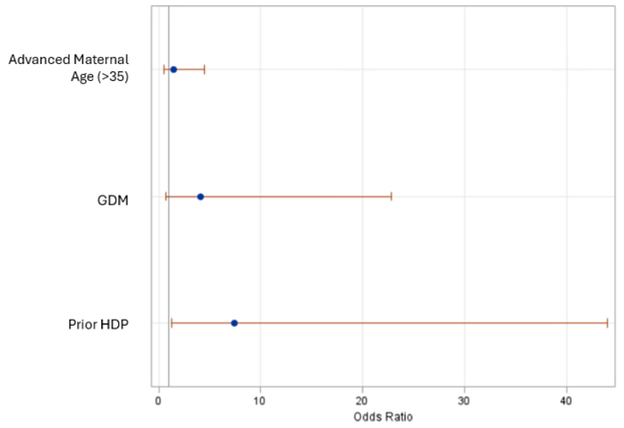
[1]Kruskal-Wallis p-value; [2]Chi-Square p-value;

Table 2 Pregnancy outcomes by status of hypertensive diseases of pregnancy (N=100)

	Hypertensive Disorder of Pregnancy: No (N=78)	Yes (N=22)	P-value
Preterm labor or PROM, n (%)	0 (0.0%)	5 (22.7%)	<.01[2]
Maternal Length of Stay, Mean (SD)	2.6 (1.3)	3.5 (1.4)	<.01[1]
Delivery Method, n (%)			0.05[2]
Vaginal	59 (75.6%)	12 (54.5%)	
Cesarean	19 (24.4%)	10 (45.5%)	
Postpartum hemorrhage, n (%)	7 (9.0%)	4 (18.2%)	0.22[2]
Chorioamnionitis or endometritis, n (%)	6 (7.7%)	3 (13.6%)	0.39[2]
Birthweight (grams), Mean (SD)	3393.0 (526.4)	3099.3 (478.4)	<.01[1]
Birthweight < 10th percentile, n (%)	7 (9.0%)	1 (4.5%)	0.50[2]
NICU Admission, n (%)	5 (6.5%)	2 (9.1%)	0.68[2]

[1]Kruskal-Wallis p-value; [2]Chi-Square p-value;

Figure 1. Multivariate analysis for predictors of hypertensive disorders of pregnancy (N=100)



After multivariate analysis was performed, the only significant predictor of developing HDP was **previous history of HDP**.

- **Limitations:** Small sample population, low incidence of other possible risk factors.
- **Next step:** Further studies to determine the risk-benefit ratio of LDA use in pregnancies with IBD.

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