Areas for improvement in pre-eclampsia prevention: aspirin use in indicated pregnancies

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“you cannot have maternal health without reproductive health” | HC

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Background

- Hypertensive disorders of pregnancy are leading causes of maternal and fetal morbidity and mortality
  - Gestational hypertension
  - Pre-eclampsia with and without severe features
  - HELLP syndrome
  - Eclampsia
- Significant healthcare costs associated, largely related to NICU costs associated with prematurity

Maternal	Fetal
Seizure	Preterm delivery
Stroke	IUGR
Myocardial infarction	Placental abruption
Pulmonary edema	IUFD
Hepatic injury	
Renal injury	
Hemorrhage	
Death	

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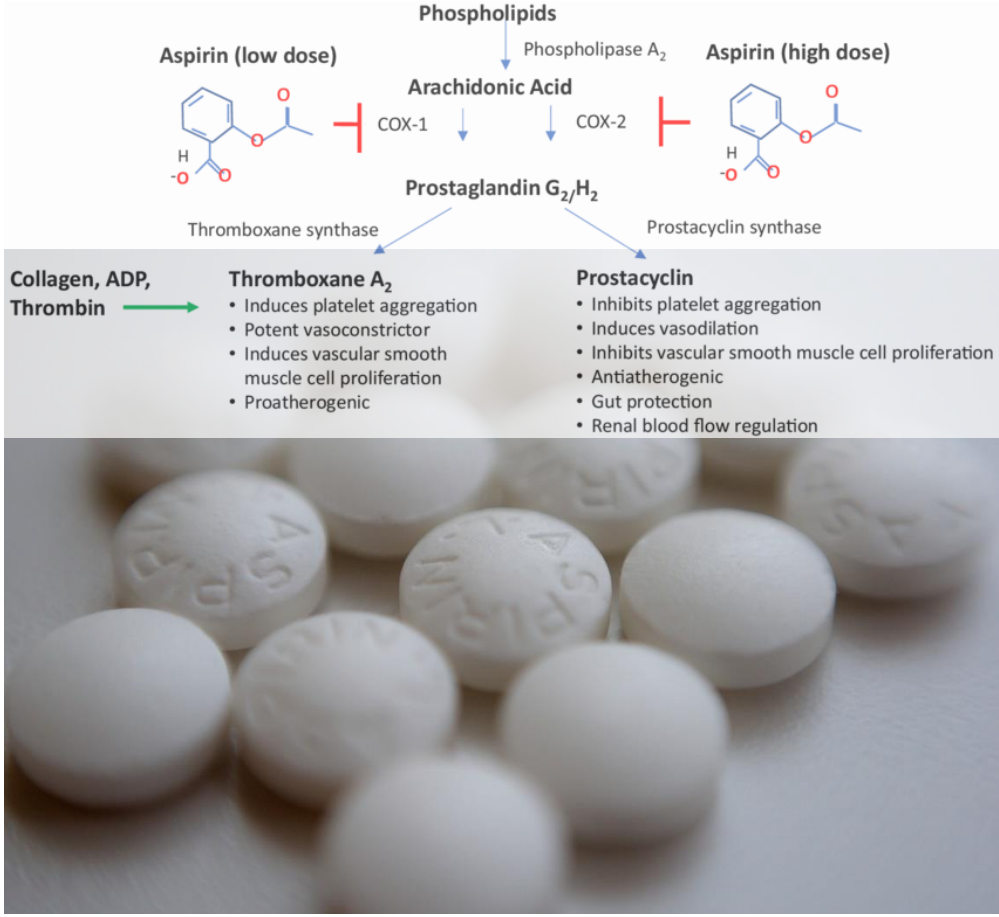
Aspirin in pregnancy

- The exact mechanism by which ASA decreases risk of pre-eclampsia is unknown
  - Pre-eclampsia associated with ↓ prostacyclin and ↑ thromboxane A2
  - Aspirin is a COX-1 inhibitor that lowers the ratio of TXA2:prostacyclin
- Low-dose ASA may reduce the development of pre-eclampsia by 10-25% in at-risk pregnancies



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Aspirin guidance

- ACOG, USPSTF, WHO, and NIH have provided varying guidance on aspirin use for pre-eclampsia prevention since 2011
- ACOG and SMFM jointly published clear guidelines in 2018
  - Dosage: 81 mg
  - Timing of initiation and duration: 12-28w to delivery
  - Patient risk stratification: high, moderate, low risk
- Use of low-dose ASA in practice is highly variable

Table 1. Clinical Risk Assessment for Preeclampsia*

Risk Level	Risk Factors	Recommendation
High†	• History of preeclampsia, especially when accompanied by an adverse outcome • Multifetal gestation • Chronic hypertension • Type 1 or 2 diabetes • Renal disease • Autoimmune disease (systemic lupus erythematosus, antiphospholipid syndrome)	Recommend low-dose aspirin if the patient has one or more of these high-risk factors
Moderate‡	• Nulliparity • Obesity (body mass index greater than 30) • Family history of preeclampsia (mother or sister) • Sociodemographic characteristics (African American race, low socioeconomic status) • Age 35 years or older • Personal history factors (eg, low birthweight or small for gestational age, previous adverse pregnancy outcome, more than 10-year pregnancy interval)	Consider low-dose aspirin if the patient has more than one of these moderate-risk factors§
Low	• Previous uncomplicated full-term delivery	Do not recommend low-dose aspirin

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Project aims/design

- Quality improvement project with initial aims met through a retrospective chart review
  - Rates of low-dose ASA prescription in patients at moderate and high risk for pre-eclampsia
  - Relationship between provider prescribing practices and pregnancy outcomes
- Develop a protocol to improve prescribing practices

- Sample: Patients who delivered at MHUMC in 2021
- Eligible:
  - Prenatal care with MHUMC physicians
  - At least 2 prenatal visits prior to delivery
  - Initiation of prenatal care no later than 27w6d EGA
  - No contraindication to aspirin therapy

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Results

Patient characteristics

- 284 patients included in analysis
- Over ½ White, 1/3 Black
- Over 50% publicly insured
- Majority of patients from PSG with <10% each from the other care groups
- Over 2/3 of patients moderate or high risk
- Cesarean delivery rate 40%

Table 1. Patient characteristics

	Subcategory	Frequency	Percent
Race	White	153	54.4
	Black or AA	94	33.5
	Other	34	12.1
Insurance Type	Private	162	43.2
	Public	123	56.8
Prenatal Care Group	PSG	245	86.3
	WCLA	10	3.5
	HROC	25	8.8
	FM	4	1.4
Risk Category	Low	91	31.9
	Moderate	126	44.2
	High	68	23.9
Delivery Mode	Vaginal	169	59.3
	Cesarean delivery	116	40.7

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Results

Aspirin prescribing practices

- About 1/3 of all high-risk patients were not prescribed aspirin
- The care group most likely to prescribe aspirin to high-risk patients was the Maternal-Fetal Medicine group (HROC)
- Approximately 1/3 of the patients within the moderate risk category were prescribed aspirin

Table 2. Aspirin prescribing practices by Prenatal Care Group

Risk Category	Aspirin Prescribed	Frequency (%)		
		PSG	WCLA	HROC
High	Yes	32 (69.6)	2 (66.7)	16 (88.9)
	No	14 (30.4)	1 (33.3)	2 (11.1)
Moderate	Yes	39 (33.9)	2 (40)	1 (25)
	No	76 (66.1)	3 (60)	3 (75)
Low	Yes	1 (1.2)	0 (0)	0 (0)
	No	83 (98.8)	2 (100)	3 (100)

*P values not reported as not statistically significant

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Results

Risk of HTN based on prescribing practices

- Regardless of aspirin prescription, over 50% of high risk patients developed a hypertensive disorder
- The benefits of aspirin prescription for the moderate risk group were not borne out in this study

Table 3. Risk of developing a hypertensive disorder by risk category and aspirin prescription

Risk category	Aspirin Prescribed	Hypertensive disorder diagnosis Frequency (%)	
		Yes	No
High	Yes	28 (54.9)	23 (45.1)
	No	8 (50)	8 (50)
Moderate	Yes	9 (22.5)	31 (77.5)
	No	2 (2.4)	81 (97.6)
Low	Yes	0 (0)	1 (100)
	No	5 (5.6)	84 (94.4)

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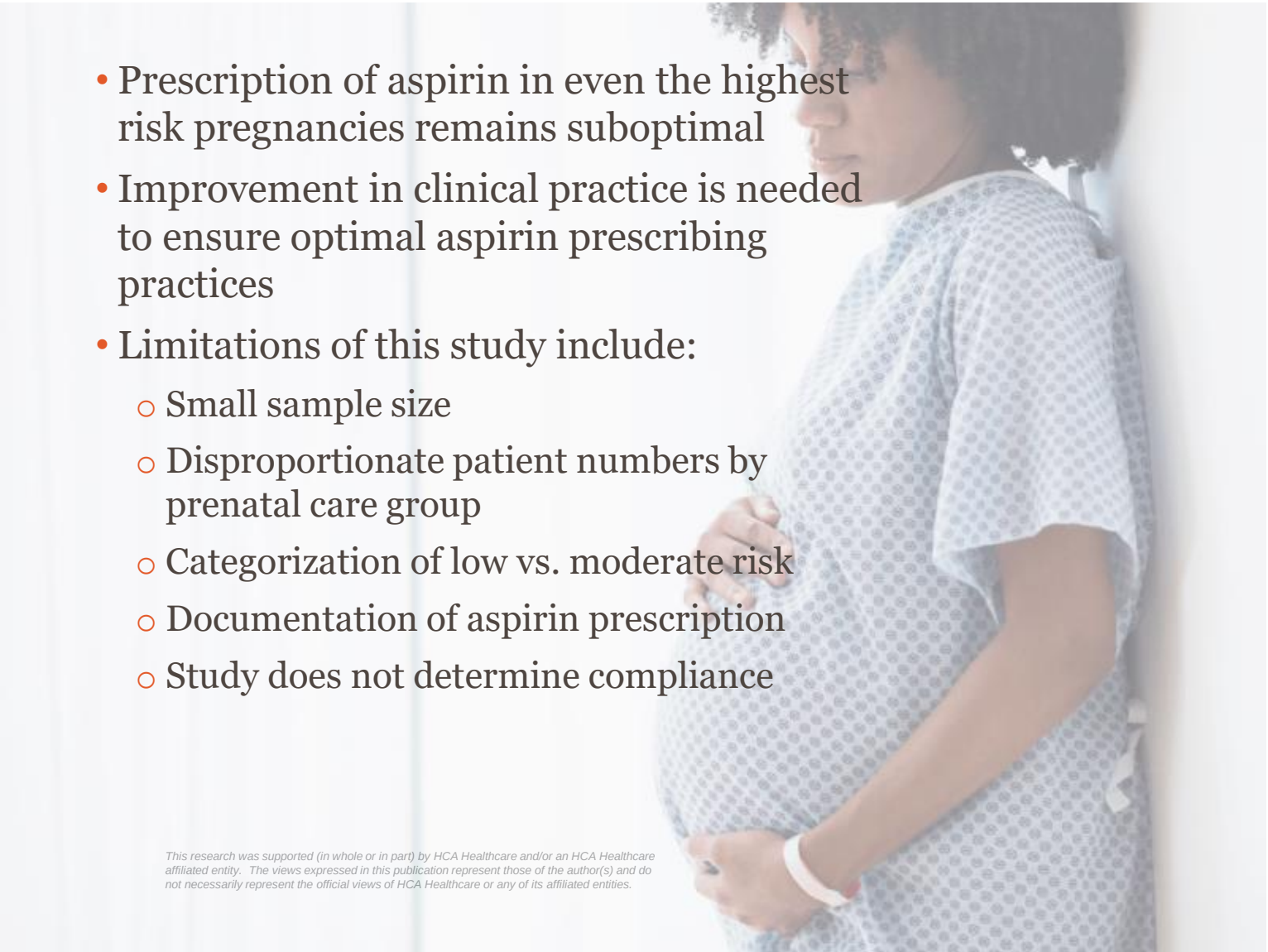
Conclusions



- Prescription of aspirin in even the highest risk pregnancies remains suboptimal
- Improvement in clinical practice is needed to ensure optimal aspirin prescribing practices
- Limitations of this study include:
  - Small sample size
  - Disproportionate patient numbers by prenatal care group
  - Categorization of low vs. moderate risk
  - Documentation of aspirin prescription
  - Study does not determine compliance

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Future Directions

- Continue data collection for all those delivered at MHUMC in 2021 (3,192 patients)
- Development of a clinical tool such as an Epic build-in to flag high risk patients
- Standardize aspirin prescription documentation and practices
- Determine aspirin compliance in moderate and high-risk pregnancies

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Questions?

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