Tetrahydrocannabinol Use in Pregnancy and Risk of Preterm Birth

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Introduction

• Incidence of marijuana use among reproductive age females continues to rise as states legalize marijuana.

• In young, socioeconomically disadvantaged women, studies report up to 15% of females self-report marijuana use in their pregnancy.

• As more states legalize marijuana, it becomes even more vital to clearly identify the fetal risks involved with marijuana use in pregnancy.

• The literature is limited by lack of data on confounding factors (such as concurrent tobacco use, alcohol use, or other illicit drug use) and use of self-reported surveys instead of urine drug screen data.

• After modeling to adjust for covariates, there are conflicting conclusions as to whether or not marijuana use in pregnancy increases the risk of preterm birth.

• There is poor consensus on the contribution of frequency of marijuana use or timing of marijuana use on gestational age in pregnancy.

STUDY AIM: Evaluate whether maternal THC use during pregnancy increases the risk of spontaneous preterm births in a South-Central Louisiana population.

Methods

• We conducted a retrospective cohort study of deliveries at Woman's Hospital, Baton Rogue, Louisiana, USA from January 2016 through October 2017 (n=7,065).

• Our *exposure* was a positive urine drug screen (UDS) test for THC during pregnancy.

• Our *primary outcome* was spontaneous preterm birth (PTB) defined as delivery prior to 37 weeks gestation without medical induction.

• Categorical covariate distribution was compared between preterm birth and THC use groups using a Fisher exact test, while a t-test was used to compare means between groups.

• *Multivariable logistic regression* was performed to determine if marijuana use was associated with an increased risk of preterm birth, adjusting for potential confounders: education, race, ethnicity, smoking status, alcohol use, gestational diabetes, preeclampsia/eclampsia/ HELLP, previous preterm delivery, any other positive drug use, maternal age, maternal BMI, and private insurance status.

• *Bayesian variable selection* for the multivariable logistic regression was performed to obtain a data-driven marginal posterior probability of importance (MPPI) for each covariate in predicting PTB. Higher (lower) values indicate that covariate has a large (small) impact on preterm birth risk.

Results

• 16.3% (n= 1,149) of patients tested positive for THC via UDS during pregnancy.

• THC+ patients were less likely to have above a high school education, be Hispanic, and use private insurance. They were younger, more likely to be Black, and use concomitant substances, particularly tobacco and alcohol.

• THC+ patients had significantly higher rate of spontaneous PTB (17.1% vs 13.5%, p=0.002).

• After adjusting for potential confounders, marijuana use was no longer a significant predictor of spontaneous PTB (adjusted odds ratio 1.12, 95% CI 0.93-1.35, p-value = 0.235) (Figure 1).

• However, other factors were found to independently increase PTB risk in our cohort including smoking status, gestational diabetes, hypertensive disorders of pregnancy, history of PTB, other drug use, and increased maternal age (Figure 1).

• Hispanic ethnicity and increased BMI were associated with decreased odds of PTB (Figure 1).

Figure 1

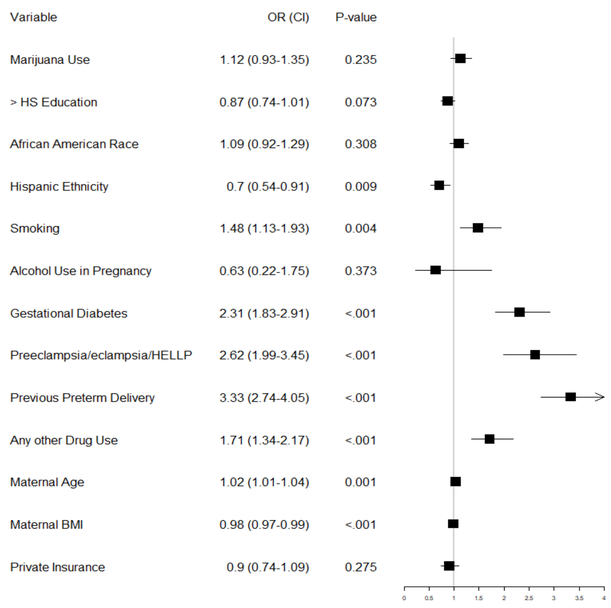

Figure 1: Multivariable Logistic regression results for odds of preterm birth Forest plot for the multivariable logistic regression model predicting preterm birth. After adjusting for other potential confounders for marijuana use, marijuana use was no longer a significant predictor of preterm birth (adjusted odds ratio, aOR=1.12, 95% CI = 0.93-1.35, p-value=0.235).

Table 1

Variable	Prob of inclusion =.25	Prob of inclusion = .50	Prob of inclusion = .75
Marijuana Use	0.038	0.16	0.393
> HS Education	0.046	0.214	0.564
African American Race	0.044	0.106	0.289
Hispanic Ethnicity	0.489	0.647	0.912
Smoking	0.47	0.741	0.93
Alcohol Use in Pregnancy	0.248	0.377	0.639
Gestational Diabetes	1	1	1
Preeclampsia/eclampsia/HELLP	1	1	1
Previous Preterm Delivery	1	1	1
Any other Drug Use	0.943	0.999	1
Maternal Age	0	0.849	0.7
Maternal BMI	1	0.824	1
Private Insurance	0.052	0.188	0.381

Table 1: Marginal posterior probabilities of importance for predicting preterm birth. Three results are shown in order to investigate sensitivity of conclusions to prior specifications. Table indicates that marijuana use in pregnancy is one of the least important factors in predicting preterm birth out of those considered in figure 1 and table 2. At most, the marginal probability of importance was 0.393, when many other covariates had MPPI > 0.90.

Conclusions

- Without adjustment, THC use during pregnancy is associated with a higher rate of spontaneous PTB.
- When controlling for confounders such as concomitant substance use, history of preterm birth, diabetes, preeclampsia/eclampsia, HELLP syndrome, the relationship between preterm delivery and maternal marijuana use was no longer statistically significant. Additional analyses indicate marijuana could be one of the least predictive factors in PTB among our patient population.

References

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