Increased incidence of small for gestational age (SGA) neonates in pregnant women using cannabis.

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Introduction

The Women And Newborn Drug and Alcohol Service (WANDAS) provides a state-wide referral service within WA for pregnant women with significant alcohol or other drug use in pregnancy. For women who report using cannabis, care is provided for women using more than 10 to 15 cones daily.

Our cohort of women face numerous negative social determinants of health such as financial, housing and food insecurity; trauma and domestic violence; which result in them being vulnerable to the use of drugs and alcohol, including during pregnancy.

A 2022 meta-analysis showed cannabis use in pregnancy has a risk ratio of 1.61 for small for gestational age (SGA) (<5th centile), and a risk ratio of 2.06 for a neonates of <2500g[1]. According to the AIHW, 9% of live-born babies in Australia in 2017 were SGA (<10th centile) and 6.7% were of low birthweight (less than 2,500 grams)[2].

Aims

We sought to estimate the incidence of SGA neonates in this pregnancy cohort and to investigate which of the numerous risk factors in this population were more strongly associated with SGA neonates.

Methods

We performed a retrospective audit with GEKO approval from the KEMH HREC. Data were collected from 426 women attending the WANDAS clinic over a two year period between January 2018 and December 2019. Variables included maternal age, parity, current smoking, alcohol consumption, use of other drugs (either individually or combined), antenatal complications, gestation at delivery, mode of birth, birth weight and Apgar scores at 1,7 and 10 minutes.

Neonates were defined as SGA as <10th centile, appropriate for gestational age (AGA) as 10th - 90th centile and large for gestational age (LGA) as >90thcentile.

Recursive partitioning methods, with cross validation, were used to identify simultaneous characteristics associated with high likelihood of SGA. Once covariates were identified, logistic regression was used to determine the odds ratio of SGA relative to the sub-population with the lowest risk of SGA. P-values of <0.05 were used to indicate statistically significant associations with SGA.

Results

Current reported use of cannabis (relative to none) was associated with an increased likelihood of SGA neonates (OR=1.67, 95% CI 1.09-2.57, p=0.020) and an increased likelihood of preterm birth (OR=1.69, CI 1.56-4.08, p=0.04). Current cannabis use significantly increased the likelihood of Apgar scores <7 at 5 minutes (OR=4.64, 95% CI 1.26-17.09, p=0.024). There was no association between cannabis use and mode of delivery. Cohort characteristics are shown in Table 1.

Table 1: Demographic history, drug use and birth outcomes: stratified by SGA/LGA/AGA

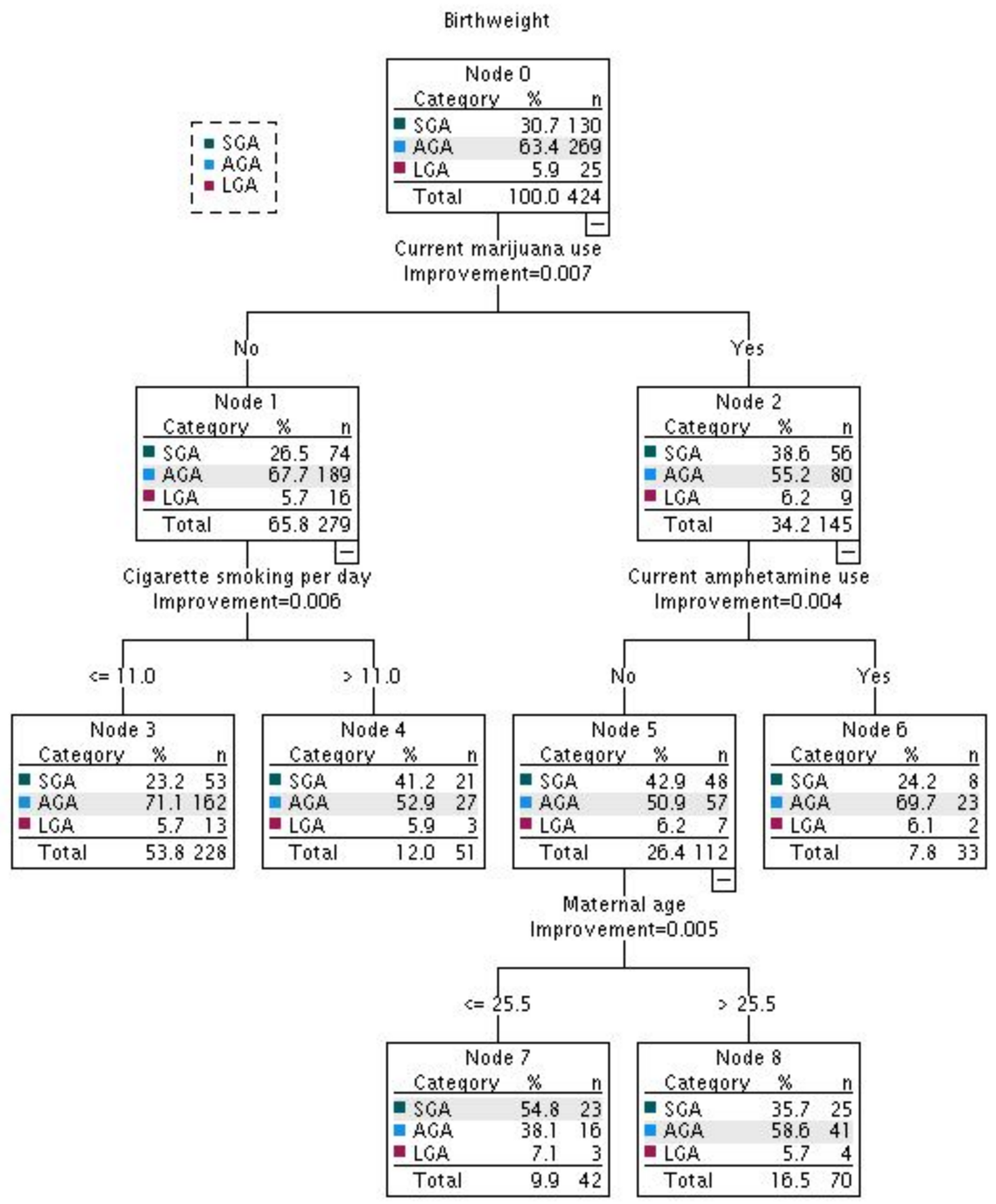
	SGA N=130	AGA/LGA n=294	p-value
Age (y)	30 (25-35; 19-46)	30 (26-35; 20-45)	0.375
Ethnicity			
Caucasian	72 (55.4%)	153 (52.0%)	0.309
ATSI	51 (39.2%)	112 (38.1%)	
Other	7 (5.4%)	29 (9.9%)	
Parity	2 (0-3; 0-9)	2 (1-3; 0-10)	0.681
Nulliparous	34 (26.2%)	72 (24.5%)	0.715
Diabetes			
No	89 (68.5%)	189 (64.3%)	0.203
GDM/diabetes	8 (6.2%)	35 (11.9%)	
Unknown	33 (25.4%)	70 (23.8%)	
Current smoker	92 (71.3%)	208 (70.7%)	0.905
Cigarettes/day	10 (5-15; 1-40)	5 (0-10; 0-40)	0.255
Alcohol	21 (16.2%)	30 (10.2%)	0.082
Drug history	4 (3.1%)	23 (7.8)	0.056
Current drug use	116 (89.2%)	251 (84.5%)	0.065
Marijuana	**56 (43.1%)**	89 (30.3%)	**0.010**
Amphetamine	47 (36.2%)	122 (41.5%)	0.300
Opioid	0 (-)	8 (2.7)	0.113
Opioid treatment	8 (6.2%)	36 (12.2)	0.058
Prescription	2 (1.5%)	9 (3.1%)	0.515
Poly drug use	13 (10.0%)	25 (8.5%)	0.619
Birth outcomes			
GA at birth (w)	37.3 (36.0-38.3; 24.3-40.6)	38.0 (37.1-38.7; 30.7-41.6)	<0.001
Preterm <37w	**49 (37.7%)**	59 (20.1%)	**<0.001**
Mode of delivery			
Spontaneous vaginal	79 (61.2%)	187 (63.6%)	0.270
Assisted vaginal	6 (4.7%)	25 (8.5%)	
Emergency CS	23 (17.8%)	36 (12.2%)	
Elective CS	21 (16.3%)	46 (15.6%)	
Any CS	44 (34.1%)	82 (27.9%)	0.198
Apgar <7 at 1 min	23 (18.1%)	41 (14.0%)	0.287
Apgar <7 at 5min	6 (4.7%)	6 (2.1)	0.198

Data shown as median (interquartile range; range or n(%) as appropriate

Predictors associated with SGA neonates included: cigarette smoking, cannabis use, amphetamine use and current opioid treatment.

Of the women in our cohort who reported cannabis as the main drug used, 43% had babies with SGA birth weights. The group of women in our cohort who were most at risk of having an SGA neonate were those who were smoking cannabis, but were not using amphetamines and who were also <25 years of age. 54.8% of this cohort had SGA neonates (OR=4.00, 95% CI 2.02-7.90, p=0.000), see Figure 1.

Figure 1: recursive partitioning model 1. Simultaneously considering maternal age, nulliparity, GDM and pre-existing diabetes, cigarette smoking (number of cigarettes), alcohol (any vs none), current cannabis use, amphetamines, other opioids, polydrug use, prescription drugs, and opioid treatment.



Discussion

We hypothesise that the higher rates of SGA in women using marijuana but not using amphetamines likely signifies a dose dependent relationship to the amount of cannabis used. It is unclear whether these women are using larger quantities of cannabis, or if the composition of cannabis products has changed. There is evidence that the potency of cannabis products has increased in the last two decades, which may contribute to a relative increased dose effect[3,4,5].

Limitations to our study include small numbers in subgroups of recursive partitioning analysis. Other potential confounding factors that were not available for analysis include BMI and other negative social determinants of health, such as family violence which has been shown to almost triple the rate of low birthweight neonates compared with women not experiencing family violence in pregnancy[6]

Conclusion

There is an increase in SGA among pregnant women using cannabis, especially in women <25 years of age. In this cohort 43% and 54.8% respectively had babies with birth weights below 10th centile, which is more than 4 times the national rate of SGA neonates. We recommend that women who report active heavy cannabis use in pregnancy be classified as high risk and should receive monitoring for fetal growth restriction.

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Conflicts of interest – none declared.