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Background

➤ Approximately one in five Canadians report smoking tobacco



- Smoking is associated with cancers, cardiovascular disease and premature mortality
- Smoking is also an established risk factor for adverse pregnancy outcomes, including preterm delivery and intrauterine growth restriction
- Most cohort studies collect information on smoking using self-report data:
 - ❖ Depending on the social context, the stigma associated with smoking may lead to underreporting and possible bias in studies relying on self-reported data
- In many studies, self-reported smoking is used as a key variable in analysis of clinical outcomes yet has been questioned as a valid reflection of actual smoking rates.

Objective

To evaluate concordance between self-reported smoking and concentrations of plasma cotinine, a biomarker of smoking, among participants enrolled in two related cohorts:

1. Pregnant women living with HIV (LWH) or not enrolled in the Children and Women: Antiretrovirals and Markers of Aging (CARMA)-PREG cohort,
2. Women and men LWH or not enrolled in the CARMA-CORE cohort.



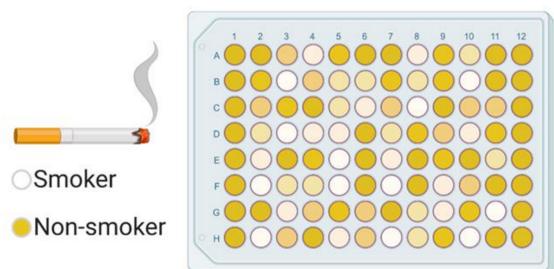
Methods

Cotinine, a nicotine metabolite with a ~16h half-life in plasma, was measured by ELISA in:

- Third trimester plasma specimens from pregnant women in CARMA-PREG (76 LWH and 24 controls)
- Plasma from men and non-pregnant women in CARMA-CORE (43 LWH and 57 controls)

Smoking Intensity:

- **Heavy:** a pack a day or more
- **Moderate:** 2 to 19 cigarettes a day
- **Light:** Less than 2 cigarettes a day



It is possible to obtain reliable and robust self-reported smoking data

Results

Table 1. Demographic, clinical, and substance use characteristics of the study participants from two separate cohorts self-reporting tobacco smoking at their study visit, or not.

	CARMA-PREG			CARMA-CORE		
	Smokers (n=43)	Non-Smokers (n=57)	p-value	Smokers (n=50)	Non-Smokers (n=50)	p-value
Age (years)	31 ± 5 (17-42)	33 ± 5 (21-45)	0.138	42 ± 9 (17-75)	38 ± 16 (17-75)	0.132
Weeks of Gestation at Visit^a	34 ± 2 (30-38)	34 ± 2 (28-38)	0.854			
Female sex	43 (100)	57 (100)	1.000	25 (50)	26 (52)	1.000
Smoking intensity						
Heavy	3 (7)			7 (14)		
Moderate	28 (65)			29 (58)		
Light	3 (7)			11 (22)		
No intensity data	9 (21)			3 (6)		
Study site			0.284			
Vancouver	38 (88)	54 (95)		50 (100)	50 (100)	
Montreal	5 (12)	3 (5)				
Ethnicity			<0.001			<0.001
White	19 (44)	26 (46)		25 (50)	20 (40)	
African Caribbean Black Indigenous	2 (5)	15 (26)		3 (6)	3 (6)	
Asian / Other	3 (7)	12 (21)		2 (4)	19 (38)	
Income < \$15,000 CAD /year^a	31 (74)	17 (30)	<0.001	37 (77)	10 (23)	<0.001
HIV+ Status	37 (86)	39 (68)	0.058	25 (50)	18 (36)	0.225
Substance Use						
Illicit Drugs ^b	23 (54)	4 (7)	<0.001	22 (44)	3 (6)	<0.001
Alcohol	17 (40)	16 (28)	0.284	27 (54)	36 (72)	0.097
Cannabis ^a	9 (21)	6 (11)	0.168	21 (42)	8 (16)	0.008

Data are presented as mean ± SD (range) or n (%). Fisher's exact test and Student's t-test used.
^aData was missing for the following groups CARMA-PREG smokers; CARMA-PREG non-smokers; CARMA-CORE smokers; CARMA-CORE non-smokers for weeks of gestation at visit n=0; 3; N/A; N/A, income <\$15,000 CAD/year n=1; 1; 2; 6, illicit drug use n=0; 0; 0; 1, and cannabis use n=0; 0; 0; 1.
^bIllicit drugs includes cocaine, heroine, crack, and methamphetamine.

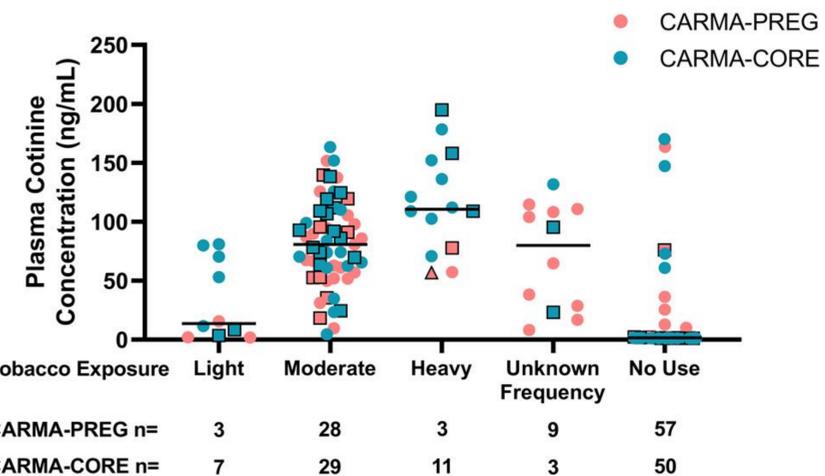


Figure 1. Plasma cotinine concentration according to self-reported intensity of smoking since last visit. Horizontal bar represents median cotinine. The one participant who chewed rather than smoked tobacco is indicated by a triangle, and the participants who used cannabis are indicated by squares.

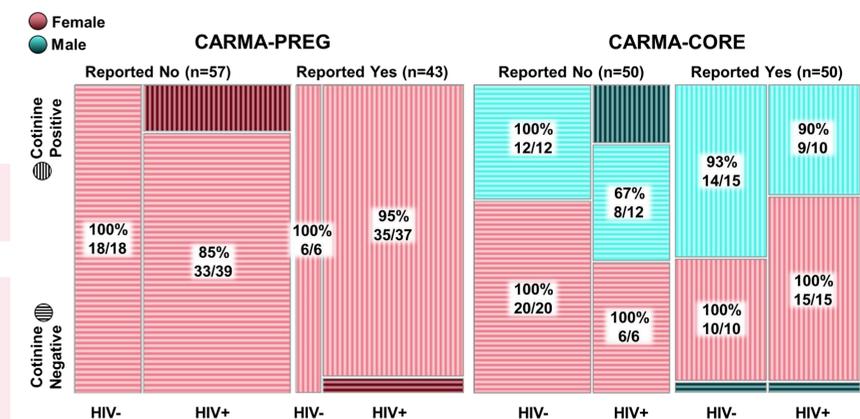


Figure 2. Concordance between self-reported smoking at study visit and plasma cotinine concentration measured by ELISA on a plasma specimen collected on the day of visit in the CARMA-PREG and CARMA-CORE cohorts. Discordance is represented by the darker shading.

Conclusions

CARMA-PREG: The Cohen's κ was 0.839, indicating almost perfect agreement between self-reported data and plasma cotinine values. The sensitivity and specificity of self-reporting were 87% and 96%, respectively.

CARMA-CORE: The Cohen's κ was 0.880, indicating almost perfect agreement. The sensitivity and specificity of self-reporting were 92% and 96%, respectively.

The odds of discordance between self-reported smoking status and cotinine levels were not significantly different between self-reported smokers and non-smokers, nor between pregnant women and others.

Taken together, the overall concordance between plasma cotinine and self-reported data among all participants was 94% with a sensitivity and specificity of 90% and 96%, respectively

Significance

Reliable self-reported smoking data is important to account for smoking status in cohort studies.

Our results suggest that future studies should ensure a safe and non-judgemental setting for study participants, to obtain accurate and robust self-report data.

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