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# Dietary Patterns and Impact on Cardiovascular Disease Risk in People Living with HIV

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## Introduction

People living with HIV (PLWH) have twice the risk of cardiovascular disease (CVD) compared to the general population with data on dietary intake, a measure of socioeconomic status and a contributor to CVD risk, limited in PLWH.

We aimed to investigate differences in dietary intake, calculated by food frequency questionnaire (FFQ), between PLWH and CVD-risk matched controls and examine associations between HIV and subclinical CVD measured by coronary CT angiography (CCTA), adjusting for these differences.

## Methods

The UPBEAT CAD substudy, examining CVD risk in PLWH, enrolled participants with and without HIV from the UPBEAT study, a prospective, longitudinal cohort study with over 10 years follow up.

Participants were over 40 years with no CVD history and were matched on HIV status and CVD risk factors.

Participants underwent a FFQ and CCTA to assess for subclinical CVD. Nutritional data were calculated using Nutritics dietetics software (Dublin 2020).

Between-group comparisons and associations between variables and subclinical CVD were calculated using Mann Whitney U test and logistic regression respectively.

## Results

99 people were enrolled in the substudy. Median age was 49 years, 73.5% were male and 22.4% were current smokers.

PLWH were more likely unemployed and to earn less than HIV negative controls. HIV negative controls were more likely to have a family history of CVD (see table 1)

For PLWH, median CD4+ count was 710 cells/cm<sup>3</sup> (575.75, 916), median duration of ART was 10 years. 8% had a history of injecting drug use and 47% of HIV transmissions were through homosexual contact.

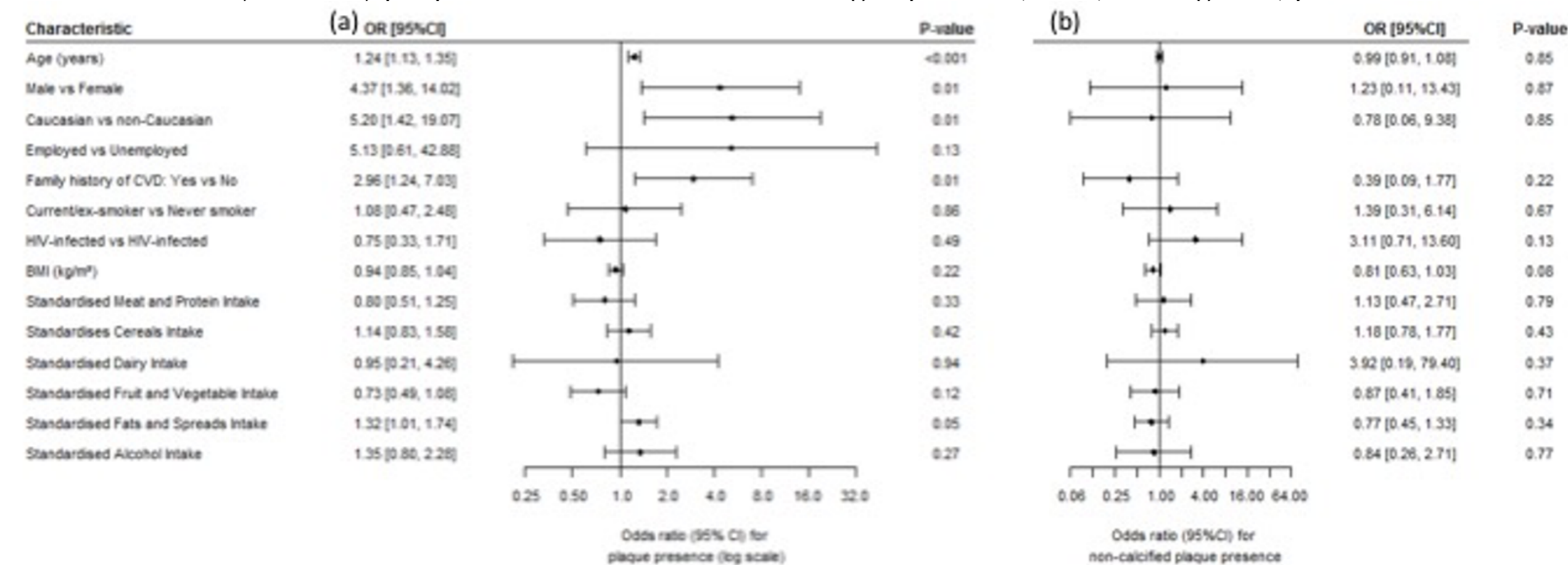
**Table 1. between group comparison on dietary intake and demographics based on HIV status**

	HIV Positive	HIV Negative	P value
N (%)	51	48	
Age, median (IQR)	49.1 (45.2, 59)	50.1 (46.2, 55.5)	0.67
Male	38 (74.5%)	34 (70.8%)	0.68
Non-Caucasian	13 (25.5%)	11 (22.9%)	0.77
Income Above €26,000	34 (68%)	41 (89.1%)	<b>0.012</b>
Unemployed	9 (17.6%)	2 (4.2%)	<b>0.033</b>
Family Hx of CVD	19 (37.3%)	28 (58.3%)	<b>0.036</b>
Current Smokers	11 (21.6%)	11 (22.9%)	0.79
BMI, mean (SD)	28.3 (4.91)	27.9 (4.29)	0.73
Systolic BP, median (IQR)	133.5 (125, 142.8)	135 (127, 154)	0.17
Diastolic BP, median (IQR)	81.5 (74, 88)	84 (80, 91)	0.05

**Table 2. between group comparison of daily dietary intake**

	HIV Positive	HIV Negative	P value
Kcal	2234 (1821, 3139)	2371 (1739, 2942)	0.842
Carbohydrates (g)	245.75 (165.73, 353.1)	210.55 (158.84, 323.78)	0.456
Sugars (g)	111.18 (74.23, 170.62)	111.48 (70.58, 141.26)	0.369
Fibre (g)	27.54 (21.55, 38.94)	28.2 (17.53, 41.03)	0.848
Saturated Fats (g)	32.55 (21.67, 44.9)	29.7 (22.55, 34.45)	0.539
Polyunsaturated Fats (g)	12.06 (9.82, 19.23)	13.6 (8.73, 17.64)	0.684
Trans Fats (g)	1.43 (0.97, 1.91)	1.33 (1.08, 1.66)	0.628
Cholesterol (g)	304.03 (215.7, 420.92)	392.2 (205, 407.16)	0.607
Protein (g)	93.23 (83.77, 141.64)	127.21 (98.85, 181.37)	<b>0.043</b>
Alcohol (g)	4 (0.02, 13.48)	8.9 (2.86, 15.39)	<b>0.035</b>
Caffeine (mg)	382.76 (235, 1197.91)	3325.42 (123.04, 18633.05)	<b>0.049</b>

Based on FFQ, PLWH had less daily intake of protein, caffeine, and alcohol than HIV negative controls. There was no difference in total daily calorie, carbohydrate, sugar, fibre, cholesterol and fat intake between groups (see table 2). Prevalence of any coronary plaque was similar between the two groups (PLWH; 33%, HIVneg 40%, p=0.494).



**Figure 1: Relationship between Dietary Intake and (a) total coronary plaque and (b) non-calcified plaque**

On univariate analysis comprising the whole cohort, there was no association between either food group intake (see figure 1) or HIV status with presence of total plaque (OR 0.75 [95% CI 0.329, 1.711]) or non-calcified plaque [OR 3.1 (95% CI 0.712, 13.6) p=0.132].

## Results continued

Adjusting for difference in dietary intake between the two groups, HIV status remained not associated with either total plaque (OR 0.874 [95% CI 0.351, 2.181]) or non-calcified plaque (OR 0.474 (95% CI 0.100, 2.255))

## Conclusion

These results, the first to examine dietary impact on CAD risk in PLWH, suggest differences in dietary intake may not impact CAD risk in PLWH.

Although PLWH has significantly less protein intake than uninfected controls they also had significantly less caffeine and alcohol intake compared to matched controls, adjusting for these differences did not significantly affect the relationship between HIV and subclinical CAD.

Further studies are necessary to examine the differences in dietary patterns in PLWH and assess their role in CVD risk in this population.

## Limitations

Use of once off FFQ to report dietary pattern may not accurately reflect day to day dietary intake. This cohort of participants were drawn from north inner city Dublin and as such may not reflect global dietary patterns in PLWH.

CTCA, although used to measure subclinical atherosclerotic plaque, may not reflect potential increased coagulopathy in participants which may drive CVD events such as MI in this group.

## Acknowledgements

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