The Relationship Between Lifestyle Factors and Cardiovascular Disease Risk in HIV+ Adults

FRANCES PAYNE BOLTON SCHOOL OF NURSING

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Introduction

- HIV is a chronic, manageable disease due to increased access to HIV antiretroviral medication
- People living with HIV experience almost a two-fold higher risk of cardiovascular disease (CVD), compared to non-HIV infected matched comparison groups
- Lifestyle factors (physical activity, diet, stress management, HIV medication adherence) may contribute to this increased risk
- Yet little is known about the contribution of physical activity, stress and HIV medication adherence on the CVD risk
- **Our objective** was to describe associations over time among exercise, stress, medication adherence and calculated CVD risk

Methods

Design: Secondary analysis from a single-site longitudinal cohort study in the United States

Sample: Seventy HIV+ adults, taking HIV antiretroviral therapy without diabetes were enrolled in four age (<50 years or ≥51 years) and gender (male and female) strata

Measures:

Physical Activity was assessed with a seven-day self-report physical activity diary in which subjects reported the amount, type, and intensity of each activity bout >10 minutes. In this analysis, physical activity was summed and total amount (in hours per week) was the independent variable.

Stress was assessed using the Perceived Stress Scale (Cohen, 1988). This 10-item self-report scale measures the extent to which situations in life are perceived as stressful and has repeatedly undergone psychometric testing and found to be valid and reliable (Cronbach's α = 0.78-0.91). Total scores were analyzed with higher scores indicating more perceived stress

Medication Adherence was assessed using a single item visual analog scale (0-100%) with higher scores indicating better HIV medication adherence.

CVD Risk was assessed using the Framingham 30-year risk models. Lipids and anthropomorphic measures were assessed prospectively and current medical diagnoses and medications were assessed from the subject's medical chart (with their consent).

Analysis:

- Spearman's rank order correlations were used to examine bivariate association among lifestyle variables.
- Generalized estimating equations were used to examine the associations among lifestyle factors, HIV disease characteristics, and cardiovascular risk over one year.

Results

Table 1: Baseline Sample Characteristics (n=70)

Age (Mean ± SD)	48.6 years (8.4)
Gender (frequency male)	35 (52%)
Race	
African American	59 (83%)
Caucasian	7 (10%)
Other	4 (5%)
Have other co-morbid conditions	55 (80%)
BMI (Mean ± SD)	27.5 (8.6)
Total cholesterol level (Mean ± SD)	177.8 (45.7)
HDL (Mean ± SD)	49.3 (18.1)
LDL (Mean ± SD)	104. 6 (40.1)
Triglycerides (Mean ± SD)	142.4 (69.3)
Currently smoke	35 (75%)
CD4 + T cell count (Mean ± SD)	563.3 (344.0)
CD4+ T cell Nadir (Mean ± SD)	165.0 (157.3)
Undetectable HIV Viral Load (< 200)	58 (83%)
HIV Medication Adherence (Mean ± SD)	92.5 (15.6)
Perceived Stress Scale (Mean ± SD)	17.8 (6.8)
Physical Activity (hrs/week) (Mean ± SD)	5.0 (5.7)

Figure 1: Activity patterns did not vary over time

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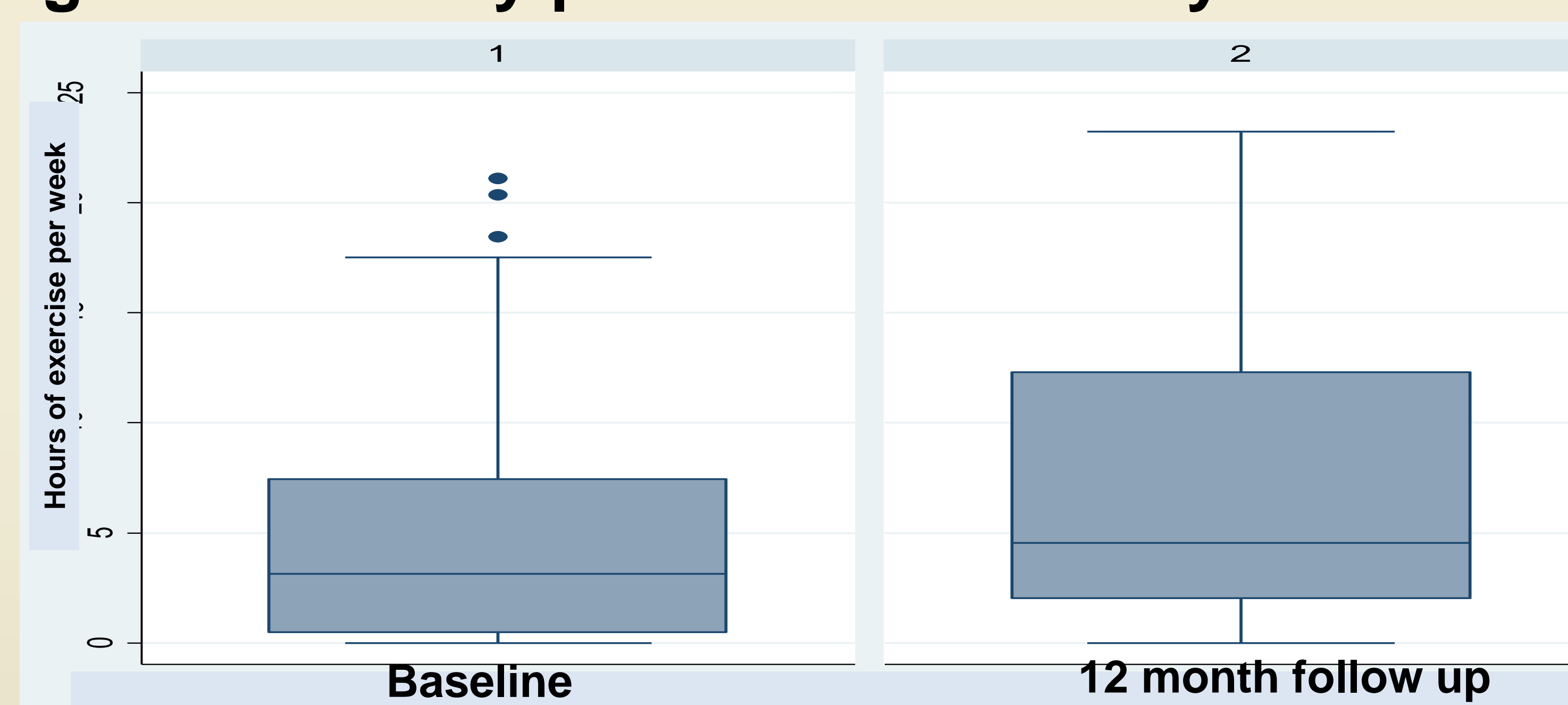
	Mean	SD	Median	Minimum	Maximum
Baseline	5.03	5.66	3.15	0	21.1
1 year	7.28	6.04	4.55	0	23.25
Total	6.04	6.08	4.0	0	23.25
				Sign Test *p* value	0.18

Table 2: There were No Bivariate Correlations Among Lifestyle Variables

	Baseline		One year later	
	HIV Medication Adherence	Perceived Stress	HIV Medication Adherence	Perceived Stress
Physical Activity	0.14 (*p*=0.30)	-0.03 (*p*=0.45)	-0.08 (p=0.60)	0.15 (p=0.30)
Perceived Stress	-0.07 (0.58)		-0.06 (p=0.61)	

Table 3: Perceived Stress was the only Lifestyle Variable Associated with Calculated Cardiovascular Disease Risk in HIV+ Adults

	Coefficient	*p*-value	95% confidence interval	
30-year Lipid-based CVD Risk Model				
Hours of Exercise per Week	0.19	0.39	-0.25	0.64
HIV Medication Adherence	-0.01	0.94	-0.19	0.18
Perceived Stress Scale	-0.87	<0.01	-1.43	-0.29
CD4 Nadir	0.00	0.90	-0.03	0.03
Undetectable Viral Load (<200)	-6.97	0.08	-14.9	0.94
				Wald χ²: 16.08
				P value: 0.007
30-year BMI-based CVD Risk Model				
Hours of Exercise per Week	0.05	0.83	-0.45	0.56
HIV Medication Adherence	0.02	0.83	-0.19	0.23
Perceived Stress Scale	-9.96	<0.01	-1.62	-0.31
CD4 Nadir	0.02	0.39	-0.02	0.05
Undetectable Viral Load (<200)	-4.58	0.32	-13.6	4.45
				Wald χ²: 10.94
				P value: 0.05

Conclusions & Limitations

- Perceived stress was the only lifestyle factor associated with calculated CVD risk over time
- This negative association between perceived stress and calculated CVD risk may be confounded by age
- This is a secondary analysis, with limited power to detect relationships among variables
- Lifestyle variables were negatively skewed owing to high HIV medication adherence and low levels of physical activity
- Additional research with more frequent assessments and more objective measures of lifestyle behavior will aid in understanding these relationships

Disclosures & Acknowledgements

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