

Objectively Measured Moderate-to-Vigorous Physical Activity is Associated With Decreased Myosteatosi

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Background

- Physically active adults across all weight categories have lower risk for cardio-metabolic disorders and less visceral adiposity
- Increased accumulation of skeletal muscle adipose tissue (i.e. myosteatosi) is now recognized as a major risk factor for cardio-metabolic disorders, independent of general obesity.
 - Myosteatosi may be an important fat depot contributing to the increased risk of cardio-metabolic disease in African ancestry populations.
 - Compared to Whites, African ancestry individuals have greater myosteatosi, while, in contrast, they have less visceral and liver adiposity.
- Studies examining the association of objectively measured physical activity and sedentary behavior with myosteatosi are lacking in African ancestry populations.

Methods



- Tobago Health Study:** Ongoing, prospective study on the Caribbean island of Tobago of >3,000 individuals of African ancestry aged 40+ recruited without regard to their health status.
- Current Preliminary Analysis:** 355 men (recruited 2014-2016) and 214 women (recruitment ongoing 2018-present), aged 50+ years
- Peripheral CT scan** at 66% of the calf length performed using the Stratec XCT-2000 (muscle density an indirect measure of intramuscular fat).
- Bodymedia SenseWear Pro** physical activity monitor used to collect physical activity data worn for 7 days.
 - Light physical activity (LPA, 1.5-3.0 METs)
 - Moderate to vigorous activity (MVPA, 3+ METs)
 - Sedentary (non-sleeping) behavior (SB) per day (1-1.5 METs)
 - Current physical activity guidelines recommend that adults get 150 minutes of MVPA per week.

Objective

Examine the association between objectively measured physical activity and sedentary behavior with skeletal muscle adipose tissue infiltration among African-Caribbeans

Results

Table 1. General Characteristics

	Men (N=355)	Women (N=214)	Age-adjusted P-Value
Age (years)	62.0 ± 6.9	59.4 ± 6.5	<.0001
BMI (kg/m ²)	28.0 ± 4.5	31.1 ± 5.5	<.0001
Waist (cm)	98.7 ± 12.5	99.4 ± 12.4	0.36
Muscle Density (mg/cm ³)	72.8 [70.1, 74.8]	71.0 [67.7, 74.3]	0.0004*
Good Health (%)	339 (95.8%)	200 (93.5%)	0.13
Current smoking (%)	104 (29.4%)	6 (2.8%)	<.0001
SB (%/day)	66.4 ± 16.0	80.1 ± 13.3	<.0001
LPA (min/day)	269.5 ± 124.4	165.1 ± 107.6	<.0001
MVPA (min/day)	40.8 [17.0, 78.8]	15.9 [5.9, 34.2]	<.0001
Met MVPA guidelines (%)	72.1%	39.3 %	<.0001
Drink >4 drinks/week (%)	13.2%	1.9%	<.0001
Obesity (%)	30.5%	56.6%	<.0001

Values are Mean± SD, Median (IQR), or %;

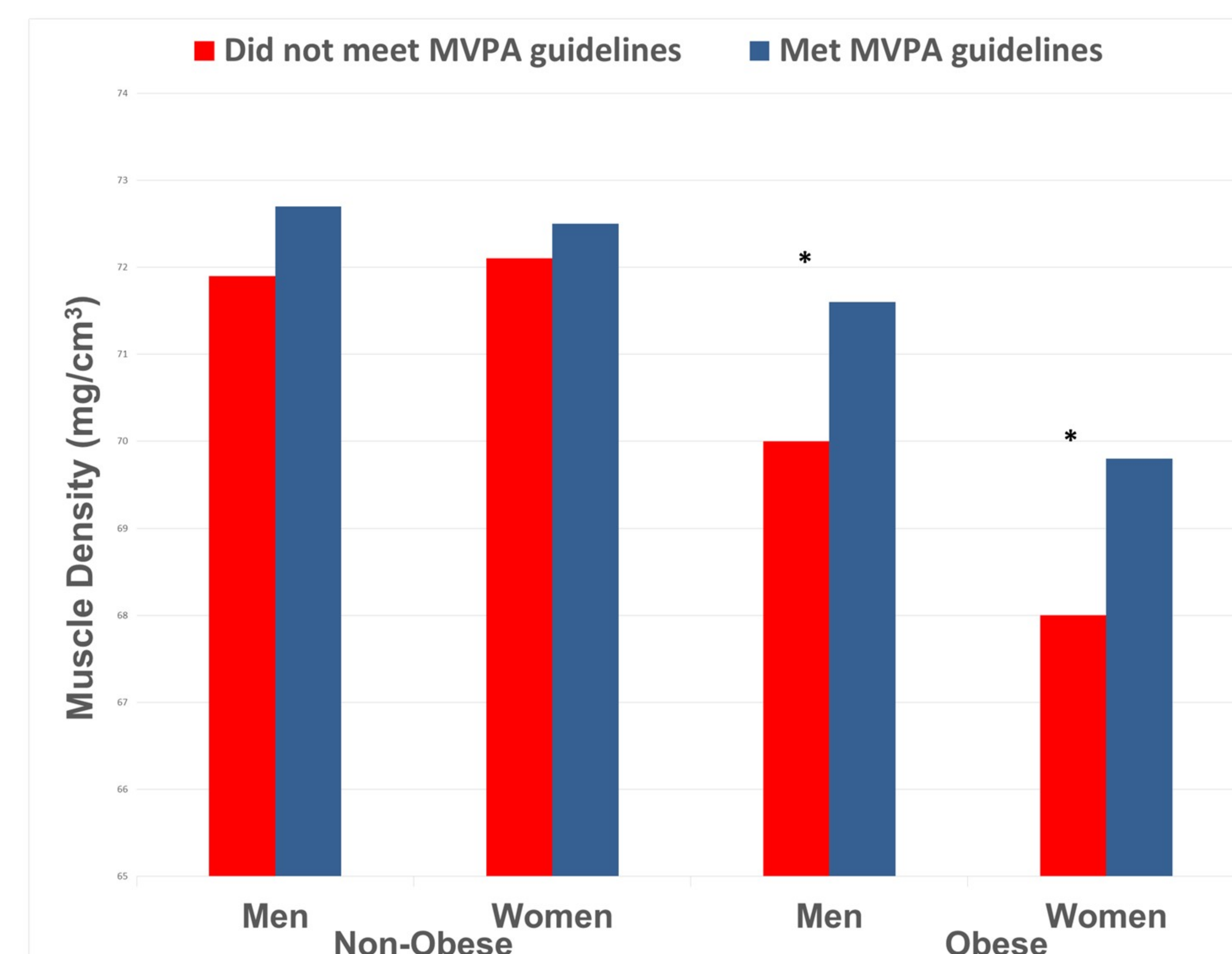
*Also adjusted for BMI

Table 2. Age Adjusted Spearman Correlation Coefficients

	Men			Women		
	SB %	LPA	MVPA	SB %	LPA	MVPA
Age (years)	0.49	-0.46	-0.32	0.27	-0.23	-0.18
BMI (kg/m ²)	0.59	-0.55	-0.33	0.65	-0.63	-0.41
Waist (cm)	0.57	-0.52	-0.34	0.50	-0.48	-0.36
Muscle Density* (mg/cm ³)	-0.07	0.01	0.18	-0.15	0.12	0.13

*Adjusted for age and BMI; Bold ≤ 0.05

Age Adjusted Mean Muscle Density Among African Caribbean Men and Women by Obesity Status



*P≤ 0.05

Conclusions

- Moderate to vigorous activity was associated with lower myosteatosi among both African Caribbean men and women.
- Sedentary behavior may be relevant for myosteatosi among African Caribbean women only.
- Associations between meeting MVPA guidelines and myosteatosi were only observed among obese, both in men and women.
- Promoting interventions to increase physical activity intensity may have an impact on lowering myosteatosi, an adipose tissue depot with an emerging role in cardio-metabolic health.

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