SIX WEEKS OF INTERMITTENT FASTING IMPROVES BODY COMPOSITION AND ABDOMINAL FAT THICKNESS

Brandon Smith, Zahcary Tocco, Matthew Mitchell, Ph.D

Dept. of Health and Human Performance, Palm Beach Atlantic University, West Palm Beach, FL, USA

Palm Beach Atlantic University

Human Performance Laboratory

ABSTRACT

The purpose of this study was to examine the effects of six weeks of intermittent fasting on measures of body composition. Twenty-two subjects participated in the study and were divided randomly into non fasting (CON) and fasting (TRF) groups. TRF subjects used an intermittent fasting protocol with a 6 hour eating window, while CON subjects maintained normal eating patterns. Body composition (via whole body plethysmography) and adipose tissue thickness (via B-Mode ultrasound measurement) was measured before (PRE) and after (POST) 6 weeks for both groups. A two-way repeated measures ANOVA was used to analyze differences between groups. Fat mass was significantly reduced in the TRN group (PRE: 25.87kg ±7.27, POST: 23.38 ±6.68) and abdominal fat thickness was lower (PRE: 1.99cm ±0.95, POST: 1.75cm ±0.82) v changes in the CON group. These findings suggest short term intermittent fasting alters body composition.

INTRODUCTION

Excess energy intake, weight gain and subsequent adiposity are consistently linked to illness, disability, and mortality. Research has been done that links different variations of intermittent fasting with a decrease in weight along with a decrease in blood pressure, cholesterol, and insulin resistance. Alternate-day fasting has also been shown to be effective at improving several risk factors associated with cardiovascular disease. Reduction of total cholesterol, triglycerides, and low-density lipoprotein (LDL) cholesterol have been observed.

Studies looking at losses in weight, body fat percentage, fat mass and fat free mass have found mixed results, often due to the differing fasting protocols utilized. However, few studies have also examined changes in fat-free mass. Likewise, the use of ultrasound imaging to visualize subcutaneous fat tissue has rarely been examined.

STATISTICAL ANALYSIS

Results were presented as mean ± standard deviation. A two-way repeated-measures ordinary ANOVA was performed in order to assess differences between groups over the course of the study. All differences were considered significant at $P < 0.05$. The analysis was performed through Microsoft Excel.

METHODS

A 6 week controlled trial was conducted with 22 subjects. All participants read and signed an informed consent document with the description of the testing procedures approved by the IRB approval board at Palm Beach Atlantic University.

Subjects were separated evenly into a control (CON) and fasting (TRF) groups. The normal diets maintained by the CON group required a minimum of three meals a day in order to meet their caloric requirements. TRF subjects fasted for 18 hours a day with a 6 hour feeding window for the entirety of the 6 weeks. Body composition assessments were made before (PRE) and after (POST) the 6 week trial.

Feeding Protocol

TRF subjects were given a list of items they can intake without breaking their fast to ensure subject adherence. This list consisted of the following: water, black coffee (no creamer or sugar), black tea (no creamer, sugar, or fruit flavorings), apple cider vinegar, and mineral supplements (sodium, potassium, and magnesium). TRF subjects were given dietary recommendations from the researcher regarding what they should eat during their 6-hour window. These recommendations were simply to better enhance weight loss but were not required for the subjects to follow exactly due to difficult program adherence. These recommendations were

- The 6 hour eating window would consist of two meals
- Meals should be high in fat and protein
- Subjects should limit their intake of carbohydrates
- Meals are recommended to be under or equal to 1500 calories in both male and female subjects.

Body Composition Assessment

Body Composition: The BodPod® (Cosmed, Inc) whole-body plethysmograph was used to measure body composition: fat mass, fat free mass and % body fat.. Anthro-pometric measurements (height and weight) were measured in all subjects.

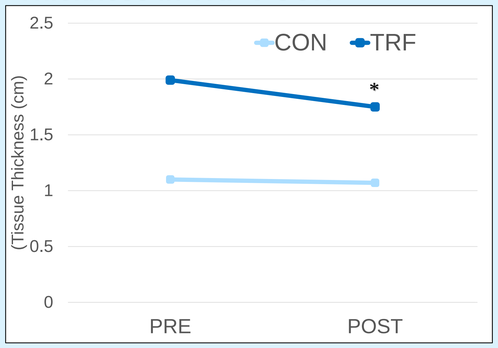
Fat Tissue Measurement: An Acuson Sequoia 256 ultrasound device was used to measure adipose tissue thickness in the lower abdomen (approximately a half inch lateral and an inch down from the navel on the left side with the transducer held horizontally) A 6L3 high frequency transducer was used in B mode with adequate gel application on the site. Measurement calipers were used to measure distance perpendicular to the skin to the nearest .01mm.

RESULTS

Table 1. Changes in TRF v CON subjects (PRE v POST)

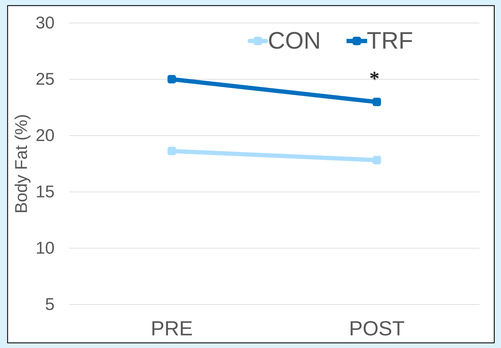
Variable	Group	PRE	POST
% Body Fat	CON	18.63 ±7.33	17.82 ±7.38
(%)	TRF	25.01 ±8.14	22.99 ±7.44
Fat Mass	CON	20.26 ±9.12	19.08 ±8.32
(kg)	TRF	25.87 ±7.27	23.38 ±6.68
Total Body Mass	CON	67.46 ±10.64	67.71 ±10.92
(kg)	TRF	70.10 ±14.54	69.36 ±14.77
Abdominal Thickness	CON	1.10 ±0.74	1.07 ±0.70
(cm)	TRF	1.99 ±0.95	1.75 ±0.82

Graph 1. Abdominal Tissue Thickness in TRF v CON



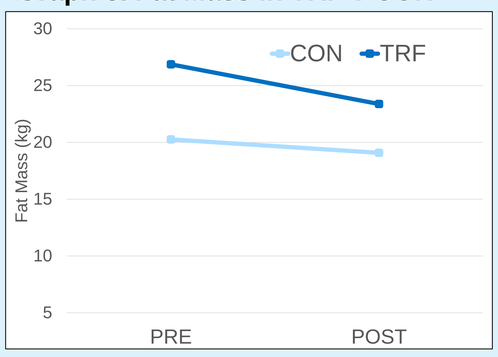
*Significant time x trt difference ($p<0.05$). PRE > POST in TRF

Graph 2. % Body Fat in TRF v CON

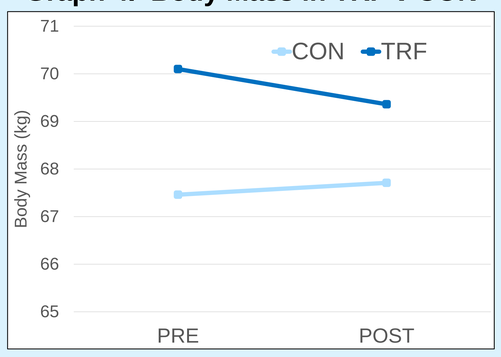


* Significant trt difference ($p<0.05$) PRE > POST in both groups

Graph 3. Fat Mass in TRF v CON



Graph 4. Body Mass in TRF v CON



FINDINGS

- Abdominal fat thickness was significantly decreased with six weeks of intermittent fasting when compared to a non-fasting control group.
- Improvements were found in both control and fasting groups, possibly due to study involvement providing motivation to the control group as well.
- Though chosen randomly, the fasting group began the study with higher %body fat, total body mass, fat mass and fat thickness. This may have provided a greater “potential” for improvements during the 6 week period.
- Three TRF subjects were removed from the study due to lack of protocol adherence.