Factors Associated with Visceral Fat Loss in Response to a Multifaceted Weight Loss Intervention

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Visceral adipose tissue is more metabolically active than other fat depots and is more closely associated with obesity-related diseases, such as cardiovascular disease and type 2 diabetes, than indicators of obesity, such as body mass index. Across various strategies to promote weight loss, including energy-reduced diet and exercise, variable effects on VAT compared to loss of total body fat have been reported.

To examine the effect of a behavioral weight loss intervention using portion-controlled prepackaged entrées on VAT, we examined data and measurements from overweight/obese men and women (N=183) who were assigned to a weight loss intervention and prescribed a reduced-energy diet with either portion-controlled prepackaged entrées or self-selected meals in a randomized clinical trial. VAT was estimated with dual-energy X-ray absorptiometry at baseline and study end (12 weeks).

VAT loss was greater for the prepackaged entrees group (p=0.02), with an average loss of 29% compared to an average loss of 19% among participants consuming self-selected meals. VAT (mean [SEM]) was 1651 (71) g and 1546 (157) g at baseline and 1234 (59) g and 1278 (118) g at study end in the prepackaged entrees and self-selected meal groups, respectively. Greater VAT loss was associated with higher baseline weight and VAT, and greater weight loss, but not associated with age or physical activity.

Prescribing portion-controlled prepackaged entrees in a behavioral weight loss intervention promotes a reduction in VAT, which should promote improved metabolic profile and reduced cardiovascular disease risk.

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selected diet, would promote weight loss in the context of a multifaceted intervention involving reduced-energy diet prescription and behavioral counseling [22]. We found that the meal plan incorporating portion-controlled prepackaged entrées promoted greater weight and fat loss than a standard self-selected diet, with comparable meal satisfaction [22]. The first specific aim of the present study was to examine whether VAT was differentially reduced across the meal plan group assignment in association with total weight and fat loss in the participants in that trial. A second specific aim was to examine the characteristics and factors associated with loss of VAT in this study population, because study participants were also encouraged to increase moderate and strenuous physical activity, which has been observed to independently reduce VAT [23].

Materials and Methods

Study population

As previously described [22], a multi-ethnic cohort of 77 men and 106 women with BMI 27-40 kg/m^2 were enrolled into the study. The flow of participants during screening and study participation has been reported previously [22]. Age ranged from 25 to 65, with a mean of 46 years (Table 1).

Characterstics	Prepackaged entrees (n = 138)	Self-selected meals (n = 45)
Age, yrs, mean	46.2 (0.9)	45.6 (1.6)
Sex %		
Female	55.8	64.4
Male	44.2	35.8
Weight, kg, mean	95.9 (1.3)	95.9 (2.3)
BMI, kg/m^2, mean	33.1 (0.3)	33.5 (0.6)
Moderate/strenuous activity hours/week, mean	2.6 (0.2)	2.2 (0.3)

Results

Along with signiẐcant decreases in body weight, there were concurrent signiẐcant reductions in both study groups in total and percent body fat; android fat, gynoid fat, VAT, and lean body mass (Table 2).

Variable	Prepackaged entrées (n = 138) Mean	Self-selected meals (n = 45) Mean
Total fat, kg		
Baseline	39.0 (0.7)	40.3 (1.3)
3 months	33.2 (0.8)	36.1 (1.2)
p value	<0.0001	<0.0001
% Fat		
Baseline	41.1 (0.6)	42.3 (1.0)
3 months	37.8 (0.7)	40.2 (1.0)
p value	<0.0001	<0.0001
Android fat, kg		
Baseline	3.9 (0.1)	3.9 (0.2)
3 months	3.1 (0.1)	3.4 (0.2)
p value	<0.0001	<0.0001
Gynoid fat, kg		
Baseline	6.0 (0.1)	6.5 (0.2)
3 months	5.1 (0.1)	5.7 (0.2)
p value	<0.0001	<0.0001
Visceral fat, g		
Baseline	1651 (71)	1546 (137)
3 months	1234 (59)	1278 (118)
p value	<0.0001	<0.0001
Lean mass, kg		
Baseline	53.5 (1.0)	52.3 (1.7)
3 months	51.7 (1.7)	51.2 (1.7)
p value	<0.0001	0.001
Weight, kg		
Baseline	95.9 (1.3)	95.9 (2.3)
3 months	87.8 (1.3)	90.1 (2.2)
p value	<0.0001	<0.0001

[a] Analysis used paired t-tests, comparing baseline and 3 months within group.

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