

Summer Meeting hosted by the Irish Section, 16–19 July 2012, Translational nutrition: integrating research, practice and policy

Associations between leptin, adiponectin and body composition in healthy adults

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Obesity, particularly central obesity, is a well-known risk factor for cardiovascular disease (CVD)⁽¹⁾ and may be partly attributed to the dysregulation of inflammatory molecules secreted from adipose tissue (adipokines)^(2,3). However, the majority of studies to date have focused on overweight and obese individuals, and have mainly used proxy measures of adiposity, such as body mass index (BMI) and waist circumference (WC). The aim of the current study was to determine the association between body composition and leptin and adiponectin in apparently healthy men and women.

Fasting blood samples were obtained from consenting volunteers, aged 19–55 years (*n* 53). Plasma concentrations of both pro- and anti-inflammatory adipokines: leptin and adiponectin respectively were determined by ELISA (R&D Systems, Oxford, UK). Anthropometric measures were taken to calculate BMI (kg/m²). Body composition was determined by dual-energy x-ray absorptiometry (iDXA, GE Healthcare, UK). Fat mass (FM, kg) was adjusted for height (fat mass index, FMI, kg/m²) and also expressed relative to fat-free mass (%). Trunk FM was also expressed relative to total trunk weight (%). Data for men and women were analysed separately.

	Leptin (ng/ml)						Adiponectin (ug/ml)					
	Males (<i>n</i> 17)			Females (<i>n</i> 36)			Males (<i>n</i> 17)			Females (<i>n</i> 36)		
	β	S.E	P*	β	S.E	P*	β	S.E	P*	β	S.E	P*
BMI (kg/m²)	5.32	1.49	0.003	4.80	1.41	0.002	-0.00	0.03	0.914	-0.08	0.04	0.052
FM (kg)	2.07	0.33	<0.001	2.45	0.38	<0.001	-0.04	0.01	0.931	-0.04	0.02	0.031
FMI (kg/m²)	2.21	0.31	<0.001	2.61	0.37	<0.001	0.01	0.04	0.842	-0.10	0.05	0.027
FM:FFM (%)	2.29	0.29	<0.001	2.402	0.33	<0.001	0.00	0.01	0.791	-0.01	0.01	0.043
WC (cm)	0.06	0.02	0.001	0.06	0.03	0.017	0.00	0.01	0.929	-0.04	0.02	0.100
Trunk FM (%)	0.09	0.01	<0.001	0.08	0.01	<0.001	0.00	0.01	0.779	-0.03	0.01	0.012

*Significant association with adipokine concentration (*P*<0.05, multiple regression), including age as a covariate in each model.

Leptin and adiponectin concentrations were significantly higher in females than males [mean ± SD values for females vs. males in leptin and adiponectin respectively; 10.71 ± 12.7 vs. 4.18 ± 2.81 ng/ml and 13.1 ± 6.36 vs. 3.65 ± 1.61 ug/ml; both *P*<0.01]. All indices of body composition were significantly associated with circulating leptin concentrations in males and females, with BMI demonstrating the strongest association (β 5.32 and 4.80, respectively). Only FM (kg), FMI (kg/m²), FM:FFM (%) and % trunk FM significantly predicted circulating adiponectin concentrations in females, with FMI demonstrating the strongest association (β -0.10). In contrast, no associations were apparent between body composition and circulating adiponectin concentrations in males.

These results highlight the importance of accurately measuring body composition and appropriately adjusting for body size when examining the associations between inflammatory markers and body composition.

This work was funded by the Department for Employment and Learning. Ethical approval was obtained from the University of Ulster Research Ethics Committee and the study was conducted according to the guidelines laid down in the Declaration of Helsinki.

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