

The challenge of translating nutrition research into public health nutrition, University College, Dublin, 18–20 June 2008

C-reactive protein and body composition in a representative sample of young adults

L. K. Forsythe, M. B. E. Livingstone, M. S. Barnes, G. Horigan and J. M. W. Wallace
Northern Ireland Centre for Food and Health, University of Ulster, Coleraine BT52 1SA, UK

Adipose tissue secretes a number of proteins and other inflammatory molecules, termed adipokines⁽¹⁾. Circulating levels of these adipokines become dysregulated with increased adiposity, providing a mechanism linking obesity to its co-morbidities⁽²⁾. However, to date most studies have focused on obese or morbidly-obese populations. The aim of the present study was to investigate the relationship between body composition and C-reactive protein (CRP) as a marker of inflammation and an independent risk factor for vascular disease⁽³⁾ in a representative sample of young adults. Apparently-healthy men and women aged 20–40 years (*n* 119; fifty-eight males and sixty-one females), recruited from the local population, provided a single fasting blood sample that was used to measure CRP concentration. Anthropometric measurements included height, weight and waist circumference. Fat and fat-free mass were measured by air-displacement plethysmography (BODPOD[®]; Life Measurement Inc., Concord, CA, USA) and adjusted for height to give fat mass index and fat-free mass index respectively. Data for men and women were analysed separately. Differences in CRP between the age-groups approached significance for females (*P*=0.05) and were significant for males (*P*=0.04), therefore age-group-specific analysis was also performed.

	Females aged ≤30 years (<i>n</i> 31)			Females aged >30 years (<i>n</i> 30)		
	OR	95% CI	<i>P</i> *	OR	95% CI	<i>P</i> *
Weight (kg)	1.05	0.99, 1.12	0.09	1.00	0.95, 1.06	0.97
BMI (kg/m ²)	1.18	0.97, 1.42	0.09	1.05	0.90, 1.23	0.52
Waist circumference (cm)	1.05	0.97, 1.14	0.22	1.03	0.96, 1.10	0.40
Fat mass (kg)	1.10	1.01, 1.21	0.04	1.01	0.95, 1.09	0.70
Fat mass (%)	1.11	0.99, 1.23	0.06	1.03	0.94, 1.12	0.56
Fat mass index (kg/m ²)	1.32	1.02, 1.70	0.03	1.06	0.88, 1.29	0.53
Fat-free mass (kg)	1.10	0.94, 1.28	0.24	0.95	0.82, 1.09	0.44
Fat-free mass index (kg/m ²)	1.07	0.62, 1.84	0.82	1.10	0.67, 1.80	0.71
Fat: fat-free mass (%)	1.05	1.00, 1.09	0.04	1.01	0.98, 1.05	0.51

*Significant predictors of CRP (*P*<0.05) were determined by logistic regression analysis with age included as a covariate.

For women body composition was not significantly different between those aged ≤30 years and those aged >30 years. Logistic regression analyses, including age, showed that fat mass, fat mass index and fat:fat-free mass (%) were significant predictors of CRP in younger women (aged ≤30 years). The OR showed that for each unit increase in fat mass, fat mass index and fat:fat-free mass (%) the risk of having a higher CRP (defined as above the median; >1.2 mg/l) increased by 10%, 32% and 5% respectively. Body composition did not predict CRP for women aged >30 years or for men (data not shown).

In conclusion, for healthy young women (aged ≤30 years) fat mass, particularly fat mass adjusted for height, predicts circulating concentrations of the inflammatory marker CRP. These results also highlight the importance of accurately measuring body composition and appropriately adjusting for body size when examining the associations between inflammatory markers and body composition.

We would like to acknowledge the Department of Education & Learning and the Food Standards Agency for their support.

1. Trayhurn P & Wood IS (2004) *Br J Nutr* **92**, 347–355.
2. Fantuzzi G (2005) *J Allergy Clin Immunol* **115**, 911–919.
3. Ridker PM, Buring JE, Cook NR & Raifai N (2003) *Circulation* **107**, 391–397.