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The relationship between body composition and vitamin E status in females aged 18–40 years

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Obesity is an independent risk factor and a major contributor to morbidity and mortality in the general population[1]. The condition is associated with alterations in both lipid metabolism and adipose tissue distribution[2], which may affect plasma concentrations of the fat soluble vitamin E. Vitamin E, found in the diet in the form of four tocopherols (α-, β-, γ- and δ-) four tocotrienols (α-, β-, γ- and δ-), is an important antioxidant. Previous studies investigating the relationship between α-tocopherol, and % body fat have shown conflicting results, one study finding a positive correlation[3] and the other no significant correlation[4]. The aim of this study was to determine whether plasma α- and γ-tocopherol concentrations were associated with measures of adiposity in apparently healthy females between 18 and 40 years of age.

A total of 32 normal weight (BMI 18.5–24.9 kg/m^2) and 22 overweight/obese (BMI 25–39 kg/m^2) volunteers participated in the study. Plasma α- and γ-tocopherol were measured by HPLC (Waters Ltd, Dublin, Ireland). Serum lipids were measured using standard commercial kits. Body composition was analysed using BodPod® by air displacement plethysmography.

	Normal (n = 32)		**Overweight/obese (n = 22)**	
	Mean	SD	Mean	SD
α-tocopherol (μmol/l)	23.98	3.51	23.91	5.02
α-tocopherol/cholesterol (μmol/mmol)	5.24	0.49	5.17	0.63
γ-tocopherol (μmol/l)[?Ψ]	1.57	1.36–1.86	1.53	1.19–2.30
γ-tocopherol/cholesterol (μmol/mmol)[Ψ]	0.37	0.27–0.49	0.37	0.27–0.43
Percent fat (%)	26.3	6.62	35.9	4.27**
Fat mass (kg)[??Ψ]	14.9	12.7–19.7	26	23.4–27.8**
Fat free mass (kg)	44.1	4.72	48.1	5.05*
Fat mass index (kg/m^2)[Ψ]	5.76	4.69–7.12	9.53	8.89–10.42

[Ψ]Results expressed as medians and IQR.
Mean values were significantly different from those of normal weight.
*P = 0.001; **P = 0.001 from independent samples T-tests.

There were no significant differences in plasma α- and γ-tocopherol and lipid concentrations between the normal weight and the overweight obese groups. No significant correlations were found between plasma tocopherol status and measures of adiposity. In conclusion, vitamin E status does not appear to be affected by increased adiposity in females with a BMI of 25–39 kg/m^2 compared to normal weight females. Due to a limited sample size, further research is warranted to investigate if obesity affects vitamin E status.

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