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Serum 25-Hydroxyvitamin D concentrations in relation to dietary fat intake and body fat concentration in Caucasian and Asian women

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Growing obesity rates cultivated by transitions in lifestyle factors has manufactured a plethora of related non-communicable illnesses including cardio-metabolic disease. Although classically associated with skeletal health, the discovery of vitamin D receptors in numerous non-skeletal tissues and cells (including adipose)[1] combined with the association between serum 25-Hydroxyvitamin D (25(OH)D) and diseases commonly allied with obesity[2], supports 25(OH)D association with dietary fat and adiposity.

This study aimed to examine the relationship between intake of various dietary fats and body fat composition with serum 25(OH)D in 110 pre- and postmenopausal Caucasian and Asian women. All anthropometric measures, dietary data and serum 25(OH)D levels were provided by the D-FINES study (Vitamin **D**, **F**ood **I**ntake, **N**utrition and **E**xposure to **S**unlight in Southern England) conducted at the University of Surrey. All subject anthropometric, fat intake and serum 25(OH)D measurements were statistically analysed, and mean fat intakes were compared against UK recommendations. Spearman's correlation coefficient was used to examine the relationship between serum 25(OH)D, anthropometry, and dietary fat intake in all ethnic and menopausal sub-groups.

The results illustrate no significant difference between any anthropometric variable other than BMI in postmenopausal women of both ethnicities ($P = 0.005$), possibly a result of low subject number. Furthermore, no significant difference was observed in consumption of any dietary fat between sub-groups, likely due to limited subject response to the dietary assessment. However, serum 25(OH)D levels were significantly lower in *both* pre- and postmenopausal Asian women when compared to Caucasian women ($P = 0.000$). The table below displays a significant negative association linking serum 25(OH)D with weight and BMI in postmenopausal Caucasian women only. Statistical analysis found no significant association between 25(OH)D and fat intakes in any of the sub-groups.

		Serum 25(OH)D			
Ethnicity	**Reproductive status**	**Standing Height (m)**	**Weight (kg)**	**BMI (kg/m^2)**	**Waist to Hip Ratio**
Caucasian	Total (n = 74)	0.05	−0.29* (P = 0.011)	−0.29* (P = 0.011)	−0.05
	Premenopausal (n = 18)	0.22	0.070	−0.069	0.22
	Postmenopausal (n = 56)	0.004	−0.38** (P = 0.004)	−0.35** (P = 0.008)	−0.16
Asian	Total (n = 34)	−0.35	0.031	0.139	−0.18
	Premenopausal (n = 15)	−0.10	−0.11	−0.06	−0.19
	Postmenopausal (n = 19)	0.009	0.17	0.12	−0.33

*Correlation is significant at the 0.05 level. ** Correlation is significant at the 0.01 level.

Consequently, this study demonstrated serum 25(OH)D to be associated with weight and BMI, but not fat consumption. It is suggested that deficiency is targeted in Asian women, and further research with a larger sample size is recommended.

1. DeLuca HF (2004) *Overview of general physiologic features and functions of vitamin D*. American Journal of Clinical Nutrition **80**, 1689S–1696.
2. Pearce SHS and Cheetham TD (2010) *Diagnosis and management of vitamin D deficiency.* British Medical Journal; **340**, b5664.

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