

## Vitamin D deficiency, poor bone health and the risk of CVD in Caucasian and South Asian women: analysis from the D-FINES study

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Bone health has been linked to CVD risk, suggesting that there may be an association between a poor serum lipid profile and increased bone resorption/lower bone mass. There are also data linking vitamin D ‘insufficiency’ with increased CVD. The D-FINES study (vitamin D, Food Intake, Nutrition and Exposure to Sunlight in Southern England) investigated the interaction between diet and sunlight exposure on vitamin D status. Fasted blood sample were collected at three monthly intervals from Summer 2006 to Spring 2007 on a total of 223 Caucasian (C) and seventy Asian (A) women aged 19–70 years. Bone quality including broadband ultrasound attenuation (BUA), velocity of sound (VOS), lumbar spine (LS) BMD and femoral neck (FN) BMD in Autumn 2006 and Spring of 2007 were assessed. The aim of the present subsidiary study was to examine the association between bone health (bone quality, bone resorption and PTH), vitamin D status and CVD. The table below shows correlations (*r*) between markers of CVD and BUA, VOS, FN and LS in Autumn season.

	TAG (mmol/l)	Cholesterol (mmol/l)	LDL (mmol/l)	HDL (mmol/l)	Insulin (mU/l)
<b>Autumn</b>					
BUA mH <sub>2</sub>					
C (n 68)	-0.11	-0.24* (-0.24*)	-0.22	-0.17	0.19
A (n 32)	0.15	0.02	0.02	-0.05	-0.02
VOS					
C (n 68)	-0.19	-0.27* (-0.28*)	-0.23	-0.19	-0.06
A (n 32)	0.29	0.17	0.08	0.17	0.01
LS g/cm <sup>2</sup>					
C (n 194)	-0.04	-0.21† (-0.19†)	-0.21† (-0.21†)	-0.09	0.08
A (n 50)	0.17	-0.07	-0.01	-0.19	-0.14
FN g/cm <sup>2</sup>					
C (n 193)	-0.05	-0.21† (-0.19†)	-0.18* (-0.19†)	-0.15* (-0.07)	0.15* (-0.02)
A (n 50)	0.29* (0.18)	0.01	0.11	-0.28* (-0.22)	0.01

\*Correlation is significant at the 0.05 level. †Correlation is significant at the 0.01 level, () partial correlation for BMI, C, Caucasian; A, Asian.

Negative correlations were apparent in most of the bone measures with lipid profiles in the C women but not A women. LS and FN bone densities were associated negatively with cholesterol and LDL in both seasons. A significant negative correlation between BUA, VOS and cholesterol was found in autumn only. A significant negative association was found between CTx and insulin level for both seasons. Higher CTx was associated with higher cholesterol and LDL. A significant correlation was found between PTH, TAG, cholesterol, LDL consistently in both seasons. These correlations remained significant after adjustment for BMI and vitamin D status. Significant negative correlations were found between markers of CVD and 25OHD status in all groups combined and then specifically in the C women but not A women (*P*<0.001). These data indicate a link between poor bone health and increased CVD risk in Caucasian population. The present findings are a cause for concern and warrant further investigation.

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