

Evidence of a link between osteoporosis risk and CVD in Caucasian but not Asian women : Results of the D-FINES study, BY O.A. HAKIM¹, F. SHOJAEE-MORADIE², K. HART¹, L.M. MORGAN¹, J.L. BERRY³, A.M. UMPLEBY², B.A. GRIFFIN¹ AND S.A. LANHAM-NEW¹ ¹Faculty of Health and Medical Sciences, University of Surrey, Guildford GU2 7XH. ²Postgraduate Medical School, University of Surrey, Guildford GU2 7XH. ³Vitamin D Research Group, University of Manchester. M13 9WL.

Osteoporosis has been linked to CVD, suggesting that it might be due to the association between serum lipids and bone health indices. We are currently examining lipid/ bone relationship as part to our D-FINES study (Vitamin **D**, **F**ood **I**ntake, **N**utrition and **E**xposure to **S**unlight in Southern England). We have shown a link between poor lipid profile and an increase in bone resorption and PTH¹. We explore further in this abstract the lipid/ bone density results. The aim of the present subsidiary study was to examine the association between serum lipids and 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 2007. The table below shows correlations (r) between markers of CVD and BUA, VOS, FN, and LS

		TAG (mmol/l)	Cholesterol (mmol/l)	LDL (mmol/l)	HDL (mmol/l)	Insulin (mU/l)
Autumn	BUA mH₂ C (n=68) A (n=32)	-0.11 0.15	-0.24* (-0.24*) 0.02	-0.22 0.02	-0.17 -0.05	0.19 -0.02
	VOS C (n=68) A (n=32)	-0.19 0.29	-0.27* (-0.28*) 0.17	-0.23 0.08	-0.19 0.17	-0.06 0.01
	LS g/cm² C (n=194) A (n=50)	-0.04 0.17	-0.21** (-0.19***) -0.07	-0.21** (-0.21***) -0.01	-0.09 -0.19	0.08 -0.14
	FN g/cm² C (n=193) A (n=50)	-0.05 0.29* (0.18)	-0.21** (-0.19***) 0.01	-0.18* (-0.19***) 0.11	-0.15* (-0.07) -0.28* (-0.22)	0.15* (-0.02) 0.01
Spring	BUA mH₂ C (n=41) A (n=15)	-0.23 0.19	-0.19 -0.03	-0.15 0.002	-0.13 -0.11	0.38* (0.35*) 0.002
	VOS C (n=41) A (n=15)	-0.30 0.262	-0.11 0.03	-0.08 0.15	-0.06 -0.27	0.29 0.21
	LS g/cm² C (n=191) A (n=50)	-0.04 0.16	-0.22** (-0.21***) -0.08	-0.22** (-0.22***) -0.02	-0.08 -0.19	0.08 -0.15
	FN g/cm² C (n=189) A (n=50)	-0.05 0.32* (0.29*)	-0.22** (-0.20***) -0.05	-0.19** (-0.20***) 0.04	-0.13 -0.28* (-0.27*)	0.10 0.002

*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 almost all the bone measures with lipid profiles in the Caucasian women but not the Asian women. LS and FN bone density was associated negatively with cholesterol and LDL in both seasons. A significant negative correlation between BUA, VOS and cholesterol was found in Autumn only. Interestingly, insulin was associated positively with FN BMD and BUA in Caucasian women. These correlations remained significant after adjustment for BMI and vitamin D status.

These data indicate a link between poor bone health and increased CVD risk in Caucasian populations. A possible potential mechanism of these CVD/ osteoporosis findings is that adipocytes and osteoblasts share a common progenitor from the stromal cell in the bone marrow. These finding certainly warrant further investigation

¹ Hakim et al submitted to NOS conference 2010 Liverpool.