INCREASED DIETARY PROTEIN IS STRONGLY ASSOCIATED WITH REDUCED BMD AND BMC AT THE FEMORAL NECK AND LUMBAR SPINE IN UK DWELLING SOUTH ASIAN WOMEN

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Abstract: There is a long standing controversy as to whether dietary protein is beneficial or detrimental to bone health. Protein has known hormonal anabolic effects on bone and may increase calcium absorption. However, high dietary protein intake may also increase physiological acid load and thus increase bone resorption. Also there is a considerable lack of research into the association between dietary protein and bone health in different ethnic groups, such as South Asians. In Autumn 2006, n=38 postmenopausal South Asian women took part in the D-FINES study (Vitamin D, Food Intake, Nutrition and Exposure to Sunlight in Southern England) and had a DXA scan (Hologic) and completed 4 day diet diaries. Relevant anthropometric and lifestyle information and serum 25(OH)D was also obtained. Partial correlations were run using PASW 18.0 to examine associations between protein intake (adjusted per Kg body weight) and DXA bone indices. For the fully adjusted model (model 2) there was a significant ($p<0.05$) negative correlation between protein intake and FNBMD, LSBMD and FNBMC, but no significant association for FN or LS bone area (data not shown). There was also a borderline significant negative association with LSBMC. In comparison, model 1 shows the data that was not fully adjusted for micronutrients, which was only statistically significant for FNBMC. Pearson correlations showed a significant positive relationship between dietary protein (per kg body weight) and NEAP (estimated by method of Frassetto¹ as Protein/Potassium) ($r=0.662$, $p<0.001$, $n=32$), as well as between dietary protein (per kg body weight) and dietary potassium ($r=0.429$, $p=0.014$, $n=32$). This negative result is very surprising considering most epidemiological studies and a recent meta-analysis² have shown a positive association between dietary protein and indices of bone health. Also, contrary to expectations, controlling for dietary vitamin C, Na, K, P and Mg (model 2) actually strengthened the association, not weakened it. Overall the strong negative association between dietary protein and bone indices found here in these older Asian women was unexpected and has not been examined before in the literature to the authors' knowledge. Further analysis of this dataset is ongoing to investigate these results further, particularly given that the Asian women were severely vitamin D deficient.

¹Frassetto LA, et al (1998). Am J Clin Nutr. 68(3):576-83.

²Darling AL et al (2009) Am J Clin Nutr. 90(6):1674-92

Image / Graph:

Partial correlations between protein intake (per Kg body weight) and DXA bone indices (n=17)

	Model 1*				Model 2**			
	FNBMD	FNBMC	LSBMD	LSBMC	FNBMD	FNBMC	LSBMD	LSBMC
r	-0.481	-0.642	-0.358	-0.356	-0.810	-0.999	-0.727	-0.619
p	0.07	0.01	0.19	0.19	0.005	<0.001	0.02	0.06
Mean	0.77g/cm ²	3.64g	0.92g/cm ²	47.72g				
SD	0.09	0.53	0.14	9.38				
Mean and SD for NEAP was 0.27 (0.01) mEq/d and for dietary protein was 1.62 (0.14)g per kg body weight. Median and interquartile range for dietary potassium intake was 2601(1030) mg.								
*Model 1- controlling for log age, log deprivation index, log physical activity, height, dietary Ca, log 25(OH)D status and energy intake; **Model 2-controlling for log age, log deprivation index, log physical activity, height, dietary Ca, log 25(OH)D status, energy intake, log dietary vitamin C, log dietary Na, log dietary K, dietary P and Mg.								

Disclosure of Interest: None Declared