



Vitamin D status, functional ability and muscle strength in older South Asian and Caucasian women in the UK

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A large number of studies show a positive relationship between vitamin D status and physical performance in older persons on a variety of muscle strength tests^{1–2}. Despite this, little research has assessed whether there are ethnic differences in the relationship between 25(OH)D and muscle function. Therefore, the aim of this work was to assess the relationship between muscle function and vitamin D status in older South Asian and Caucasian women. In 2010, $n=75$ ($n=19$ Asian, $n=56$ Caucasian) postmenopausal women (aged 58–71 years) attended the University of Surrey for measurements of vitamin D status [25-hydroxyvitamin D; 25(OH)D] and muscle strength (stand to walk test (3 m), grip strength, and a difficulty with tasks of daily living questionnaire).

Correlations between right hand grip strength and 25(OH)D were relatively weak ($r=0.04–0.23$; Table 1) with no statistically significant correlations between 25(OH)D and grip strength in either ethnic group. For stand to walk time, the only statistically significant association was a negative association between 25(OH)D and stand to walk time in Caucasians (BMI adjusted $r=-0.269$, $p=0.045$) but this relationship was not significant when BMI was adjusted for. There was no association between stand to walk time and 25(OH)D in Asians (BMI adjusted $r=-0.167$, $p=0.537$). Finally, for the total score on the difficulty with daily living questionnaire, there was a significant association between self-reported difficulty with daily living tasks and 25(OH)D in Asians only (Caucasians: BMI adjusted $r=0.155$ $p=0.254$; Asians BMI adjusted $r=0.474$ $p=0.040$).

Table 1. Correlations for 25(OH)D and muscle strength tests in postmenopausal women

25(OH)D×GS	Unadj. ^a	Age ^b	Height ^c	25(OH)D×STW	Unadj. ^a	Age ^b	BMI ^d
Caucasians	r 0.226	0.217	0.208	Caucasians	r -0.269	-0.271	-0.233
	p 0.097	0.115	0.132		p 0.045	0.046	0.087
	n 55	55	55		n 56	56	56
Asians	r 0.042	0.092	0.070	Asians	r -0.162	-0.338	-0.167
	p 0.866	0.717	0.784		p 0.535	0.200	0.537
	n 19	19	19		n 17	17	17

GS=grip strength (right hand); STW=stand to walk time (3 m); a=unadjusted (Pearson's correlation), b=age adjusted (partial correlation), c=height adjusted (partial correlation), d=BMI adjusted (partial correlation).

Overall, there was no association between vitamin D status and grip strength or stand to walk time in either ethnic group. In Asians only, difficulty with tasks of daily living was positively associated with vitamin D status, independent of BMI. This suggests that improving the vitamin D status of older South Asian women in the UK may improve their functional ability. However, it must be borne in mind that this is self-reported functional ability, which may differ from actual functional ability. Also, the sample size was small in this study, especially for the Asian group, suggesting some of the analyses may be underpowered. Last, the mean (SD) for 25(OH)D in Asians was 57.4 nmol/L (21.5), meaning the Asian women were on average classified as 'vitamin D sufficient' (25(OH)D \geq 50 nmol/L). Hence, the results found here may differ if undertaken in a severely vitamin D deficient group of South Asian women.

ALD is the recipient of a Cross-Faculty University of Surrey PhD Scholarship.

- Houston DK, Toozé JA, Davis CC, Chaves PH *et al.* (2011) *J Am Geriatr Soc* (59) 1793–801.
- Toffanello ED, Perissinotto E, Sergi G, Zambon *et al.* (2012) *PLoS One* (7) 349–350.