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Vitamin D, muscle strength and physical function in UK South Asian older women

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Abstract

A positive association has been reported between vitamin D status, muscle strength and physical function in older Caucasian women. However, little is known about this relationship in UK South Asian older women. This cross-sectional study aimed to explore the association between vitamin D status, muscle strength and physical function in UK South Asian (Pakistani and Indian) older women.

One hundred and twenty community-dwelling women were recruited via visiting community centres, mosques, Indian temples (Gurdwara) and by word of mouth (between January to May 2018). Inclusion criteria were: community-dwelling, South Asian women, age 60 years and above, able to communicate effectively and able to give written or verbal consent. A general interview (demographic, anthropometric, self-reported exhaustion, health history, supplementation use/duration/dose), handgrip strength (kg), short physical performance battery (single chair stand, repeated chair stands, balance, timed up-and-go test), and blood 25 hydroxyvitamin D (25(OH)D, nmol/l) concentration were performed. Dietary intake and self-reported physical activity was also assessed using multiple-pass 24-hour diet recall method and International Physical Activity Questionnaire (IPAQ) short form respectively.

Overall, 47% of participants had insufficient blood 25(OH)D concentration ($< 50\text{nmol/L}$) and 53% had sufficient blood 25(OH)D ($\geq 50\text{nmol/L}$) using the IOM classification. As expected 86% of current vitamin D supplement users had adequate vitamin D status and only 14% of women who reported current vitamin D supplement use had insufficient vitamin D status. Amongst supplement non-users 68% had insufficient vitamin D status and only 32% had adequate levels. An inverse correlation (Spearman's analysis) was found between vitamin D status and single chair stand test (sec) ($r = -0.25$, $p = 0.006$); repeated chair stand test (sec) ($r = -0.29$, $p = 0.002$) and timed up-and-go test (sec) ($r = -0.20$, $p = 0.02$). No correlation was observed between vitamin D status and handgrip strength ($r = 0.09$, $p = 0.30$).

The prevalence of vitamin D insufficiency is high in post-menopausal South Asian women not taking vitamin D supplements. Significant association was observed between vitamin D status and some aspects of muscle strength and physical function. We are now conducting a randomized control trial to investigate whether vitamin D supplementation may restore muscle strength and function in this population.

Conflict of Interest

There is no conflict of interest