

Low D, Low Strength?

Vitamin D deficiency is associated with age-related loss of strength

The loss of muscle mass as we age is inevitable to an extent. However, we certainly want to fight to maintain our muscle mass. This is why resistance training becomes so important as we age. But what if there is another tool that can help us to maintain our muscle mass, strength, and function? A deficiency of this important vitamin can increase our risk of muscle loss by up to 78%. Read on to see which vitamin is this important.



Abstract

- Epidemiological evidence showing the association between low 25(OH)D and age-related reduction in neuromuscular strength (dynapenia) is a paucity and controversial and, to date, the effect of osteoporosis and vitamin D supplementation on these associations has not been measured. Thus, we analyze whether serum 25(OH)D deficiency and insufficiency are risk factors for the incidence of dynapenia in individuals aged 50 or older and whether osteoporosis or vitamin D supplementation modify these associations. For that, 3205 participants of the ELSA study who were non-dynapenic at baseline were followed for 4 years. Vitamin D was measured at baseline by the serum concentration of 25(OH)D and classified as sufficient (> 50 nmol/L), insufficient (≥ 30 and ≤ 50 nmol/L) or deficient (< 30 nmol/L). The incidence of dynapenia was determined by a grip strength < 26 kg for men and < 16 kg for women at the end of the 4-year follow-up. Poisson regression models were adjusted by sociodemographic, behavioral, clinical and biochemical characteristics. Serum 25(OH)D deficient was a risk factor for the incidence of dynapenia (IRR = 1.70; 95% CI 1.04–2.79). When only individuals without osteoporosis and those who did not use vitamin D supplementation were analyzed, both serum 25(OH)D deficiency (IRR = 1.78; 95% CI 1.01–3.13) and insufficiency (IRR = 1.77; 95% CI 1.06–2.94) were risk factors for the incidence of dynapenia. In conclusion, a serum level of 25(OH)D < 30 nmol/L is a risk factor for the incidence of dynapenia. Among individuals without osteoporosis and those who do not take vitamin D supplementation, the threshold of risk is higher (≤ 50 nmol/L).

I think we are all well aware of the importance of vitamin D for bone health as we age, but for muscle health? Vitamin D deficiency becomes more prevalent with age. This study analyzed if low vitamin D levels are associated with the age-related loss of muscle strength (dynapenia). They checked serum vitamin D levels in a group of 3205 people over age 50 who had normal strength at the start of the study and followed them for 4 years. They found that the group with vitamin D deficiency (< 30 nmol/L) had a 70% increased risk of dynapenia. For people with osteoporosis, the threshold of risk is higher, and this group should shoot for higher serum vitamin D levels over 50 nmol/L.

What is the mechanism of this finding? The authors postulate that vitamin D exerts an influence on the expression of contractile proteins and the differentiation of muscle fibers, which affects the quantity of muscle mass. Additionally, it participates in the regulation and transport of calcium, which exerts an influence on muscle contraction kinetics. Therefore, through two distinct but interlinked mechanisms, vitamin D plays a role in the generation of neuromuscular strength.

This is an interesting study and suggests that part of our health aging strength training routine should probably include taking a vitamin D supplement. Additionally, previous research showed a 31% increase in vitamin D levels for people who met recommended exercise levels. Exercise and vitamin D supplementation appears to be a win for maintaining strength as we age!

Delinocente, M.L.B., Luiz, M.M., de Oliveira, D.C. et al. Are Serum 25-Hydroxyvitamin D Deficiency and Insufficiency Risk Factors for the Incidence of Dynapenia?. Calcif Tissue Int 111, 571–579 (2022). <https://doi.org/10.1007/s00223-022-01021-8>.