

RESEARCH ARTICLE

Narrative Review of Vitamin D and its Health Enhancing Potential in Older Sarcopenic Adults with or at Risk for Osteoarthritis

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Received: May 30, 2025

Published: June 10, 2025

Citation: Marks R. Narrative Review of Vitamin D and its Health Enhancing Potential in Older Sarcopenic Adults with or at Risk for Osteoarthritis. *Int J Complement Intern Med.* 2025;6(3): 364–373. DOI: 10.58349/IJCIM.3.6.2025.00151

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Abstract

Background: Sarcopenia, a well-established aging correlate impacting muscle and bone mass deficits induces widespread and seemingly intractable and progressive negative impacts on health and longevity in all parts of the world, especially, among older adults with chronic health conditions.

Aim: The first aim of this article was to examine, summarize, synthesize, and report on the health condition osteoarthritis and its impact and sarcopenic attributes. A second was to uncover if vitamin-D may avert this age associated muscle strength and mass declines in older cases with osteoarthritis. A third was to provide directives for researchers or professionals who work or are likely to work in this realm in the future.

Methods: All English language relevant publications detailing the possible efficacy of vitamin D as an intervention strategy for minimizing sarcopenia in osteoarthritis cases as published between 2020-2025. Relevant articles were carefully examined and those meeting the review criteria were carefully read, and described in narrative form.

Results: Collectively, these data reveal vitamin D is a powerful steroid like compound that is required by the body to help many life affirming physiological functions, including optimal muscle and bone mass processes, but its deficiency may seriously impact the health status and well being of the older adult and others, especially those suffering from sarcopenia.

Conclusion: Since vitamin D is not manufactured by the body directly, ensuring those older adults at high risk for multiple disabling osteoarthritis disease outcomes have access to safe vitamin D exposures may expect clients will benefit physically as well as mentally.

Keywords: Aging, Osteoarthritis; Muscle Mass, Sarcopenia, Prevention, Vitamin D

Introduction

The disabling joint condition termed osteoarthritis remains an intractable problem affecting many older adults in all parts of the world and despite years of study and investigation of the many possible causes thereof. Related research is however alluding to a role for muscle as a disease modifier or mediator, and for a specific condition termed sarcopenia, and denoting muscle wasting, in influencing this condition negatively. This is because sarcopenia wherein declines in bone and muscle mass are consistent features may expose the joint cartilage lining to undue injurious impacts and forces. In addition, the impact of sarcopenia on declining physical as well as functional wellbeing in the older population may exacerbate osteoarthritis disability significantly in its own right.

At the same time, a growing body of research points to muscle as a target for intervention in osteoarthritis including efforts to avert preventable modes of muscle mass declines that may be reactive as well as causative. To this end, this overview focuses on a possible role for vitamin D, a fat-soluble vitamin with anti-oxidant properties as a possible antidote to both the widespread risk of severe sarcopenia, as well as for mediating osteoarthritis severity.

This line of intervention may be indicated among those older adults who now have restrictions placed on their movements due to their pain and limited physical ability as well as being highly vulnerable to the consequences of vitamin D deficiency, falls, frailty and a low life quality¹⁻⁶ and muscle atrophy.⁷

There is however quite a vast gap in terms of agreeing that vitamin D can prevent sarcopenia through its impact on mitochondrial dysfunction in skeletal muscle cells⁷ or whether vitamin D will benefit an older sarcopenic adult if their muscle tissue is damaged along with attrition of vitamin D receptors⁸ even though bones, muscles, adipose tissue, and aging appear to be interconnected physiologically underpinnings in this regard.⁹

Drawn largely from the **PUBMED**, database, the largest medically oriented data base, the overview aimed to provide the interested reader a general view of past work as well as current trends and gaps as well as opportunities in this regard that might be worthy of further consideration and study, as well as serving as viable applications in the health care field.

The focus was on osteoarthritis, which may occur independently as a separate health condition, or in conjunction with one or more chronic health conditions, and may well be an enormous activity obstacle and deterrent to successful aging goals due to its many adverse impacts on life quality and functioning, including immense socioeconomic losses. While the world awaits a possible antidote in this regard, mounting evidence points to a possible role for vitamin D in fostering the maintenance of muscle strength and mass across the lifespan

with a view to offsetting or minimizing deleterious age associated bone and muscle mass losses that could involve calcium associated muscle deficits.¹⁰

Although research in this realm is limited and based largely on observational studies considered non conclusive, older adults with sarcopenia are at risk for osteoarthritis and more unfavourable outcomes than desired.⁶ Moreover, adults with low vitamin D plasma levels not only appear to be vulnerable to those muscle mass losses implicated in sarcopenia, but to bone health deficits found in various osteoarthritis subgroups. Indeed, as well as fostering functional declines a systematic analysis conducted in 2024 revealed the association of age-related losses of muscle mass was the most characteristic muscle feature associated with an increased risk of developing knee osteoarthritis. However, since muscle is mutable, it can be argued that a significant proportion of age-associated sarcopenic neuromuscular manifestations may be preventable. Thus, apart from pharmaceutical interventions, many studies have focused on non-pharmaceutical approaches for the prevention of osteoporosis and sarcopenia with exercise and nutrition being the most important and well-studied of those.¹¹

The purpose of the current narrative review is to describe the possible role of vitamin D on the prevention of sarcopenia in older adults at risk for osteoarthritis.

As such, if found to be influential in any way, intervention in this regard may provide one avenue that is reasonably practical for purposes of securing the well-being of the aging person, especially in the case of the chronically ill older adult that alone limits their mobility as well as their cognitive health. Others may be given medications that render them more prone to undesirable joint impacts, and less likely to be 'good' surgical candidates, especially if vitamin D is deficient.

This work is significant because the ability to minimize osteoarthritis severity is currently of the highest importance, especially among those older adults confined to their homes in isolation, as well as nursing homes, or to situations that limit sunlight and nutrient based vitamin D exposure. As discussed by Abiri¹² the role of vitamin D in skeletal muscle metabolism indicates it may have multiple impacts on this tissue such as muscle fiber metabolism, size, and pathology, and an elevated risk of chronic musculoskeletal pain, sarcopenia, and falls if deficient.

Aims

This narrative review aimed to specifically examine the value of vitamin D therapy for or minimizing the risk of acquiring and suffering from progressive bouts of osteoarthritis pain widespread in the older population, especially among those with preexisting vitamin D deficits. Its second aim was to

offer recommendations for future consideration by clinicians and researchers in the field based on these findings.

Materials and Methods

To obtain the data for this review, the electronic data source PubMed, was searched. The time period searched ranged from January 1 2020- May 31 2025 and the key words included *muscle mass, osteoarthritis, sarcopenia, vitamin D, older adults*. All forms of study or analysis were deemed acceptable. However, because many empirical studies are strictly in the proposal stage, or in process, unpublished, solely tentative or hypothetical, only a narrative overview of selected data was implemented. Selected material had to focus on vitamin D related facts relevant to muscle mass attrition, prevention, mitigation or improvement, osteoarthritis risk and recovery, as well as its symptoms as occurs in the older adult population at risk for sarcopenia. Excluded were articles that did not focus specifically on this set of issues, study proposals, preprints and non English based articles.

Results

Of the many publications that are listed as of January, 2020, articles potentially relevant to the current topic were retrieved after a careful examination of their contents. In terms of the topic specifically sought, however, most publications that initially appeared potentially relevant most did not meet criterion either for this review or any overall synthesis, for example many listings were themselves systematic analyses extracted from secondary data rather than actual current research. Moreover, many were not based on prospective or targeted studies of the older adult with forms of osteoarthritis other than the knee and hip, and even then were observational studies with dubious measurement tools, methods, and unknown properties. These were also generally non uniform in multiple design respects and a large percentage tended to be exploratory or atheoretical. Most too, focused on the role of age in sarcopenia and vitamin D when studied in this realm as deduced from multidimensional intervention perspectives such that its unique impacts could not be clearly discerned. In particular, among the available publications related to sarcopenia and vitamin D the majority do not currently reveal consistent or irrefutable conclusions.¹³⁻¹⁵

To provide an overview of this quite considerable but potentially highly relevant material in this regard, this mini review chose to discuss the science base and basis as regards vitamin D as a possible form of prevention and/or therapy relative to muscle mass losses and osteoarthritis among older adults. The term vitamin D is applied throughout, even though several formulae and categories of this compound exist.

Prior studies

Aging populations and their common declines in wellbeing and challenges have been examined for some time. In this regard, past research shows that many aging adults who have a high risk of incurring sarcopenia and related muscle mass and strength declines^{16,17} often go on to manifest severe osteoarthritis.¹⁸ A disease with enormous disabling features in its own right, such as sarcopenic obesity, where lean muscle mass is replaced by fat,¹⁹ many with this painful disabling condition are also potentially obese and often reluctant to exercise even if this is advocated. They may be prone to a genetically determined source of vitamin D receptor limitation that is hard to identify^{20,21} and may incur a state of decreasing physical abilities and potential excess vitamin D deficiencies if they remain socially isolated and unable to spend time outdoors with a resultant increased risk of muscle weakness and fatigue following or during long duration activities, and liable to possible falls and other injuries, as well as an emergent low life quality experiences especially among those with sizeable muscle atrophy features.^{20,22,23} In this regard, in many cases, especially those who are malnourished²⁴ as well as for those who may be vitamin D compromised this situation may be important to rectify because it may have some bearing on the degree to which muscle strength and mass is impacted adversely or not. There may also be a decline in the ability to take up vitamin D at the muscle level if the nuclear vitamin D receptors in muscles are compromised in some way, for example by direct injury or if the older adult suffers from mal-absorption problems.

Despite many research flaws and divergent observations that lack of precision, this aforementioned array of associations appears to be noteworthy and of considerable potential to untangle, given that skeletal muscle, the largest organ in the body accounts for approximately 40% of body weight, and plays important roles in daily function and is vital for healthy joint maintenance. In the aging population, there is however, often a progressive decline in skeletal muscle mass and function, a condition known as sarcopenia, which can lead to bedridden conditions, wheelchair confinement, as well as a reduced quality of life, falls, injuries, and progressive increases in suffering,¹⁷ but is possibly amenable to palliation by vitamin D, a fat-soluble vitamin and other strategies.¹⁶

As noted by Sutherland²⁵ the presence of a vitamin D deficiency is found in conjunction with muscle disorders, including those that accompany skeletal muscle performance declines and osteosarcopenia, falls and fractures, and osteoarthritis.²⁶ In addition, vitamin D receptor knockout mice studies further confirm a relationship between vitamin D and skeletal muscle that may be trauma as well as disease related.

Current reports

Among studies and reports retrieved from the present search, it appears osteoarthritis and sarcopenia are indeed associated.²⁷ In some cases, the condition is however associated both with frailty²⁸ as well as obesity²⁹ and when present impacts osteoarthritis joint biomechanics,²⁹ degenerative spinal stenosis in the absence of any associated paraspinal muscle fatty tissue infiltration,³⁰ as well as fostering detrimental hand osteoarthritis functional declines and outcomes and presentation.³¹

Wu⁶ note sarcopenia is significantly and longitudinally associated with both radiographic and symptomatic progression in knee osteoarthritis and subsequent knee replacement surgery. It is similarly associated with balance and gait function in hip osteoarthritis.³² Data calculations by Liu³³ further imply osteosarcopenia, osteoarthritis and frailty exhibit significant causal risk effects for frailty. As such, they advocate that in clinical practice, patients with osteosarcopenia and osteoarthritis should be required to undergo relevant interventions and especially to reduce the risk of frailty.³³ A significant apparent bi directional association between sarcopenia and femoral cartilage thickness and knee osteoarthritis is also reported to have a possible mechanical influence on the disease processes and should not be ignored.³⁴ As well as increasing the risk for symptomatic knee osteoarthritis,³⁵ Yang³⁶ state the presence of sarcopenia may impact muscle joint interactions negatively including its ability to support the joint, as well as through its systemic inflammation, and muscle-derived myokine related impacts. On the other hand, while knee pain and knee osteoarthritis may raise the risk of incurring future sarcopenia,³⁷ it appears a state of sarcopenic obesity can be observed after efforts to surgically replace the diseased hip joint.³⁸

As Grosman³⁹ notes it appears important to stress and appreciate this issue is complex because it implicates a complex bidirectional cyclical relationship between sarcopenia and musculoskeletal pain as occurs in osteoarthritis. This potentially includes many shared muscle related mechanisms, including muscle inflammation and weakness, vitamin D receptor pathology, the replacement of muscle tissue by fatty tissue, lowered joint protection, pain and psychosocial factors such as depression and social isolation, which underlie the mutual exacerbation between conditions, even if an exercise oriented preventive role is indicated.

In this regard, Remelli²³ who affirm a role for vitamin D in the context of skeletal muscle and attribute this to its possible role as a 'hormone' that can stimulate the proliferation and differentiation of skeletal muscle fibers, stresses its importance of potentially helping to maintain and improve muscle strength and physical performance even in the face of ageing, osteoarthritis, and muscle attrition. Although this proposed interaction is not deemed to be universally causative, or indeed valid,⁴⁰ older persons who are at risk for

muscle mass losses that are functionally impairing in many cases do appear to have a higher prevalence of low vitamin D levels. This may involve remediable factors such as a low dietary vitamin D intake, a reduced exposure to ultraviolet irradiation of the skin, and especially if osteoarthritis pain reduces their outdoor activities. Those at risk for sarcopenia, a geriatric syndrome characterized by the progressive loss of skeletal muscle mass and strength often complicated by adverse events, such as falls, disability hospitalization and death should be targeted early on by all providers who seek to minimize structural joint degradation processes that impair function and mar life quality.

Sutherland²⁵ who support a causal relationship between vitamin D and skeletal muscle health suggest that to lower the risk of sarcopenic obesity, likely to be present in high numbers of osteoarthritis sufferers, efforts to ensure optimal vitamin D-levels may help to some degree. Wang¹⁵ further report that vitamin D supplementation is indicated even in the case of joint replacement surgery to enable muscle recovery and desirably optimal functional outcomes and strongly advocate for tailored supplementation strategies, based on patient-specific needs and surgical context in this regard to optimize recovery, including the maintenance of bone structure and function,⁴¹ and allaying excess pain transmission and dysfunction.^{42,43} Indeed, vitamin D supplements applied for six months in a clinical sample of osteoarthritis cases reduced oxidative protein damage, as well as pain, and improved quality of life, grip strength and physical performance.⁴⁴

On the other hand, Montemor and colleagues⁴⁵ affirm reduced levels of vitamin D are associated with more severe cases of hip and knee osteoarthritis, increased pain, greater functional impairment, and elevated serum levels of inflammatory indicators TNF- α and IL-6. Thus, this group has advocated for further research to investigate how vitamin D affects muscle function, muscle cell proliferation, differentiation, and key signaling pathways. Additionally, they implied further research could help establish reasons for the finding of inconsistent relationships between vitamin D and a salient observable muscle effect in humans.⁴⁶ Variability in substrate studied, supplementation need and dosage, duration, mode, and baseline vitamin D levels that may contribute to these inconsistencies was also cited as requiring more in-depth precise study.

The correlates of vitamin D among older functionally disabled, obese adults with dark skins, frailty disorders, and others that may preclude adequate sunlight exposure also warrant examination in their own right in our view. Sunlight exposure may also be limited by lockdowns or

institutionalization, as well as multiple functional and economic disabilities and challenges that need to be identified and mitigated, if possible, as well.

In the meantime, it is yet conceivable that what we do know in this realm can help to markedly reduce the impact the severity, onset, or progression of sarcopenia in older adults, if not its incidence. In addition, possible benefits on overall health status, mobility, as well as the neuromuscular junction and muscle regeneration may provide for a population-wide cost-effective manner of mitigating excess suffering, including osteoarthritis, even though unsupported by some, or at present, by any 'gold standard' research approach.⁴⁷

Mechanisms of vitamin D action however, are quite well studied and their careful examination among healthy older adults, as well as clearly defined sub groups of high and low risk older adults along with cell-based studies is strongly advocated to enlarge upon this in current times. Other topics that might prove fruitful if examined more intently in our view are its specific impact on muscle fiber genetics, forces, inflammation, losses, pain and other osteoarthritis sarcopenic associated outcome correlates such as the replacement of muscle mass by fat mass.

Moreover, more attention to defining what constitutes a vitamin D sufficiency or deficit, plus the vitamin D dosages that would possibly prove impactful in preventing muscle mass declines among various older adults at risk for osteoarthritis and sarcopenia warrants more attention. At the same time, greater efforts towards controlling for current medication and supplement usage, mode and frequency of evaluation, as well as possible nutritional factors, and sunlight exposure in forthcoming studies is essential. In addition, the influential role of gender, pain, disease severity, health status, nutrient access, form of vitamin D employed as a supplement, the role of genetics, and others in mediating both vitamin D serum levels and uptake in muscle as well as skin and body organs, as well as possibly osteoarthritis outcomes warrants careful additional consideration in our view.

Until then and since no definitive predictable vitamin D influence on muscle atrophy is likely to emerge in the near future, and may depend on the individual's genetic predisposition and personal profile, these attributes should be sought routinely and comprehensively when attempting to develop effective as well as cost effective individual preventive interventions⁴⁸ even if somewhat disputed.⁴⁹

State of the research

What can be gleaned from the presently retrieved sources of peer reviewed information on osteoarthritis, sarcopenia, and vitamin D, all mediators or moderators of healthy aging? As

noted above, cumulative literature reviews, anecdotal or observational reports, although warranting careful future research, all speak to the complexity of their interactive impacts that are not yet clearly discernable. Even where promising,⁵⁰ a need for future study is echoed by most current researchers. However, most concur that carefully tailored and targeted practical and empirically supported preventive approaches will be more helpful than any standardized universal 'one size fits all' approach. However, rather than delaying all actions until then, the clinician is encouraged to rely on their skill and expert judgment and ability to examine their client's specific situation and advance a tailored action plan.

Indeed, it can be assumed that sarcopenia is progressive, as is osteoarthritis, and low vitamin D levels often reduce years of healthy life and mobility, thus 'waiting' for 'new' or AI science of high caliber to emerge may not be wise. This is because sufficient data show much harm can be done by ignoring the possible successes and directives that have been observed to date, as well as by failing to appreciate the complexity of what we do know about the triadic sarcopenia, osteoarthritis, vitamin D associations.

In particular, despite a lack of consensus, as discussed by Zhang⁵¹ vitamin D, an essential fat-soluble vitamin found pivotal in skeletal muscle health is likely to be a significant risk factor for the development of sarcopenia in many older adults, and possibly thereby to osteoarthritis, a condition closely tied to muscle mass declines locally and often systemically in obese cases. In addition to that, several studies have demonstrated that those deemed sarcopenic can be expected to experience those physical attributes found to be subnormal in osteoarthritis, such as joint instability and pain.

In this regard, while sarcopenia may occur regardless of any vitamin D deficit, it appears a combination of nutritional approaches, exercise, and pharmacological interventions hold promise presently for countering excess muscle attrition, regardless of cause. It is possible too vitamin D when applied as a supplement either alone or in combination with existing analgesics is better able to treat chronic pain, the most profound complaint of cases suffering osteoarthritis, than not.⁴³

To this end, large-scale clinical trials of disease sub groups may prove fruitful, as may testing the value of combining vitamin D with other nutrients as well as resistance training because older adults who are affected most by osteoarthritis are more likely than not to be vitamin D deficient, as well as experience generally worse outcomes if they also suffer from sarcopenia.

Promising Evidence Based Treatment Approaches

In addition to lifestyle changes⁵² emergent research implies it may be helpful to focus on nutrition⁶² and healthy eating and their presumptive vitamin D enhancing anti-sarcopenic effects^{53,54} as follows by:

1. Applying a 13-week intervention of a vitamin D and leucine-enriched whey protein oral nutritional supplement to sarcopenic adults, geriatric patients, and those unable to exercise.⁵⁵
2. Applying the combined supplementation of whey protein, vitamin D and E to significantly improve muscle strength, and anabolic inflammatory markers in older adults with sarcopenia.²²
3. Applying some dietary approaches such as adequate intake of protein, vitamin D, antioxidant nutrients, and long-chain polyunsaturated fatty acid against sarcopenia.¹
4. Applying curcumin and vitamin D supplements concurrently to delay osteoarthritis progression and associated pain.⁵⁶
5. Applying supplementation with whey protein, essential amino acids, and vitamin D, in conjunction with age-appropriate exercise to boost fat-free mass and strength and that contribute to well-being in sarcopenic elderly.⁵⁷
6. Applying Resveratrol and vitamin D supplementation for optimizing treatment outcomes, ensuring muscle function recovery, and improving the quality of life for patients.⁷
7. Applying a combined program of exercise with protein and vitamin D-enriched meal improves serum vitamin D levels and skeletal muscle mass among older Japanese men.⁵⁸
8. Applying a Mediterranean low-calorie diet and supplementation with certain micronutrients such as vitamin D, essential and non-essential amino acids, as well as whey protein, appear beneficial in sarcopenic obesity and osteoarthritis.⁵⁹

These practical approaches and others should preferably be selected only following a comprehensive screening protocol to ascertain what strategies, if any, are indicated for a given individual.^{39,59} Future research should however be forthcoming to solidify what has been observed and to determine optimal dosing and combination regimens and their possible anti-sarcopenic long-term impacts in diverse young as well as older adult populations.^{17,60}

Discussion

Although modern medicine has been quite successful in managing many acute health conditions and reducing

infection and injury risk and magnitude in the older adult population, no similar simple solution prevails against osteoarthritis. This is especially true among those older adults who are possibly either over- or underweight, and at risk for sarcopenia^{4,52,61} a muscle condition characterized by declines in muscle mass and fiber structures, strength, and force quality, plus functional losses. There may also be associated emergent signs of possible cognitive impairments, frailty, bone fragility, balance deficits, recurrent falls, and even increased mortality⁵⁴ and risk of acquiring osteoarthritis.⁶²⁻⁶⁵ In particular, those who are in pain may be at high risk,⁶⁵ as may those who are malnourished and / or depressed⁶⁵ and unable or not likely to spend time outdoors, and may suffer unduly from parallel deficits in vitamin D.

Whether vitamin D supplementation could be especially important for older people in this regard, as they are at high risk of poor outcomes joint surgery in the case of any accompanying vitamin D deficiency and may not be able to spend time outdoors or access foods with vitamin D readily this topic should be studied more intently in our estimation. The correlates of vitamin D among older functionally disabled, obese adults with dark skins, frailty disorders, and others that preclude adequate sunlight exposure also warrant examination in their own right. Sunlight exposure may also be limited not only by lockdowns or institutionalization, but by multiple functional and economic inabilities and challenges that need to be identified and mitigated if possible.

In the interim, it appears confirmatory research and new knowledge in this realm can help to markedly reduce the impact of the severity of sarcopenia in older adults, and possibly its prevalence and virulence, along with possible wide-reaching benefits that impact on the overall osteoarthritis rising epidemic in a practical manner, even though not supported by some, or any current 'gold standard' research or unified approach.

Mechanisms of vitamin D action however, while quite well studied in the past, clearly warrant careful examination of these proposed pathways of impact and interaction not only among affected older adults, but also among clearly defined sub groups of high and low risk older adults and osteoarthritis manifestations. Others topics that might prove fruitful if examined more intently are obesity and muscle associated inflammation, pain and other osteoarthritis and sarcopenic associated outcome correlates and mechanism of action.

Moreover, in addition to possible dysfunction of vitamin D muscle receptors, since the vitamin D dosages that would possibly prove impactful among various older adults at risk for osteoarthritis are basically not well established at all, and are possibly too high or too low in various cases, more attention to this issue appears indicated. At the same time,

greater efforts towards controlling for current medication and supplement usage, mode and frequency of evaluation in clinical studies, as well as possible sunlight exposure, and/or pollution levels in the outdoor environment, is essential. In addition, the influential role of pain, disease severity, health status, nutrient intake and access, form of vitamin D used as a supplement, and other conditions such as injury and depression in mediating both vitamin D serum levels, as well as possibly osteoarthritis outcomes warrant careful additional consideration in our view.

Key conclusions

In spite of this being a very limited solely descriptive overview of only three pre-selected topics, namely- *Sarcopenia*, *Osteoarthritis*, and *Vitamin D*, we conclude:

- 1) Older adults, and those at risk for excess reactive or age associated muscle atrophy declines or both may suffer in multiple ways if early evaluations are not undertaken to detect these issues;
- 2) Low vitamin D levels, representing a controversial level of influence among the current issues examined herein appears to have the potential to adversely impact innate as well as adaptive muscle attrition processes and bone health as observed in osteoarthritis, all data considered;⁶⁶⁻⁶⁹
- 3) While not definitive, vitamin D and its adequate presence appears highly promising as an adjunctive approach conferring some degree of influence in preventing and ameliorating the magnitude of muscle mass declines and attrition and osteoarthritis disease severity even in cases that undergo joint replacement surgery;
- 4) Securing an ample or desired level of circulating vitamin D as regards muscle health appears to be one factor that may yet help to protect against excess joint damage and injury, especially among the older adult population, who are often obese, or frail as well as vitamin D deficient.

In the interim, concerted efforts to make available and implement local vitamin D and anti-inflammatory approaches, where access to sunlight is not a given,^{17,70} there may be a negatively altered parathyroid hormone level, and lipid dysregulation⁷¹ and the vitamin D muscle receptors may be damaged.⁷² Its benefits alone on averting cartilage damage, including inflammation, may be of high import in mitigating those reactive disease impacts that arise in the surrounding muscles, and the possible onset or progression of sarcopenic obesity.⁷³⁻⁷⁵

However, to advance this field successfully, and arrive at some consensus re- vitamin D supplementation, well-powered and carefully conceived long term clinical, as well as epidemiological and basically oriented studies that employ advanced technologies are sorely needed and strongly encouraged.

Final comments

While many basic studies indicate vitamin D's crucial role in muscle growth, muscle cross-sectional area maintenance and repair, nerve function and protection as well as calcium regulation, several observational, and intervention studies do not show clear benefits of maintaining optimal vitamin D levels as far as being a muscle mass mediator in the human situation. Moreover, although some indicate vitamin D does impact muscle health, it is said to be an insufficient factor when considering sarcopenia prevention and management.⁶⁰

Supplements may work sporadically because some may not raise vitamin D levels sufficiently and rapidly though and must be sustained for several months to reach the desired serum level of vitamin D and thus this possibility may not be studied. As well, even then, its presence cannot alter muscle structure instantaneously and possibly requires time on associated tasks when over counter sources are employed such as healthy eating and in the case of osteoarthritis pain management, resistive exercises, and constant joint protection.

Acknowledgement

None

Funding

None

Conflicts of Interest

The author declares no conflict of interest.

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