

## World Congress on Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (WCO-IOF-ESCEO 2021): ESCEO-IOF Symposium Abstracts

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### ESCEO-IOF1

#### PREVALENCE OF VITAMIN D SUFFICIENCY/DEFICIENCY IN PATIENTS ADMITTED TO THE ORTHOPAEDIC WARD

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This presentation will address the determinants of 25-hydroxyvitamin D levels in patients admitted to the orthopaedic ward and the evidence pertaining to such measures as assessed on admission. Thus, a range of factors, such as ethnicity, latitude/season and obesity, all influence 25-hydroxyvitamin D levels. It is also recognised that there are substantial differences between laboratory assays used to measure 25-hydroxyvitamin D concentrations, making comparison of study findings problematic. Most recently, evidence has emerged that 25-hydroxyvitamin D may be a negative acute phase reactant with levels decreasing after acute infection in animal experiments and after arthroplasty in humans. Several studies have examined 25-hydroxyvitamin D concentrations in patients admitted for fracture repair. The heterogeneity in populations, geographical location and assays used means that detailed comparison is difficult, but overall, they suggest that a substantial proportion of such patients have low levels of 25-hydroxyvitamin D, with potential adverse consequences for rehabilitation and future bone health.

### ESCEO-IOF2

#### BENEFITS OF VITAMIN D IN PATIENTS WITH FRAGILITY FRACTURE

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**Objective(s):** Vitamin D supplementation has been widely recommended for the prevention of osteoporosis and subsequent fractures; its actual role, however, on patients with fragility fractures, is under investigation.

**Material and methods:** An expert working group was convened in September 2020 under the auspices of the European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO) and reviewed the literature and presented the current state of the art on the topic of vitamin D administration in patients with fragility fracture, with regard to fracture healing and material osseointegration.

**Results:** The effects of vitamin D supplementation on fracture healing remain controversial. Vitamin D deficiency can adversely affect fracture healing and conceivably contribute to the development of nonunion. As mechanism for nonunion, impaired IL-4 and IL-13 production under vitamin D deficiency has been proposed. A high-dose bolus of

vitamin D3 during the acute recovery period does not impact the rate of union of vitamin D deficient patients with a long bone fracture.

There seems to exist a lower bone to implant contact and impaired functional osseointegration in vitamin deficient animals. A clear association between hypovitaminosis D and impaired osseointegration, with a higher probability of early implant failure, is reported in both clinical and animal studies. Both in the frail elderly and younger patients, in the presence of traumatic fractures, hypovitaminosis D is associated with worse bone stock and delay in the formation of callus and healing. Vitamin D promotes mineralization and bone repair processes. Low vitamin D levels are also associated with increased exposure to infections, longer length of hospital stay, and higher frequency of post-operative complications. Retrospective clinical studies suggest some trend to early dental implant failure in patients with low circulating 25OHD.

**Conclusion(s):** The effects of vitamin D deficiency and/or supplementation on fracture healing in clinical studies are rare. The overall impression is that vitamin D has a positive influence on this process, but the mechanism and the magnitude of the effect remain to be determined. The role of vitamin D in material osseointegration requires further investigation.

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### ESCEO-IOF3

#### SUPPLEMENTATION WITH VITAMIN D DURING REHABILITATION

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Vitamin D has a critical role for the functional recovery in patients with fragility fractures, and its supplementation is recommended by international guidelines in this population. Patients treated with anti-osteoporotic drugs and calcium/vitamin D supplementation have significant reduction of risk for subsequent fracture and mortality compared to those treated with anti-osteoporotic drugs alone [1]. Nevertheless, only 10% commonly receive vitamin D supplementation at admission in acute care [2] and less than 20% have a prescription of supplementation after hospitalization for hip fracture [3]. In addition, vitamin D has significant benefits for muscle health with consequent improvement of physical performance and, in combination with exercise, significantly improves muscle strength in older patients [4]. Considering the criticism of ensuring adequate vitamin D supplementation in orthopedic/trauma care units, rehabilitation setting could be a key moment for the prescription and administration of vitamin D in order to normalize serum 25(OH) D and enhance functional recovery of patients with hip fractures.

- [1] Degli Esposti L, Girardi A, Saragoni S, Sella S, Andretta M, Rossini M, Giannini S; on the behalf of the Study group. Use of anti-osteoporotic drugs and calcium/vitamin D in patients with fragility fractures: impact on re-fracture and mortality risk. *Endocrine*. 2019 May;64(2):367-377. <https://doi.org/10.1007/s12020-018-1824-9>. Epub 2018 Dec 4. PMID: 30515678.
- [2] Bischoff-Ferrari HA, Can U, Staehelin HB, Platz A, Henschkowski J, Michel BA, Dawson-Hughes B, Theiler R. Severe vitamin D deficiency in Swiss hip fracture patients. *Bone*. 2008 Mar;42(3):597-602. <https://doi.org/10.1016/j.bone.2007.10.026>. Epub 2007 Nov 28. PMID: 18180211.
- [3] Gonnelli S, Caffarelli C, Iolascon G, Bertoldo F, Letizia Mauro G, Patti A, Nuti R. Prescription of anti-osteoporosis medications after hospitalization for hip fracture: a multicentre Italian survey. *Aging Clin Exp Res*. 2017 Oct;29(5):1031-1037. <https://doi.org/10.1007/s40520-016-0681-8>. Epub 2016 Dec 9. PMID: 27943127.
- [4] Antoniak AE, Greig CA. The effect of combined resistance exercise training and vitamin D3 supplementation on musculoskeletal health and function in older adults: a systematic review and meta-analysis. *BMJ Open*. 2017 Jul 20;7(7):e014619. <https://doi.org/10.1136/bmjopen-2016-014619>. PMID: 28729308; PMCID: PMC5541589.