D-Essence
Medical Insights on Vitamin D

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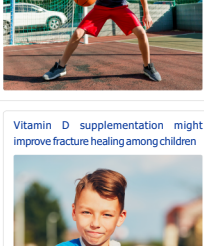
Vitamin D is critical in regulating bone remodeling processes, calcium absorption and maintaining the skeletal muscle system. Vitamin D levels in both children and adults are becoming the subject of research more often as its insufficiency is linked to juvenile arthritis in children & adolescents and several bone & joint diseases in adults. Fermenta, a leading manufacturer of Vitamin D, presents this D-Essence Newsletter to highlight the latest research on the Role of Vitamin D in Bone and Joint Health.

Vitamin D supplementation can be a targeted therapy in juvenile idiopathic arthritis

Vitamin D levels were assessed in a systematic review and meta-analysis of 10 studies with 5,542 participants, consisting of those diagnosed with juvenile idiopathic arthritis (JIA) and healthy children as control. Overall, patients with JIA had a lower mean Vitamin D level of 22.8 ng/mL compared to controls with a mean level of 26.2 ng/mL. The subsequent random-effects model found an overall effect size (standardized mean difference) of -0.49, signifying a statistically significant association between Vitamin D and JIA. Vitamin D may be a modifiable risk factor for JIA that can be targeted for therapy.



Zang-Ket al. Nutr Rev. 2025 Jul 1;83(7):e1362-e1371

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Low Vitamin D is possibly related to higher disease activity & lesser muscle mass in juvenile arthritis

A cross-sectional study investigated the association of Vitamin D with disease activity, muscle mass and physical activity in 70 young adults with juvenile idiopathic arthritis (JIA). Around 94% JIA patients had Vitamin D deficiency (63%) or insufficiency (31%). Patients with low Vitamin D had 3-fold significantly higher disease activity as indicated by the Juvenile Arthritis Disease Activity Score (JADAS27). In terms of muscle indicators, those with low Vitamin D had 6.3 kgs, 3.8 kgs, 1.3 kg/m^2 and 4 kgs of lesser total & appendicular lean mass, skeletal muscle mass index and handgrip strength, respectively. Vitamin D deficiency was also related to poor physical activity level among JIA patients.

Kulyk M et al. Proceedings of the Shevchenko Scientific Society. Medical Sciences. 2024;(2(76)

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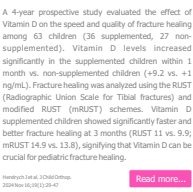
Vitamin D supplementation might improve fracture healing among children



A 4-year prospective study evaluated the effect of Vitamin D on the speed and quality of fracture healing among 63 children (36 supplemented, 27 non-supplemented). Vitamin D levels increased significantly in the supplemented children within 1 month vs. non-supplemented children (+9.2 vs. +1 ng/mL). Fracture healing was analyzed using the RUST (Radiographic Union Scale for Tibial fractures) and modified RUST (mRUST) schemes. Vitamin D supplemented children showed significantly faster and better fracture healing at 3 months (RUST 11 vs. 9.9; mRUST 14.9 vs. 13.8), signifying that Vitamin D can be crucial for pediatric fracture healing.

Hendrych J et al. J Child Orthop. 2024 Nov 16;19(1):28-47

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