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Novel biomarker for early diagnosis of cancer cachexia

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Background: Vitamin D deficiency is common among athletes depending on their skin color, geographic region and indoor exercise time. Vitamin D is a vital component in biological reactions in human. Scientific articles have shown that vitamin D supplementation has positive effects on athletes' performance. Besides that, omega-3 fatty acids (FA) play supportive role on athlete's cardio-vascular system.

Objectives: The purpose of this review article was to evaluate the effect of vitamin D and omega-3 FA supplementation on muscles, aerobic capacity, exercise performance and cardio-vascular system in athletes.

Methods: Among the total 40 articles including entrance criteria, 19 articles including 13 original and 6 review articles were analyzed.

Results: Vitamin D plays important roles in synthesis of proteins, hormones, gene expression regulation and muscular performance. Vitamin D deficiency is common among athletes which increases the risk of fractures, inflammation, infection and prolonged recovery time. Furthermore, vitamin D increases calcium availability and improves cross bridge cycle and muscular contractions. Decreased level of vitamin D lower than 30 nmol/lit leads to reduced exercise power and increases the risk of infections, in contrast, level higher than 80 nmol/lit results lower risk of inflammation. Omega-3 FAs improves cardio-vascular function via nitric oxide production and also leads to less total oxygen consumption, lower heart rate and muscular oxygen requirement. Researchers have suggested that omega-3 FAs supplementation increases the level of Ecosapanthanoic acid (EPA) in erythrocytes and decreases the peroxidative erythrocyte's protein destruction which results in oxidative balance.

Conclusions: Vitamin D and omega-3 FAs supplementation have beneficial effects on athletes performance and doses higher than physiological daily intake may be needed according to increased requirement and deficiency prevalence in athletes.

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