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The Physiological/Pathophysiological Significance of Vitamin D in Cancer, Cardiovascular Disorders and Beyond

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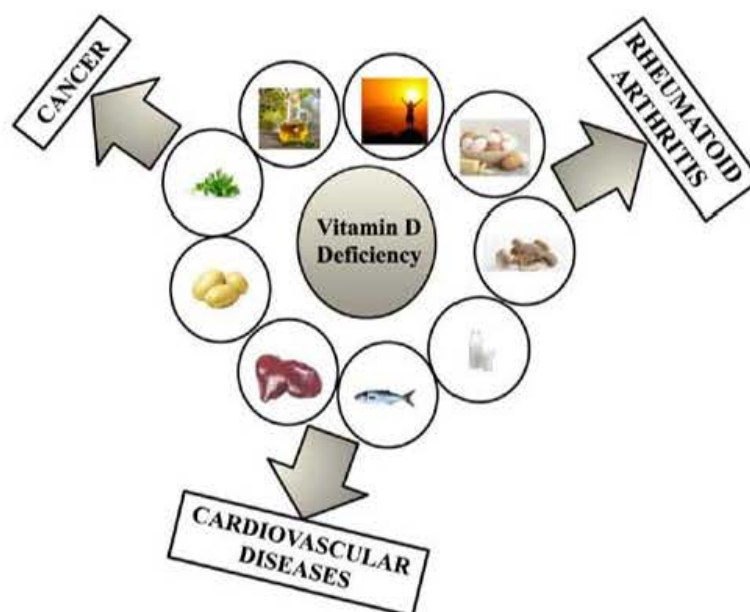
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Graphical Abstract:



Abstract:

Background: Vitamin D, a molecular precursor of the potent steroid hormone calcitriol, has crucial functions and roles in physiology and pathophysiology. Tellingly, calcitriol has been shown to regulate various cellular signalling networks and cascades that have crucial role in cancer biology and diagnostics. Mounting lines of evidences from previous clinical and preclinical investigations indicate that the deficiency of vitamin D may contribute to the carcinogenesis risk. Concomitantly, recent reports suggested that significant reduction in the cancer occurrence and progression is more likely to appear after vitamin D supplementation. Furthermore, a pivotal role functioned by vitamin D in cardiovascular physiology indicates that the deficiency of vitamin D is significantly correlated with enhanced prevalence of stroke, hypertension and myocardial infarction. Notably, vitamin D status is more likely to be used as a lifestyle biomarker, since poor and unhealthy lifestyles are correlated with the deficiency of vitamin D, a feature which may result in cardiovascular complications. Moreover, recent reports revealed that the effect of vitamin D is to cover not only cardiovascular system but also skeletal system.

Objective: Herein, we are highlighting the recent knowledge of vitamin D roles and functions with respect to pathophysiological disorders such as cancer, cardiovascular diseases, rheumatoid arthritis (RA) and debate the potential avails of vitamin D on slowing cancer, cardiovascular disease and RA progression.

Conclusion: The findings of this review confirm that the importance of vitamin D metabolites or analogues which can provide a helpful platform to target some kinds of cancer, particularly when used in combination with existing therapies. Moreover, the correlation between vitamin D deficiencies with cardiovascular diseases and rheumatoid arthritis (RA) progression might suggest a pivotal role of vitamin D in either initiation or progression of these diseases.

Keywords: [Vitamin D](#), [cancer](#), [cardiovascular diseases](#), [rheumatoid arthritis \(RA\)](#), [clinical trials](#), [therapeutic agent](#)