



# Vitamin D and cancer; a contradictory problem

Masoud Amiri\*

Department of Epidemiology and Biostatistics, Shahrekord University of Medical Sciences, Shahrekord, Iran

## \*Correspondence to

Masoud Amiri, PhD;  
Email: masoud.amiri@yahoo.com

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## Abstract

Vitamin D has been reported as an essential factor for bone health as well as a protective factor for many cancers, with potential effect of the pandemic situation of vitamin D deficiency worldwide. Vitamin D could affect every cell in the human body. Living at higher latitudes and having vitamin D deficiency could result in increasing risk of common fatal cancers. Enough intake of vitamin D could have a beneficial influence on some cancers such as cancers of colon, breast, prostate, pancreatic and ovarian. Both observational and experimental epidemiologic studies have reported that higher intakes of vitamin D are related to lower risk of cancer.

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Vitamin D has been reported as an essential factor for bone health as well as a protective factor for many cancers, with potential effect of the pandemic situation of vitamin D deficiency worldwide (1). Vitamin D could also affect every cell in the human body (2). In addition, epidemiologic studies have shown that living at higher latitudes (3) and having vitamin D deficiency could result in increasing risk of common fatal cancers (4,5). Moreover, enough intake of vitamin D could have a beneficial influence on some cancers (6) such as cancers of colon (7), breast (8), prostate (9), pancreatic (10) and ovarian (11). Nowadays, there is a pandemic of obesity worldwide (12) and almost one-fifth of all cancers might cause by obesity (13). There is a relationship between obesity and low intake of vitamin D (13). In the following paragraphs, the association of vitamin D with some cancers will be discussed.

Breast cancer is the most common cancer among women all around the world (14). This cancer is also related to other chronic diseases such as type 2 diabetes (15) and cardiovascular diseases (16). It has reported that the intake of normal range of vitamin D may decline the mortality from breast cancer (17). In fact, vitamin D has a substantial role to protect women from breast cancer (2) which has been found in other studies too (18).

Pancreatic cancer is one of the fatal cancers

## Key point

The intake of vitamin D might be needed to reduce cancer risk. Epidemiologic studies have reported that higher intakes of vitamin D are related to lower risk of many cancers. It is recommended that with avoidance of deficiency from vitamin D and by adding supplements of vitamin D, in a safe and economic way, it is possible to decline the cancer incidence and mortality

(10). It is the fourth cause of cancer deaths in western countries and fifth worldwide (19). Its association with vitamin D is still controversial (19).

Prostate cancer is the most second fatal cancer among American men and the most common diagnosed cancer (9). Nutrition and physical activity are the most important factors to prevent prostate cancer (20). In addition, the relationship between vitamin D deficiency and increasing risk of prostate cancer has been found before (21). Moreover, it has been reported that limited exposure to sunlight and/or vitamin D deficiency are associated with increasing of incidence and mortality from many common tumors like prostate cancer (22). In fact, chronic vitamin D deficiency in young and middle age men may increase the risk of prostate cancer among them (23). Therefore, for the treatment of prostate cancer, using of vitamin D is very helpful. It is recommended

that sufficient vitamin D in nutrition will be a priority for men at all ages (24). However, there is a controversy about the dairy intake and prostate cancer; while some studies found an increase in mortality from prostate cancer (25,26), some others have found no relationship (27,28). Colon cancer mortality rates are higher in the areas with lower sunlight compared to sunny areas (29). Many epidemiologic studies have found that less amount of vitamin D intake is associated with higher risk of colon cancer (30). In addition, there is some evidence that in areas with less sunlight, the intake of vitamin D should be more than the normal amount (31). Moreover, higher intakes of total calcium and milk after, but not before diagnosis of disease, may also be related to less risk of death in colorectal patients (31). It should be noted that there is still some controversy on the exact effect of vitamin D in the prevention of colon cancer (32).

As a conclusion, previous studies have found that intake of vitamin D might be needed to reduce cancer risk (29,33). Both observational and experimental epidemiologic studies have reported that higher intakes of vitamin D are related to lower risk of cancer (34). Furthermore, it has been proved that daily intake of vitamin D up to 40 000 IU may not result in its toxicity (33). Although more studies are needed to clarify the long-term and short-term effects of high-dose of vitamin D intake (32). Finally, due to increasing of the risk of cancer by vitamin D deficiency, it is recommended that with avoidance of deficiency from vitamin D and by adding supplements of vitamin D, in a safe and economic way, it is possible to decline the cancer incidence and mortality (35).

#### Author's contribution

MA is the single author of the paper.

#### Conflicts of interest

The author declares no conflict of interest.

#### Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the author.

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