

## **VITAMIN D DEFICIENCY AND CANCER – A GROWING RISK OF CANCER**

**Spandana.K\* and Sudheerbabu.I**

Pharmacist, Eastren Street, Eluru-1, Eluru, Andhrapradesh, India.

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**\*Correspondence for  
Author**

**Spandana. K**

Pharmacist, Eastren Street,  
Eluru-1, Eluru,  
Andhrapradesh, India.

### **INTRODUCTION**

Cancer, also called malignancy is an abnormal growth of cells. These are more than 100 types. Few of them are caused due to the lack of sufficient levels of vitamin D – which was found by latest research. This deficiency may cause in some types of cancers like Breast cancer, Prostate cancer, colorectal cancer, papillary thyroid cancer, ovarian cancer, oral cancer.

### **ROLE OF VITAMIN D IN THE HUMAN BODY**

Vitamin D undergoes DNA repair & metabolic processes.

1. One of Dr. Holick's studies showed that healthy volunteers taking 2000 IUS of vitamin D per day for a month up regulated 291 different genes that control up to 80 different metabolic process. 2. This include improving DNA repair; having a beneficial effect on autoxidation (oxidation that occurs in the presence of O<sub>2</sub> & UV radiation, which has implications for aging and cancer).

### **Role of vitamin D deficiency and Risk of cancer**

Laboratory studies have shown that vitamin D deficiency can decrease communication between cells and leads them to stop sticking to one another, a condition that could cause cancer cells to spread. Compared with normal cells, cancer cells remain in an immature state and vitamin D appears to have a role in making cells mature. Vitamin D plays a role in regulating cellular reproduction which malfunctions in cancer. Higher levels of vitamin D lead to cellular adherence, maturation and communication between cells, all of which may lower cancer risk.

**VITAMIN D vs CANCER****FEW TYPES OF CANCER STUDIES AND REQUIRED LEVELS OF VITAMIN D**

These are the data that correlate high blood levels of vitamin D with a reduced risk of breast and colorectal cancers.

In **COLORECTAL CANCER**, calcium supplementation may also reduced the risk of polyps (non cancerous growths that may develop on the inner wall of the colon and rectum) and cancer. With or without calcium, vitamin D can be required. People with a personal history of these types of cancer and their relatives may wish to discuss supplementation with their doctor.

In 2007, American journal of preventive medicine, concluded that vitamin D level of more than 33ng/ml was associated with a 50% lower risk of colorectal cancer.

In **BREAST CANCER**, who are at higher levels of 25 (OH) D at the time of their diagnosis had a substantially lower risk of dying from their disease during the study periods, averaged about 10years.

1. Women with the highest levels around 30 ng/ml had a 44% lower risk, of dying from breast cancer than women with the lowest levels around 17 ng/ml.
2. There was a strong dose related response, meaning that higher vitamin D levels were consistently associated with reduced risk of cancer.

While the understanding of **OVARIAN CANCER** and treatments has greatly improved in recent years, what causes the disease remains unknown. Later, researchers found that as a group, ovarian cancer patients had significantly lower vitamin D<sub>3</sub> serum levels (12.5 ng/ml) than healthy women (22.4 ng/ml).

1. Ovarian cancer patients whose vitamin D blood serum was higher than 10ng/ml were more likely to realize a five year survival rate than those with a blood serum level lower than 10ng/ml.

**PAPILLARY THYROID CANCER** is the most common form of thyroid cancer, a type of cancer that occurs in the cells of the thyroid gland in the neck. Some patients were selected and followed the tests.

**RESEARCHERS FOUND**

1. Vitamin D levels were significantly higher in women younger than 45 years old and a tumor size of less than 1cm.
2. A linear trend was observed between decreasing vitamin D levels and increasing tumor size.

In conclusion, lower levels of vitamin D appears to be associated with poor clinical pathologic features with respect to PTC in female patients. Vitamin D is insufficiently may be a modifiable risk factor for PTC.

In **ORAL CANCER**, recent evidence now suggests that vitamin D exhibits several different effects on normal and cancerous cells, including up regulation of anti-proliferation and pro apoptotic factors; as well as inhibition of cell cycle promoters and growth factors signaling path ways, such as wnt and mitogen activated protein kinase. Some studies state that vitamin D status for deficiencies and also by tumor – specific up-regulation of the vitamin D catabolism enzyme, cytochrome P450 (CYP<sub>24</sub>) or mutations in vitamin D receptor (VDR) which have been observed in some oral cancers.

In **BLADDER CANCER**, a high serum level of 25 – hydroxy vitamin D was associated with a 25% reduction in relative risk.

**CONSUMPTION OF VITAMIN D FOR PREVENTION OF CANCERS**

Most humans depends on sun exposure to satisfy their requirements for vitamin D solar ultraviolet B photons are absorbed by 7-de hydro cholesterol in skin and transformed to previtamin D<sub>3</sub> which rapidly converts to vitamin D<sub>3</sub>. It is metabolized in the liver to 25-hydroxy vitamin D<sub>3</sub>.

Maintaining blood concentration of 25 – hydroxy vitamin D<sub>3</sub> above 30ng/ml is not only important for maximizing intestinal calcium absorption but also may be important for providing the extrarenal 1 $\alpha$  – hydroxylase that is present in most tissues to produce 1,25 dihydroxy vitamin but avoiding all direct sun exposure increases the risk of vitamin D deficiency.

D<sub>3</sub>. Although chronic excessive exposure to more sunlight, may lead to **NON MELANOMA SKIN CANCER**, Recommend vitamin D to be prescribed for people with cancer, although some evidence suggests hypovitaminosis D may be associated with a worse outcome for

some cancers and that higher 25- hydroxy vitamin D levels at that time of diagnosis are associated with better outcomes.

### LOW VITAMIN D MAY BE AN INDEPENDENT RISK FACTOR FOR DEATH

A robust and rapidly growing body of research clearly shows that vitamin D is critical for good health and disease prevention, in part due to the fact that influences about 10% of all yours genes.

The scientist found that having the genes associated with life long low vitamin D increase the risk of cancer death by more than 40% and the risk of death from any cause by more than 30%. This study shows that there may be a casual relationship between vitamin D levels and death.

### VITAMIN D LEVELS

#### 25 Hydroxy D

Deficient	Optimal	Treat cancer	Excess
<50 ng/ml	50-70 ng/ml	70-100 ng/ml	>100 ng/ml

### PRECAUTIONS

1. Expose your bare skin to the sunlight (Ultraviolet B rays) for 15 minutes is necessary (also 5 minutes is much more enough, but it's based on the nature of the skin type). This can quickly happens, particularly in summer. Don't need to tan or burn your skin, to turn pink and begin to burn.
2. If you can't get enough sunlight, you should take supplement of vitamin D, as directed by physician.
3. Sunscreen lotions block a lot of vitamin D production, so, don't allow the lotion to stand on you from early morning to sunset.
4. Diet includes fatty fish, beef liver, egg yolks, fortified milk and orange juice to provide vitamin D.

### CONCLUSION

Vitamin D deficiency is now becoming a contributing factor in many cancers .The main reason for this is lack of exposure to sunlight by the present generation who usually stay in air conditioning offers and also work for late hours and wakeup late in the morning there by avoiding sunlight in the morning which has rich vitamin D .To prevent cancer, all of us should atleast expose ourselves to sunlight everyday to prevent the attack of cancer.

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