

## Role of vitamin D in the development and prognosis of carcinoma-insight of treatment strategy in Pakistan.

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Vitamin D deficiency (VDD) is the most prevalent, undiagnosed and mal-treated nutritional deficiency worldwide [1]. Pakistan, a South Asian country located near the equator is the victim of VDD which is common in every age and both genders despite being sunbathed the whole year. This is clearly a mystery waiting to be solved. A recent study conducted by Mubashir et al. discovered that about 75.7% of Pakistani population is predominantly VD deficient [2]. The best source of Vitamin D (VD) is sunlight Ultraviolet B rays. It is absorbed by melanocytes present in the epidermal layer of human skin which is then converted into its most active form 1,25 dihydroxycholecalciferol by liver and kidneys respectively. Studies have shown possible reasons for Pakistani population being hypovitaminosed-D is either due to darker pigmentation of skin hindering the synthesis of VD or addictive habit of chewing betel-nuts thus leading to VDD by altering the enzymes regulating circulating 1,25(OH) (2)D concentration [3,4].

VD is a steroid hormone regulating many cellular pathways through its gene induced transcription effects. Many epidemiological studies have shown a positive association with good prognosis of cancer and VD supplementation, although it is not tested on human models but rectifying VDD can decrease metastatic incidences. In its active form, calcitriol supplementation is effectively shown to enhance ALA-PDT chemotherapeutic effect on breast cancer cells in a tumor effective manner with least damage to skin [5]. It is an attractive approach for maximal patient's comfort. VDD amplifies the growth of BCa (Breast Carcinoma) as these cells express VDR (Vitamin D receptor) which regulates gene transcription of ID1 oncogene associated with breast cancer [6]. These studies suggest that the people with low circulating level of VD are at a significantly higher risk of developing cancer and correcting its deficiency can protect mass population.

The discrepancy between health practitioners of Pakistan and recommended treatment of VDD is worth mentioning. Patients are prescribed with high and prolonged doses of VD supplements for joints pain and weakness without knowing their whole history opens a new chapter of health problems. People thoughtlessly following such prescriptions can face toxicity due to increased absorption of Zinc, Calcium and Lead resulting in nausea, vomiting, stomach pain, constipation, bone loss, hypercalciuria, kidney failure, fatigue and dizziness etc. [7].

It is concluded that VDD is a strong predisposing factor of cancer development, which can alarmingly affecting most of the Pakistan's population. More studies should be carried out on human model to confirm the role of VD in tumor suppression.

It will help to significantly reduce the cost of treatments as well as enhance patient's comfort and compliance to chemotherapy. However, blind prescription is not a solution, but a malpractice. It is suggested that circulating calcitriol levels should be tested before the commencement of VD supplementation [8]. Moreover in order to effectively eradicate VDD from society, it is necessary to educate masses about VD prevailing deficiency and its consequences especially in regard to development of Breast Cancer.

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