Vitamin D in combination cancer treatment

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Abstract:

As a steroid hormone that regulates mineral homeostasis and bone metabolism, 1?, 25-dihydroxycholecalciferol (calcitriol) also has broad spectrum anti-tumor activities as supported by numerous epidemiological and experimental studies. Calcitriol potentiates the anti-tumor activities of multiple chemotherapeutics agents including DNA-damaging agents cisplatin, carboplatin and doxorubicin; antimetabolites 5-fluorouracil, cytarabine, hydroxyurea, cytarabine and gemcitabine; and microtubule-disturbing agents paclitaxel and docetaxel. Calcitriol elicits anti-tumor effects mainly through the induction of cancer cell apoptosis, cell cycle arrest, differentiation, angiogenesis and the inhibition of cell invasiveness by a number of mechanisms. Calcitriol enhances the cytotoxic effects of gamma irradiation and certain antioxidants and naturally derived compounds. Inhibition of calcitriol metabolism by 24-hydroxylase promotes growth inhibition effect of calcitriol. Calcitriol has been used in a number of clinical trials and it is important to note that sufficient dose and exposure to calcitriol is critical to achieve anti-tumor effect. Several trials have demonstrated that safe and feasible to administer high doses of calcitriol through intermittent regimen. Further well designed clinical trials should be conducted to better understand the role of calcitriol in cancer therapy.

Key Word:

vitamin D, calcitriol, cancer, chemotherapy