

維他命 D 與免疫學之關係

Vitamin D is critical to the immune system

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Vitamin D, or cholecalciferol, is a fat-soluble vitamin, which is derived from cholesterol and is present in low amount in very few natural food. The major source of vitamin D is from the *de novo* synthesis in keratinocytes of the skin catalyzed by ultraviolet light. In addition to roles in the maintenance of calcium homeostasis in blood and bone metabolism, vitamin D is very important for the immune system. The physiological action of Vitamin D in immune system is through the vitamin D receptor (VDR), a member of the nuclear receptor superfamily, which is expressed in most tissues. In immune system, the activation of VDR can cause anti-inflammatory effects and immunocompetent cell differentiation, inhibition of cell growth, and immune deviation toward Th2 cytokine plethora. The interactions between corticosteroids and Vitamin D are interesting. Both are derived from cholesterol and exert individual action through the intracellular receptors. They share suppressive effects in the respect of immune activation. However, in the other respect, they compete each other in the role of immunosuppression in a limited arena of body's defense against foreign invaders. Vitamin D plays roles in the control of Th1 proinflammatory diseases such as psoriasis, psoriatic arthropathy, inflammatory bowel diseases and rheumatoid arthritis. Dietary supplementation of vitamin D and dermal transformation of biologically inactive vitamin D to active form are thus helpful for the alleviation of these diseases. Hydroxylation of vitamin D at the C1 and C25 in the kidney and liver is critical to the functional integrity of active vitamin D. Thus, in addition to osteopenia the immune system is also compromised in severe hepatic and renal diseases which is by and large relevant to the insufficient synthesis of active vitamin D, the 1,25-dihydroxycholecalciferol.