

Abstract

Curr Med Chem. 2007;14(29):3051-8.

Vitamin D, Pit-1, GH, and PRL: possible roles in breast cancer development.

Perez-Fernandez R, Seoane S, Garcia-Caballero T, Segura C, Macia M.

Department of Physiology, School of Medicine, University of Santiago de Compostela, Rua San Francisco, s/n, 15782 Santiago de Compostela, Spain.

BACKGROUND: 1 α ,25-Dihydroxyvitamin D(3) [1,25-(OH)(2)D(3)], the most active metabolite of vitamin D, exerts its biological effects by binding to a specific intracellular receptor (the vitamin D receptor, VDR) present in target cells. 1,25-(OH)(2)D(3) is involved in a host of cell processes, including calcium homeostasis, cell growth and differentiation, and secretion of hormones.

DISCUSSION: Several studies have explored the role of 1,25-(OH)(2)D(3) in cell growth and differentiation in normal and tumoral mammary gland, in which it shows antiproliferative effects. These effects have been attributed to suppression of growth-stimulatory signals and potentiation of growth-inhibitory signals, leading to changes in cell-cycle regulators as well as to induction of apoptosis. In apparent contrast to these antiproliferative effects, however, several studies have suggested that breast tumor formation may be related to the autocrine/paracrine effects of growth hormone (GH) and prolactin (PRL). The pituitary transcription factor-1 (Pit-1), which in the pituitary is critical to both cell differentiation and PRL and GH transcription, has been recently found in normal and tumoral human breast tissue, with mRNA expression levels significantly higher in tumors than in normal breast. As in the pituitary, Pit-1 regulates mammary GH and PRL secretion, increases cell proliferation and decreases apoptosis. 1,25-(OH)(2)D(3) administration to the MCF-7 human breast adenocarcinoma cell line significantly reduces Pit-1 expression, suggesting that inhibition of Pit-1 expression by 1,25-(OH)(2)D(3) may reduce the increase in proliferation induced by this transcription factor directly or indirectly through increased GH and/or PRL expression.

SUMMARY: In this review, we evaluate the role of 1,25-(OH)(2)D(3) and Pit-1/PRL/GH in human breast, and consider the relationships between these factors in normal mammary development and in breast cancer.

PMID: 18220741