Vitamin D induced dysregulation of nuclear receptors may account for higher prevalence of some autoimmune diseases in women.

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According to the US/CDC, Autoimmune Hashimito's is ten times more likely to occur in women than men, particularly during the childbearing years. Data gathered from a large cohort of patients with a variety of autoimmune diagnoses has confirmed this statistic. The study, in which subjects were administered a VDR nuclear receptor agonist, also shows Hashimoto's is frequently associated with other autoimmune diagnoses. Additionally hypothyroidism is frequently found in the absence of formal Hashimoto's antibodies. Vigano et al. [1] recently showed that the hormone 1,25-dihydroxyvitamin-D and its target, the VDR, are over-expressed in the cycling endometrium. Furthermore, 1,25-D expression in the endometrium reportedly rises by 40% in the pregnant decidua. Marshall [2] has shown that 1,25-D docks into the Thyroid-alpha-1-nuclear-receptor (ThRa) with an Kd of 8.41, meaning that at high concentrations, it can displace ThRa's endogenous ligands (T3, T4). Any resultant hypothyroidism might subsequently contribute to the severity of other autoimmune conditions. During cycling and pregnancy, women produce higher levels of 1,25-D than men, and so are disproportionately affected by the tendency of excess 1,25-D to dysregulate ThRa. The fact that 1,25-D reaches its highest level during pregnancy may explain why women of childbearing age are particularly affected by thyroid-related issues. Further, the study found that 1,25-D's effects on the GCR seem to similarly impair the adrenal axis. More research is needed into the effects of excess 1,25-D on ThRa, GCR and other nuclear receptors.

1. Viganò P, Lattuada D, Mangioni S, Ermellino L, Vignali M, Caporizzo E, et al. Cycling and early pregnant endometrium as a site of regulated expression of the vitamin D system. Journal of molecular endocrinology. 2006 Jun; 36(3): 415-24.

2. Marshall, Trevor G. 2008. "Vitamin D discovery outpaces FDA decision making" BioEssays 30(2):173-182
