Expression of Nuclear Receptor for 1, 25- Dihydroxy Vitamin D3 in Reproductive Organs of Cycling Mice

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Abstract

Introduction: The active form of vitamin D3 (1, 25 (OH)2 vitamin D3) plays a critical role in the male or female reproductive organs. The activity of this hormone is mediated by an intranuclear receptor. The synthesis of this receptor is itself modulated by several hormones including estrogen. In this study, the expression of the nuclear receptor for 1, 25 (OH)2 D3 (Vitamin D receptor, VDR) in reproductive organs of cycling mice has been addressed.

Materials & Methods: The estrous phases of Balb/c mice, including proestrus, metoestrus, estrus and diestrus were determined by cytomorphological study of vaginal smears. The mice were killed at each phase and endometrial samples were collected. Expression of VDR mRNA was assayed by semi-quantitative RT-PCR. Immunohistochemical analysis was used for the evaluation of VDR protein expression in uterus, ovary and fallopian tubes.

Results: VDR-specific transcripts were expressed in the endometrium of all stages of estrus cycle. The relative expression of VDR mRNA at estrus phase was more prominent compared to the other phases ($p<0.001$). Immunohistochemical analysis revealed that almost all endometrial cells, including stromal, luminal and glandular epithelial cells, Theca interna, Theca externa and Cumulus oophorus cells of ovary and fallopian epithelial cells highly express VDR.

Conclusion: In rodents, mating occurs exclusively at estrus phase and having considered the potent immunosuppressive effects of 1, 25 (OH)2 D3, high expression of VDR at estrus phase might be a fundamental mechanism for the induction of active tolerance against paternal allogenic sperm antigens.

Key Words: Vitamin D3 receptor, Endometrium, Uterus, Ovary, Fallopian tube, Estrous cycle, Mice.

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