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THE SIGNIFICANCE OF VITAMIN D IN HISTOPHYSIOLOGICAL PROCESSES AND IMMUNOCYTE SELECTION IN THE THYMUS AND SPLEEN

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Abstract

This abstract examines the role of vitamin D in the histophysiology of the thymus and spleen, thymocyte selection, and the maintenance of the balance between anti-inflammatory and regulatory cytokines at the tissue level. The effect of vitamin D on immunocyte differentiation is summarized.

Keywords: Vitamin D, calcitriol, histophysiology, thymocytes, selection, apoptosis, Treg cells.

Background.

The active metabolite of vitamin D (calcitriol) is an important steroid hormone that regulates immunocyte proliferation, differentiation, and apoptosis. Studying the role of vitamin D in the histophysiological mechanisms of T-lymphocyte selection in the thymus and the development of the peripheral immune response in the spleen is of theoretical relevance.

Aim of the study. To elucidate the role of vitamin D in the histophysiology of the thymus and spleen, T- and B-lymphocyte selection, and the modulation of cytokine balance.

Results and discussion.

1. **Thymocyte selection and apoptosis:** In the cortical and medullary layers of the thymus, vitamin D regulates the apoptosis (elimination) of physiologically incompetent and autoaggressive T-lymphocytes, establishing immune tolerance to the body's own tissues.
2. **Peripheral immunomodulation:** In splenic tissue, vitamin D normalizes the activity of pro-inflammatory effector cells (Th1, Th17). Conversely, it stimulates the release of anti-inflammatory cytokines and regulatory T cells (Tregs), which maintain immune balance.

Conclusion. Vitamin D contributes to maintaining central and peripheral immune tolerance by regulating immunocyte selection and cytokine balance in the histophysiology of the thymus and spleen.