

عنوان مقاله:

Effect of resistance training with and without vitamin D calcium chitosan nanoparticle supplements on apoptosis markers in ovariectomized rats: An experimental study

محل انتشار:

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خلاصه مقاله:

Background: Hormone therapy is one of the most effective treatments for menopausal disorders, but it may increase the risk of breast cancer, coronary heart disease, and pulmonary embolism. Objective: The present study investigated the effect of resistance training with and without vitamin D calcium (Ca⁺⁺) chitosan nanoparticles on apoptosis markers in ovariectomized rats. Materials and Methods: ۴۲ female Wistar rats were divided into ۷ groups (n = ۶/each). One group was assigned as the healthy control to show the induction of menopause. The other ۶ groups comprised ovariectomized (OVX) animals including: ۱) vitamin D + calcium + chitosan + resistance training, ۲) saline + estrogen + resistance training, ۳) saline + resistance training, ۴) vitamin D + calcium + chitosan, ۵) saline + estrogen, and ۶) OVX + control. ۴۸ hr after the last intervention, the hippocampus tissue was extracted to measure the BCL-۲-associated X (BAX), B-cell lymphoma ۲ (BCL-۲), and caspase-۳ gene expression as well as the percentage of dead cells. Results: OVX rats demonstrated increased BAX gene expression, the ratio of BAX gene expression to BCL-۲, caspase-۳ gene expression, and percentage of dead cells of hippocampal tissue, but decreased BCL-۲ gene expression. Resistance training and vitamin D Ca⁺⁺ chitosan nanoparticle supplements seemed to reverse these changes. Conclusion: The combination of resistance training and vitamin D Ca⁺⁺ chitosan nanoparticle supplements may be considered a non-pharmacological treatment for OVX-induced apoptosis.

کلمات کلیدی:

.Apoptosis, BCL-۲-associated X protein, Caspase-۳, Estrogen replacement therapy, Hormone replacement therapy

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