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The Effects of Estradiol Valerate and Remifemin on Norepinephrine Signaling in Ovariectomized Rat Brain.

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Abstract

Aims: We observed the **norepinephrine** pathway changes from the locus coeruleus (LC) to the preoptic area of the hypothalamus (POAH) in the **brain** of **ovariectomized** rats under low estrogen levels and explored the therapeutic **effects** of **estradiol valerate** (E2) and **Remifemin** (ICR) on these changes. **Methods:** 40 female Sprague Dawley rats were randomly divided into surgery with vehicle (SHAM), ovariectomy surgery with vehicle (OVX), ovariectomy with E2 treatment (OVX + E2), and ovariectomy with **Remifemin** (OVX + ICR) group. After 4 weeks' treatment, we observed the changes below by immunohistochemistry. **Results:** 1) The average optical density (AOD) of DBH-ir fibers and the numbers of α -1 adrenoceptor- and ER α -positive neurons in the main nuclei of POAH were all reduced in OVX rats compared with the SHAM group. The above changes were normalized in all nuclei of POAH in the E2 group, while were normalized in some nuclei in ICR group. Co-expression of ER α and α -1 adrenoceptor was observed in POAH. 2) The numbers of DBH- and ER α -positive neurons in LC decreased in OVX group compared with SHAM group, and increased after treatment with E2 and ICR. Co-expression of ER α and DBH was observed in LC. **Conclusion:** Low estrogen (OVX) altered **norepinephrine** synthesis in the LC, the projection of **norepinephrine** fibers and α -1 adrenoceptors expression in POAH. Both E2 and ICR normalized the **norepinephrine** pathway, but E2 achieved greater **effects** than the latter. ICR had different **effects** in different nuclei in the POAH and its therapeutic effect was better in the LC. © 2015 S. Karger AG, Basel.

PMID: 25613345 [PubMed - as supplied by publisher]

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