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


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 adrenoreceptor- and ERα-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 ERα and α-1 adrenoreceptor was observed in POAH. 2) The numbers of DBH- and ERα-positive neurons in LC decreased in OVX group compared with SHAM group, and increased after treatment with E2 and ICR. Co-expression of ERα and DBH was observed in LC. Conclusion: Low estrogen (OVX) altered norepinephrine synthesis in the LC, the projection of norepinephrine fibers and α-1 adrenoreceptors 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.

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