

IMPACT OF CORTEXIN ON MICROBICIDAL ACTIVITY OF NEUTROPHILS IN CONDITIONS OF OVARECTOMY

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More and more attention of researchers is attracted by an issue of impairment in the neuro-immune-endocrine homeostasis and capabilities of its correction in various pathological conditions. It is known that hypoestrogenemia entails a violation of neuropsychiatric status as estrogens have an affect on dopaminergic, serotonergic, noradrenergic and other processes in the central nervous system. Furthermore, we observe the suppression of immunological reactivity during menopause (physiological or post-operative). Finally, an important role of the neuroendocrine regulation in immunogenesis processes is proved. In this respect, we are interested in the possibility of correction of neuro-immune-endocrine disorders by psychotropic drugs with the immunotropic activity.

It is known, that the functional activity of phagocytes, including neutrophils, which react to the slightest changes in an organism, may serve as an integral index of the immune system.

Therefore, we studied an impact of Cortexin, which has a neuroprotective effect, on the microbicidal activity of polymorphonuclear leukocytes (PMNL) in ovariectomized female rats.

In the present study we used 40 white non-inbred adult female rats, weighing 180 - 220 g, kept under standard vivarium conditions. Bilateral ovariectomy was performed under light ether anesthesia. Sham-operated animals got similar surgical access without removing ovaries.

All animals were divided into 4 groups: group 1 - control (intact animals), group 2 – sham-operated (SOVX), group 3 - ovariectomized animals (OVX) and group 4 - ovariectomized animals treated with Cortexin (OVX+Cort) in a dose 1 mg/kg intramuscularly during 10 days, counting the end of the 3-week observation period after the operation as the day zero.

Number of leukocytes in peripheral blood, microbicidal activity of PMNL (against fungi *Candida albicans*) in conditions of functioning and blockade of mechanisms of oxidative killing by sodium azide, as well as myeloperoxidase content and cationic proteins in PMNL were assessed. The results were recorded the day after the last administration of Cortexin (day 11).

The statistical data processing was performed using methods of variation statistics, package Statistica 8.0 software. The critical level of significance p for statistical criterions was set at 0.05. The data are presented in the text as a percentage of control.

On the 32-nd day after surgery we observed decrease in the number of peripheral blood

leukocytes (for 20% relative to the Control and LOVX groups) in ovariectomized animals. The suppression of oxygen-dependent microbicidal mechanisms was shown. It was evidenced by increase in the number of colony forming units of *C. albicans* (up to 139.19%) and decrease in the myeloperoxidase activity of PMNL (almost for 40% relative to intact animals). As a result, inactivation index of PMNL in the OVX group was 79.65%. We also revealed an inhibition of non-oxidative factors of PMNL microbicidal activity: the number of colony-forming units increased up to 136.52% ($p=0.0097$) and the content of cationic proteins declined almost 3 times ($p=0.0304$). Inactivation index was 69.53%.

Application of Cortexin completely eliminated leukopenia induced by ovariectomy. Activity of oxidative mechanisms of PMNL killing was also restored: the number of colony-forming units decreased to 120.27%, inactivation index amounted to 91.52%. This fact was confirmed by increasing of myeloperoxidase activity of PMNL to the norm: percentage of MP-positive cells was 105.13% and average cytochemical coefficient was 98.51% (relative to intact animals). However, Cortexin did not eliminate the suppression of the non-oxidant factors of PMNL as inactivation index was 73.67%. It was also evidenced by continued low level of cationic proteins in PMNL.

In summary, use of Cortexin in ovariectomized animals provided an increase of the number of cells and restoration of activity of oxygen-dependent microbicidal mechanisms in neutrophils to the level of intact animal.