MORPHOGENESIS OF THE AORTA AND PULMONARY TRUNK IN OFFSPRING BORN TO MOTHERS EXPOSED TO CHRONIC STRESS

Samatov, Akmal Khushboqovich

Samatova, Maftuna Gulom qizi

1 Assistant, Department of Human Anatomy and OXTA, Tashkent Medical Academy

2Assistant, Department of Public Health and Healthcare Management, Tashkent Medical Academy

Email: akmal.bek12352@gmail.com

Background

In modern urban environments, noise pollution is a significant acoustic stressor affecting the cardiovascular system. Chronic acoustic stress (CAS) activates the hypothalamic-pituitary-adrenal axis, increasing corticosterone secretion and leading to oxidative stress and endothelial dysfunction.

Objective. To identify morphological and morphometric changes in the aorta and pulmonary trunk of offspring born under stress and to assess the correlation between the obtained results and biochemical changes.

Tasks. To study the specific developmental characteristics of the aorta and pulmonary trunk during various periods of postnatal ontogenesis; to evaluate morphological changes in the aorta and pulmonary trunk of offspring born to mothers exposed to chronic stress; to determine changes in the connective tissue framework of the aorta and pulmonary trunk in offspring born to mothers exposed to chronic stress; and to create an algorithm for the vascular changes observed in offspring born to mothers exposed to chronic stress.

Materials and Methods. Group 1 – Control (Control Group). Rats in this group were not exposed to any stress. They were housed under standard laboratory

conditions with free access to food and water.**Group 2 – Experimental (Stress Group)** .Acoustic stress was induced by noise in pregnant female rats in this group. Intensity: 90–100 dB (decibels), Frequency Range: 3000–5000 Hz (hertz), Duration: 4 hours/day. **Group 3 – Stress + Polydatin Group.** Rats in this group were also subjected to the same noise stress as described above; however, polydatin was administered as an antioxidant protectant against this background. Preparation: Polydatin (0.4 mg/kg). Method of administration: per os, dissolved in water. Regimen: Daily acoustic stress was administered for 4 hours from the first day to the 14th day of pregnancy. Duration: 14 days (during pregnancy).

Results: In this experimental study, 40 pregnant female rats were divided into three groups: a control group, a chronic acoustic stress group, and a stress + polydatin group. The study comprehensively assessed the morphological, biochemical, and molecular effects of acoustic stress on the aorta and truncus pulmonalis. Determination of plasma corticosterone levels showed that under chronic acoustic stress, the level of this hormone in the experimental group was significantly increased compared to the control group. Control group: 85 ± 5 ng/ml. Stress group: 165 ± 8 ng/ml. Stress + polydatin: 110 ± 6 ng/ml. According to the statistical analysis, the difference between the stress group and the control group was significant ($p < 0.01$), confirming the activation of the HPA axis. The decrease in corticosterone levels in the group treated with polydatin indicates the presence of antioxidant and adaptogenic effects.

Conclusion. The results of this study scientifically confirm that chronic acoustic stress induces profound morphological and molecular changes in the aorta and truncus pulmonalis, and demonstrate the protective effect of polydatin against these pathological processes.