2023
February 20-21
Paris, France

38th International Conference on
Psychiatry and Mental Health

Immune and Nervous Systems after Initiation of Experimental Allergic Encephalomyelitis and Activation of Remyelination in Rats

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In experimental research was investigate morphological changers in organs of central nervous system (CNS) – spinal cord, cerebrum and cerebellum and in organs of immune system– thymus and spleen after initiation of experimental allergic encephalomyelitis (EAE) in rats. Process of remyelination was induce after injections of Rebif® (interferon beta-1a) and laser therapy in condition of experimental model (EAE).

Was observe changers of demyelination and remyelination in nerve fibers and reactions in neurons of central nervous system (CNS) on 21 days and 39 days after initiation of EAE. Also, was study reactions in thymus and in spleen on 21 days and 39 days after initiation of EAE.

Histological sections of thymus and spleen was stain hematoxylin – eosin and azure II-eosin. Histological sections of the spinal cord, cerebrum and cerebellum was stain by cresyl violet and toluidine blue (by Nissl). By methods of electron microscopy and morphometry was investigate demyelination and remyelination in nervous fibers.

After initiation of EAE reactive changers in thymus was include – formation of small nodules in cortical part of lobules, decrease amount of lymphocytes in cortex of lobules in early period on 21 days. In late period – 39 days after initiation EAE and influence of Rebif® (interferon beta-1a) and laser therapy by 2 weeks was observe similar changers - increase amount of lymphocytes in cortex.

Reactive changers in spleen after remyelination was include increase amount of lymphoblasts and white pulp in parenchyma.

After influence of Rebif® (interferon beta-1a) by 2 weeks, we observed process of remyelination. We observed the percentage of neurons with unmodified, moderate and severe structural changes, changers of myelinated and unmyelinated nervous fibers. Similar changers was observe after laser therapy, however, in not all cases.

Myelinated nerve fibers was regenerate and the percentage of normal neurons in the brain and spinal cord was increased, the amounts of neurons with severe and destructive changes were reduce in late period of EAE (39 days), after influence of Rebif® (interferon beta-1a) and laser therapy.

Our investigation formed characteristics of demyelination process in EAE condition and reactive changers in the central and peripheral organs of immune system.

Key words: Demyelination, Experimental Allergic Encephalomyelitis, Multiple Sclerosis, Thymus, Spleen.

Biography

Nataliia O. Melnyk is a Professor of the Histology and Embryology Department of National O.O.Bogomolets Medical University, the Leading Research Scientist of the Experimental Modeling Laboratory at the State Institute of Genetic and Regenerative Medicine National Academy of Medical Sciences of Ukraine, Kyiv. Graduated from Kyiv National Taras Shevchenko University in 1993, after an assignment she worked as an engineer in the Institute of Molecular Biology and Genetics. During 2008- 2011, she worked as Deputy Head of the Department of Education and Methodology of the National O.O.Bogomolets Medical University. She has more than 270 scientific and methodological works, 5 patents of scientific research.