

## PREVENTIVE TUFTSIN-PHOSPHORYLCHOLINE ACTION ON THE EXPERIMENTAL AUTOIMMUNE ENCEPHALOMYELITIS IN THE MICE DEVELOPMENT IN MICE C57BL/6



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**Introduction.** Multiple sclerosis (MS) is a severe autoimmune disease characterized by processes of demyelination, axonal injury and neurodegeneration [1].

**Aims.** The aim of our study was to investigate the effects of tuftsin-phosphorylcholine (TPC) [2] on experimental autoimmune encephalomyelitis (EAE) development using one of the best available model of MS in mice.

**Material and methods.** The study was carried out on 23 adult male mice (C57BL/6). Four experimental groups were used: 1 - control (PBS injection); 2 - EAE (MOG 35-55 peptide-induced EAE model); 3 - previous TPC injection before EAE induction (intraperitoneal, 5 mg/kg twice a week), 4 - TPC injection without EAE induction (intraperitoneal, 5 mg/kg twice a week). Neurological deficit was scored as follows: 0-no disease manifestation; 1-limp of a tail; 2 hind limb paralysis; 3 - tetraparesis; 4 - moribund condition; 5 - death. After the experiments, mice were anesthetized. Spinal cord (SC) was fixed in a fresh batch of fixing mixture at +4 for 12 hours and then embedded in paraffin. For histological analysis and immunostaining SC was transversely cut to 5 mcm paraffin sections by sliding microtome (Leica). Parallel sections were staining by Hematoxylin-Eosin (HE) and Luxol Fast Blue (LFB) stain to identify areas of infiltration and demyelination. Activated astrocytes were detected by an avidin-biotin immunoperoxidase method using primary rabbit polyclonal antibody to GFAP (1:500, Abcam). Degree of astrocyte activation was measured by the average number of GFAP-positive astrocytes on the field of view.

**Results.** Injection of TPC significantly reduced a manifestation of EAE in mice. On the 14 day of EAE progress the mean of clinical score was 2.3 in group with EAE and 1.7 in group with TPC injection before EAE induction. Inflammation signs (infiltration by formed elements of blood) and demyelination in EAE were detected by HE and LFB stain at the lumbar level of SC during histological analysis. Perivascular infiltration and demyelination were observed mainly in the lateral part of the white matter adjacent to dorsal horns of gray matter. Demyelination areas were larger in size in EAE group comparing group with preventive TPC injection. On the 14 day of EAE progress the average number of GFAP-positive astrocytes at the lumbar level of spinal cord was 5 + 2 in control animals, 21 + 4 in group with EAE and 7 + 2 in group with preventive TPC injection before EAE induction. Also in EAE group some neurons with signs of granulovascular degeneration were founded in the gray matter at the lumbar level of SC. Also there were neurons with karyorrhexis. In opposite, these alterations didn't observed in group with previous TPC injection.

**Conclusions.** Thus, TPC has the preventive effect to EAE development which was reflected in a decrease in the degree of infiltration and demyelination of the SC. Also decreasing of astrocyte activation indicates TPC-dependent inflammation decreasing.

**Keywords.** Spinal cord, Multiple sclerosis (MS), Tuftsin-phosphorylcholine (TPC), Experimental autoimmune encephalomyelitis (EAE), Neurodegeneration

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## Behavioral assessment of rat offspring after late gestational hypoxia



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**Introduction.** Despite significant progression in the neonatal care, hypoxia remains between the greatest threats to the newborn child even in developed countries [1]. This hypoxic environment experienced in utero determines the growth path of the fetus and might contribute to disease susceptibility later in life [2].

**Aims.** The aim of our study was to assess the effect of late gestational hypoxia on rat offspring with focus on anxiety- and depression-like behavior.

**Methods.** In our study we concentrated on the late gestational hypoxia (19th and 20th day of pregnancy) in rats. We assessed neurobehavioral development of the offspring by a battery of behavioral tests including open field test, elevated plus maze, light/dark exploration, anhedonia test and novelty suppressed feeding.

**Results.** Our results indicate greater susceptibility to maternal hypoxic conditions in males' offspring (higher mortality rate). Weight of male pups from hypoxic group at weaning was significantly decreased. Although we did measure several behavioral variables, no apparent differences were seen in hypoxic group.

**Conclusion.** We suggest that rat brain shortly before delivery is less susceptible to hypoxic conditions preventing significant behavioral changes in later life. However, other organs, e.g. heart, kidney or pancreas might be more vulnerable to late gestational hypoxia projecting as metabolic or cardiovascular diseases [3,4].

**Keywords.** Hypoxia; Offspring; Behavior

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