

Abstract

Title of work: Model of focal brain ischemic lesion in neonatal rats.

Work objectives: The aim of this diploma thesis was to determinate the parameter of the lesion after focal brain ischemia induced by photothrombosis, establish the changes of sensorimotor abilities and investigate the occurrence of post stroke epileptic seizures in this new model in P7 rat pups.

Materials and Methods: Intravenous application of bengal rose dye was followed by illumination of concentrated beam of high powered green laser over the sensorimotocortex for 5 minutes at 0,5s on/off cycles. To assess the motor deficit, rotarod walking test and bar holding test were performed in two months after stroke. The animals underwent implantation of EEG cortical and hippocampal electrodes followed by a week of recovery four months after stroke. EEG monitoring for five consecutive days have been done. Then animals were overdosed with urethane and transcardially perfused. The brains were cut into 50µm slice for histological staining. There were another five previous experiments, which were preliminary studies aiming at correct inducing of photothrombotic stroke and also EEG monitoring at all. Every study included a control groups that underwent the same surgical protocol. Present work includes only the last sixth experiment.

Results: Histological examination of the brain showed significant ischemic brain damage. The lesion size, localization and depth in the brain vary remarkably between animals. There is a statistically significant difference in ratio of the volume of the hemispheres between the control and experimental animals. Experimental animals were less skillful in almost all tests, unable to learn motor skills with repeated exposure in contrast to controls in the statistically mean. Our preliminary results show the occurrence of non-convulsive seizures in experimental animals.

Key words: photothrombosis, neonatal, epilepsy, EEG, seizures