Abstract

Severe perinatal hypoxia represents a substantial brain injury in human newborns. This Diploma thesis is focused on long-term motor outcome of laboratory rat after moderate perinatal hypoxia. We described some behavioral test for detection motor development and presented the influence of perinatal hypoxia on central nervous system. We also discussed an effect of agonists and antagonists of adenosine A_1 receptor in brain. The aim of an experimental part was an evaluation of long-term motor behavior in rats affected by perinatal hypoxia. To cause perinatal hypoxia we put pregnant female rats to a hypoxic (10% O_2) normobaric room in 11^{th} day of their gestation. The pregnant female rats stayed in hypoxic room until they gave a birth and 6 more days after birth with their litters. For classification of motor development we used battery of tests of motor coordination. These tests correspond to the level of development of the rat. Then a group of rats with perinatal hypoxia was treated by a single administration of an agonist of adenosine A_1 receptor 2-chloro-N(6)-cyclopentyladenosin (CCPA) in postnatal day 14. The animals affected by perinatal hypoxia show motor deficits in 3 from 4 selected behavioral tests. Otherwise, this motor behavior was no longer detected in young adults. The rats affected by perinatal hypoxia treated by CCPA had notably better motor behavior than the hypoxic animals without treatment. The results of our experiment demonstrate that perinatal hypoxia affect motor development of the rat. But the reinforcement of adenosinergic inhibition in postnatal period can improve the changes.