

## Abstract

ADHD is a mental disorder with a heterogeneous origin. The number of patients suffering from ADHD is growing. The pathophysiological mechanisms causing ADHD have not been clarified yet. There are few rat models of ADHD - genetic models, chemically induced models (ethanol, nicotine, PCBs, 6-hydroxydopamine lesion) or environmentally induced models (hypoxia).

Methamphetamine is commonly used psychostimulant in the Czech Republic and is often abused by pregnant women. Methamphetamine may cause abnormalities in placenta and umbilical cord that result in hypoxia and malnutrition. Our previous studies showed that prenatal MA exposure leads to memory impairment, changes in NMDA receptors and changes in monoaminergic system

The aim of the present study was to test whether prenatal methamphetamine exposure (5 mg/kg) leads to symptoms of ADHD in comparison with prenatal hypoxia.

We found that adult male offspring prenatally exposed to methamphetamine presented hyperactivity in exploring an unknown environment.

In conclusion, rats exposed to methamphetamine *in utero* have shown changes in different types of behavior in adulthood prenatal hypoxia exposure.

Pregnant Wistar rats were divided into four groups based on their gestational exposure: (1) group was daily administered with subcutaneous injection of MA (5 mg/kg), (2) was injected with saline in the same time and volume, (3) group was affected by daily prenatal hypoxia (10 % O<sub>2</sub>) for one hour, (4) group was control (without any injection). Male rat offspring were tested for their short term memory in Novel object recognition test and Object location test, for their learning and memory in Morris water maze and for their motor activity in Voluntary running test and in Laboras test for their activity in an unknown environment.

We found that prenatal MA exposure lead to increased motor activity in Voluntary running test, OLT and Laboras. Prenatal hypoxia caused increased motor activity in NORT, OLT and Voluntary running test and also caused learning impairment in Morris water maze. Both prenatal exposure models cannot be confirmed as valid animal models of ADHD.