ABSTRACT

Name of the thesis

Reactive oxygen species and their neurophysiological role

Aim of the thesis

Aim of the theoretical part is to provide overview of reactive oxygen species (ROS) and show their place in organism – positive and necessary effects for the organism on the one hand and source of serious diseases on the other hand. Furthermore, the theoretical part deals with the restoration balance between the production of free radicals and antioxidants protection. Theoretical part also deals with substance FeTTPS.

Aim of the experimental part is to determinate whether the application of FeTTPS affects cerebral blood flow during trancallosal stimulation with increasing frequency. Furthermore, to determinate whether the application of this substance affects the slope of the curve and threshold of evoked potentials and number and duration of afterdischargers.

Research method

The research took place at the premises of Onstitue of Physiology, Academy of Sciences, Czech Republic. Experiments were carried out on laboratory albine Wistar rats. General anesthesia was performed to rats, stimulating and sensing electrodes were implanted in epidural area of sensorimotor cortex and Laser Doppler flow probe was implanted into the contralateral hemisphere.

In the first part of experiment included 11 animals. We measured and investigated the influence of trancallosal stimulation on cerebral blood flow before and after application of FeTTPS. We compared the slope of the curve and threshold of evoked potentials and the number and duration of afterdischargers.

Results

Trancallosal stimulation with increasing frequency (3, 5, 10, 15Hz) increases cerebral blood flow. Difference in cerebral blood flow before and after application of FeTTPS is not statistically significant.

Difference of threshold and slope of the curve of evoked potentials before and after application FeTTPS a salin eis not statistically significant.
Duration and number of afterdischarges of experimental group are same before and after application FeTTPS. Duration and number of afterdischarges of control group increase before, 30 and 180 minutes after application FeTTPS.

**Conclusion**

Resulting data show that application FeTTPS reduces duration and number of afterdischarges compared with application of saline.

**Key words**

FeTTPS – evoked potentials – cerebral blood flow – afterdischargers - antioxidants