**EFFECTS OF NEUROTOXIN MPTP AND PARGYLINE PROTECTION ON EXTRACELLULAR ENERGY METABOLITES AND DOPAMINE LEVELS IN STRIATUM IN RATS “FREELY MOVING”**

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**Aim**: The loss of dopaminergic neurons of Substantia Nigra pars compacta in Parkinson’s disease is related to oxidative stress, mitochondrial dysfunction and impaired energy metabolism. The neurotoxin MPTP, known to induce a significant dopaminergic neurodegeneration. The aim of this study was monitoring energy metabolites levels by means of amperometric micro- and bio-sensors. We deemed of interest the study of neuroprotective role of pargyline, on dopamine and energy metabolism. This study was carried out by an microdialysis approach for the simultaneous monitoring of striatal dopamine and energy substrates, in freely moving animals.

**Methods**: Oxygen microsensors, glucose and lactate biosensors, and microdialysis probes were stereotaxically implanted in the right striatum of Wistar rats. Oxygen was electrochemically reduced at -400 mV vs Ag/AgCl reference electrode. Glucose and lactate detection was attained by glucose oxidase or lactate oxidase-based biosensors polarized at +700 mV vs Ag/AgCl reference electrode. MPTP was systemically administrated as follows: 25, 15 and 10 mg/Kg respectively at day 1, 2 and 3. Pargyline (15mg/Kg) was intraperitoneally administered 40 minutes prior MPTP. Striatal levels of catecholamines were quantified by means of HPLC-EC. Glucose, lactate, pyruvate and lactate/pyruvate ratio (L/P) were electrochemically and spectrophotometrically evaluated.

**Results**: The first dose of MPTP increased dopamine levels in striatal dialysate; the second and third doses reduced striatal DA only in animals without pargyline pre-treatment. After neurotoxin administration an increase of all striatal energy substrates was observed. On day 2 and 3, MPTP administration showed a progressive reduction of DA, glucose and pyruvate levels, while an increase in striatal lactate values and L/P ratio were observed. Pargyline pre-treatment reduced dopamine, glucose and pyruvate loss as well as lactate and L/P ratio MPTP-related increase in the rat striatum.

**Conclusion**: These results are suggestive of pargyline neuroprotective effects by preventing MPTP bioactivation and resulting in preserved neuronal dopamine and energy metabolism.