BIO013

Pramipexole and selegiline reduce reactive oxygen species production *in vitro*

Kamila Landucci Bonifácio[1*]; Chiara Cristina Bortolasci[1]; Luciana Higachi[1], Carine Coneglian Farias[1]; Edson Lopes Lavado[2]; Lúcio Baena de Melo[3]; Ramón Kaimen Maciel[3]; Décio Sabbatini Barbosa[4].

[1]Laboratório de Pesquisa e Pós Graduação, [2]Departamento de Fisioterapia, [3]Departamento de Clínica Médica, [4] Departamento de Patologia, Análises Clínicas e Toxicológicas; Centro de Ciências da Saúde, Universidade Estadual de Londrina. [*]kamilalondrina@hotmail.com

Introduction: Parkinson's disease (PD) is characterized by degeneration of dopaminergic neurons in the substantia nigra and motor and non-motor symptoms. Free radicals may play a role in the biochemical events that lead to neuronal death in old age and in neurodegenerative diseases. Furthermore, oxidative stress is apparent in PD. New therapeutic approaches that slow or halt disease progression have been proposed. Antioxidants, free radical scavengers, trophic factors, and monoamine oxidase inhibitors have all been identified as potential agents for the treatment of PD. Analyzing the chemical structure of certain anti-parkinsonian drugs, decided to investigate independent of its anticholinergic or dopaminergic agonism effects. Thus, the aim of this work was to evaluate the in vitro antioxidant potential of Selegiline and Pramipexole. **Methods:** The ethics committee of UEL have approved this study (license number 222/2011).The inhibition of the respiratory burst was performed using an adaptation of the technique described by Huber et al. (2006). Neutrophils were isolated from blood collected with EDTA and the concentration adjusted to 2.5x 10^6 cels/ml. After addition of luminol and stimulus with PMA, the production of reactive oxygen species was quantified by chemiluminescence. Neutrophils buff coat alone as control and with addition of 0.01mg of selegiline or pramipexole were used in the reactions. The results were expressed as the peak values of the kinetic curves and 1st and 3rd quartiles. Statistical analysis was performed using the Kruskal-Wallis test complemented by Dunn's test. Differences were considered significant when $p<0.05$.**Results:** The results have demonstrated the ability of Selegiline and Pramipexole partially inhibit the in vitro respiratory burst. Comparing the results from the addition of Selegiline and Pramipexole to control the Kruskal-Wallis test indicated a statistically significant difference in peak values (c.p.m.) of the kinetic curves in tests ($KW = 40.5$, $p<0.0001$). Dunn's test have shown the peak values obtained with amounts of Selegiline and Pramipexole were different from each respective control. The control of Pramipexole have shown a median of 55075.00 (52233.00 – 55413.00) whereas the Pramipexole was 8584.00 (8496.00 – 9362.00) $p<0.002$. The control of Selegiline was 49536.00 (47127.00 – 50170.00) and Selegiline was 38077.00 (35322.00 – 40452.00) $p<0.002$. There was also a significant difference in peak values on the kinetic curves between Pramipexole and Selegiline $p<0.002$. **Discussion:** Pramipexole and Selegiline have demonstrated to have antioxidant effect in vitro and may have a neuroprotective potential because the active molecule of these drugs can cross the blood brain barrier and exert antioxidant effects in the brain. This antioxidant effect of pramipexole may be due to the hydroxyl groups that are present in the chemical structure of the molecule of this drug. According Schapira (2002) the hydroxylated benzyl ring structure could act by reducing the generation of free radicals and protecting cells from damage caused by oxidative stress favoring neuronal survival in PD patients. Selegiline, probably, acts as an iron chelator and inhibits the Fenton's reaction.

Keywords: Parkinson's disease, Oxidative stress, Antioxidant, Respitarory Burst, Selegiline, Pramipexole.

Financial support: CAPES