INSIGHTS OF [^{18}F]FDG AND [^{18}F]-DOPA TO ASSESS STRIATAL FIBER STATUS THROUGH PET/MR IN LIVING RODENTS UNDER NEUROPROTECTIVE TREATMENT

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Objectives: Animal models of Parkinson's disease are intended to better understand the evolution and treatment of such human disease. A unilateral lesion of nigrostriatal dopaminergic fibers can be induced by a stereotaxic injection of 6-OHDA or bilateral dopaminergic damage can be induced by intraperitoneal injections of a saline solution containing 20 mg/kg of MPTP.

This study aims to assess whether [^{18}F]FDG and [^{18}F]-DOPA are a way to *in vivo* characterize this lesion through Positron Emission Tomography and detect therapy effects.

Methods: Ten male Wistar rats and twelve male C57Bl/6J mice were enrolled. Over 4 weeks, half of the rats was fed with a diet supplemented with 0.2% fenofibrate. Mice were divided in 4 groups: saline-vehicle, saline-Deferiprone_300mg/kg, MPTP-vehicle group and MPTP-Deferiprone_300 mg/kg and treated with such iron chelator by oral gavage twice a day over 4 days, then a 3-day-wash-out.

All rodents underwent 7T T2-weighted MRI 24h prior to PET imaging which included a static acquisition at 45 minutes after a 37 MBq [^{18}F]FDG injection for rats (at t=21) and mice (at t=8) and a 55-min dynamic scan after 15 MBq [^{18}F]-DOPA injection at t=7 for mice.

PET data analysis, after MR co-registration, included manual drawing of ROIs to semi-quantify regional cerebral metabolism and [^{18}F]-DOPA distribution.

Results: FDG-PET imaging showed no differences in rat cerebral metabolism in right and left striatum. Comparison between groups showed no drug effect with regards to fenofibrate.

Interestingly,in mice with MPTP-indiced lesions, deferiprone seems to affect both FDG and FDOPA distribution when compared to naive mice.