REINNERVATION MECHANISMS IN PARKINSON'S DISEASE: ROLE OF APOLIPOPROTEIN E?

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Introduction: A growing set of evidence indicates that Parkinson’s disease (PD) and Alzheimer’s disease (AD) share overlapping neurodegenerative pathways. This is supported for instance by the fact that PD and AD co-occur in a substantial proportion of patients, and that dementia appears in more than 20% of PD patients. A common mediator would be the apolipoprotein E (apoE). ApoE is recognized as the major genetic risk factor for AD which also affects the age of onset of PD.

Aims: To investigate the role of apoE and its accessory proteins in the reinnervation mechanisms in a mouse model of PD's pathology.

Methods: We used the subchronic MPTP model with saline injection as control. A time-course study was performed comprising brain mRNA levels assessment of GFAP, apoE, LDLR and LRP1 at 1 day, 2 weeks, 6 weeks, 4 months post-last injection.

Results: Striatal dopamine was reduced by 90% at day 1 and subsequently returned slowly towards control levels. Striatal mRNAs levels of GFAP, apoE, LDLR and LRP1 were increased at day 1 and returned to control levels shortly after for GFAP, whereas they returned gradually to near control levels for apoE, LDLR and LRP1. MRNAs levels also increased in the hippocampus, more so than in the striatum.

Conclusion: ApoE and its main receptors are markedly activated in response to MPTP-mediated deafferentation in the adult mice brain. However, the relatively modest increase of apoE mRNA in the striatum and the unexpected activation of the same pathway in the hippocampus certainly deserve further analyses.