NEUROCHEMICAL CHARACTERIZATION OF BRAIN STRUCTURES RELATED TO DEPRESSION IN THE BILATERAL 6-HYDROXYDOPAMINE RAT MODEL FOR PARKINSON’S DISEASE

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Introduction: Approximately 45% of patients suffering from Parkinson's disease (PD) are affected by depressive disorders. However, the pathophysiology of PD-associated depression remains largely unknown.

Aim: In the present study, we determined the monoamine content of the hippocampus (HIP) and the prefrontal cortex (PFC), structures related to depression, and of the striatum in the bilateral 6-hydroxydopamine (6-OHDA) rat model.

Methods: Rats were lesioned bilaterally in the substantia nigra pars compacta or the striatum. One or two weeks after the lesion, the levels of dopamine (DA), noradrenaline (NAD) and serotonin (5-HT) were determined by LC in homogenates of the various brain regions.

Results: Striatal DA levels decreased in striatally and nigrally lesioned rats by respectively 50% and 90% compared to control rats. The DA levels in the HIP and PFC showed a trend to reduce in both protocols one week after the lesion and restored to baseline levels two weeks post-lesioning. There was no significant effect of the two lesion protocols on 5-HT levels in all regions studied. However these lesions resulted in significantly decreased hippocampal NAD levels to 50% compared to controls. In the PFC, this decrease was less pronounced.

Conclusion: Nigrostriatal degeneration alters hippocampal NAD content but has no effect on 5-HT levels. No clear effects on DA levels were observed in the HIP and PFC in both lesion protocols. Striatal and nigral lesions resulted in similar effects on monoamine content in depression-related brain structures. These findings could contribute to a better understanding of depression in PD.