Striatal dopamine transporter

The dopamine transporter (DAT) is a transmembrane protein that is responsible for the reuptake of dopamine (DA) from the synaptic cleft and for the termination of dopaminergic transmission.

Pak et al. investigated the predictive value of dopamine transporter (DAT) availability in the striatum of healthy subjects using 123I-FP-CIT single-photon emission computed tomography (SPECT). In total, 84 participants with available data on their weight for the 60 months after SPECT were included. Specific binding of 123I-FP-CIT to DAT was calculated using region-of-interest analysis, and the putamen-to-caudate nucleus ratio (PCR) was determined. After comparing the weights at 12, 24, 36, 48, and 60 months after SPECT with the baseline weight, they categorized participants into three groups: weight gain (> 5%), stable (-5%-5%), and weight loss (< -5%). PCRs of the weight-loss, stable, and weight-gain groups significantly differed at 36 and 48 months. According to post-hoc analysis, PCRs were lower in the weight gain group at 36 and 48 months compared with at the remaining time points. Overall, the results suggest that PCRs calculated based on DAT availability could be used to predict future weight changes. It is possible that the interactions between the caudate nucleus and the putamen, rather than the individual behavior of each structure, might play an important role in weight regulation. Further studies are needed to investigate the time-dependence of the predictive value of DAT [1) 2)].

Degeneration of dopaminergic neurons in the substantia nigra projecting to the striatum is responsible for the motor symptoms in Parkinson's disease (PD). Deep brain stimulation (DBS) of the subthalamic nucleus (STN) is a well-established procedure to alleviate these symptoms in advanced PD. Yet the mechanism of action, especially the effects of STN-DBS on the availability of striatal dopamine transporter (DAT) as a marker of nigrostriatal nerve cell function, remains largely unknown [3)]

1)
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2)
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3)
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