

The Use of DaTscan in Idiopathic REM Sleep Behavior Disorder (iRBD) as a Screening Tool to Identify Patients at Risk for Developing Parkinsonism Syndromes (PS)

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Introduction

DaTscan (Ioflupane I 123 Injection) is a radiopharmaceutical indicated for striatal dopamine transporter visualization using single photon emission computer tomography (SPECT) brain imaging to assist in the evaluation of adult patients with suspected Parkinsonism syndromes (PS). Studies have demonstrated that the motor symptoms of PS become apparent when about 80% of basal ganglion dopamine neurons are lost. Studies have reported that a large percent of patients with idiopathic REM Sleep Behavior Disorder (iRBD) develop PS many years after first presenting with RBD. Some studies suggest PS develops in as many as 75% of iRBD patients. Therefore at the time of diagnosis in iRBD patients, the degree of dopamine neuronal loss is unknown. Qualitative interpretation of DaTscans divides abnormal imaging results into three categories (table 1).

Hypothesis

DaTscan imaging iRBD patients will reveal patterns of dopaminergic neuron degradation similar to what is seen in PS, but possibly to a less extensive degree. This may provide an opportunity to identify which RBD patients are at risk for developing PS.

Table 1: Types of Abnormal DaT Scan Results

- (1) asymmetric putaminal dopaminergic activity
- (2) absent putaminal dopaminergic activity in both hemispheres with activity confined to the caudate nuclei
- (3) absent putaminal dopaminergic activity bilaterally with greatly reduced activity in one or both caudate nuclei

Methods

- Patients treated for iRBD at CSMA have been referred for DaTscans.
- Only patients without a prior diagnosis of PS have been included in this analysis.
- All patients with abnormal DaTscans are referred to a movement disorders clinic for formal evaluation and staging of PS symptoms.

Results

- To date, 8 patients with iRBD, who were not diagnosed with PS at the time of imaging have undergone DaTscans
- 6 of 8 DaTscans produced positive findings for dopaminergic neuron degradation, all with tyoe 1 pattern (Table 1)
- 2 patients have been found to have very mild, early stages of PS symptoms
- 3 patients are still pending DaTscan imaging

Discussion

- Majority (75%) of patients with iRBD had DaTscan findings similar to patterns found in PS
- All positive results showed the mildest (1) pattern of neuronal degradation, which suggests that iRBD may represent a pre-clinical PS

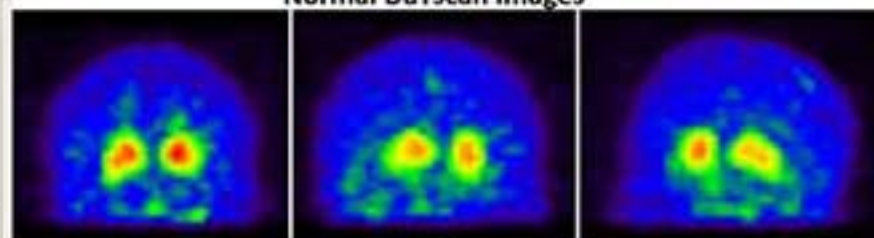
Limitations

- Current DaTscan result reporting does not include quantitative data (i.e. percent of neuronal loss), which would be of interest given the mild positive results found in all patients studied in this protocol
- Initial screening for PS symptoms in iRBD patients performed by investigators

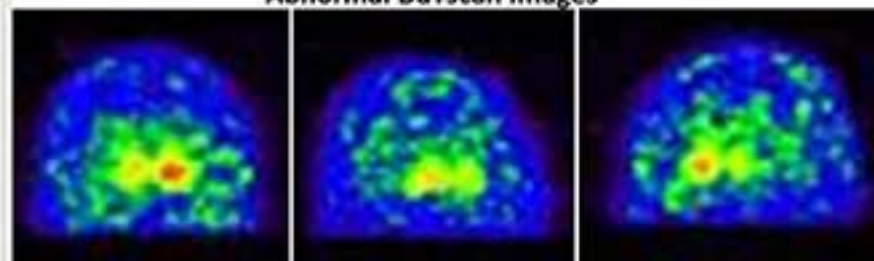
Future Directions

- DaTscan imaging may be a useful tool in identifying which iRBD patients are at risk for developing PS
- Patients with positive DaTscan results may represent a population eligible for future studies that target therapies to slow or reverse the development of PS

Normal DaTscan Images



Abnormal DaTscan Images



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