Clinical relationship among anxiety, rapid eye movement sleep behavior disorder, and abnormal 123I-MIBG-sciptigraphy in Parkinson’s disease

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ABSTRACT

Background (Fig. 1.2): Rapid eye movement sleep behavior disorder (RBD) and anxiety are considered to be non-motor symptoms of Parkinson’s disease (PD). However, it is not clearly understood whether RBD is associated with anxiety in PD patients, and whether cardiac 123I-MIBG-sciptigraphy, considered to be a biomarker of cardiovascular disease, could also be a biomarker for anxiety.

Objective (Fig. 3): To investigate whether RBD is associated with anxiety in PD patients, and evaluate the usefulness of MIBG-sciptigraphy as a biomarker for anxiety.

Methods (Fig. 3): Seventy-nine PD patients (45 males), including 47 patients with polysomnography-proven RBD (28 males) and 32 patients without RBD (17 males), were evaluated by the Japanese version of the State Trait Anxiety Inventory (STAI) for anxiety and performance MIBG-sciptigraphy.

Results (Table 1): In all PD patients, the prevalence of anxiety based upon STAI-state and STAI-trait was high (57% vs. 52%). However, there was no significant difference between PD patients with or without RBD in the prevalence (57% vs. 56%, odds ratio, 1.05; 95% CI, 0.4–2.6) and in the severity (42.4±10.0 vs. 41.4±9.3, P=0.64) of anxiety. Although the delayed heart-to-median (H/M) ratio of MIBG-sciptigraphy was significantly reduced in PD patients with RBD compared with those without RBD (1.46±0.21 vs. 1.91±0.70, P=0.0001), the presence of anxiety in each group was not related to the reduction of H/M ratio (1.42±0.20 vs. 1.52±0.20, P=0.11; 1.82±0.76 vs. 2.01±0.62, P=0.45, respectively).

Conclusion: In our study, the presence of RBD and anxiety are related to each other, although the prevalence of high anxiety in PD patients. MIBG-sciptigraphy is not correlated with the presence of anxiety, different from RBD.

The cardiac 123I-MIBG-sciptigraphy is known to be reduced in PD patients and used to make a diagnosis of PD. Recently, PD patient with RBD shows markedly more uptake reduction on both sides than those without RBD, suggesting a severe reduction of 123I-MIBG-sciptigraphy uptake could be a biomarker for the presence of RBD in PD patients. However, it is not clearly understood whether RBD is associated with anxiety in PD patients and whether cardiac 123I-MIBG-sciptigraphy could be a biomarker for anxiety. In this study, we retrospectively assessed the clinical data of PD patients with or without RBD, and investigated the clinical relationship among anxiety, RBD, and abnormal 123I-MIBG-sciptigraphy in patients with PD.

Fig. 1

Time courses of the onset of the non-motor features of Parkinson’s disease

Prodomal Stage (2-5 years)
- Hypomnia
- Sleep disturbance (e.g. RBD)
- Depression
- Constipation

Early motor stage (3-6 years)
- Fatigue
- Pain
- Diplopia

Early-middle stage (4-12 years)
- Anxiety
- Hypomnia
- Dysphagia
- Sleep disturbance (e.g. fragmentation)

Late stage (4-12 years)
- Dementia
- Cerebral dysfunction
- Hallucination
- Incontinence

Fig. 2

Is there relationship among anxiety, RBD, and abnormal MIBG in PD patients?

Fig. 3

Selection

PD patients agreed to our cohort study between
Admission: 2012 May – 2015 June
Included in this study (n=79)

Table 1: Relationships between RBD and the clinical variables

<table>
<thead>
<tr>
<th>A. Demographic variables</th>
<th>B. Non-Motor symptoms</th>
<th>C. Imaging findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, %male</td>
<td>Age at onset of PD, yr</td>
<td>Disease duration of PD, yr</td>
</tr>
<tr>
<td>59.6 ± 53.1</td>
<td>61.4 ± 10.6</td>
<td>6.6 ± 4.3</td>
</tr>
</tbody>
</table>

Table 2: Relationships between anxiety and the clinical variables

<table>
<thead>
<tr>
<th>A. Demographic variables</th>
<th>With anxiety (n=45)</th>
<th>Without anxiety (n=34)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, %male</td>
<td>Age at onset of PD, yr</td>
<td>Disease duration of PD, yr</td>
</tr>
<tr>
<td>57.8 ± 59.9</td>
<td>63.7 ± 8.9</td>
<td>67.1 ± 12.8</td>
</tr>
</tbody>
</table>

PD: Parkinson’s disease; RBD: rapid eye movement sleep behavior disorder; MIBG: metaiodobenzylguanidine; STAI: State Trait Anxiety Inventory; UPDRS: Unified Parkinson’s Disease Rating scale; MMSE: Mini Mental State Examination; CBF: cerebral blood flow; NCNP: National Center for Neurology and Psychiatry; N=156; \* Inclusion criteria: PD diagnosis (Part IV; non-referred); ** Exclusion criteria: MRI proven RBD (%); ¶ In paralysis agitans (who is referred as PD); ¥ in off=6 (Parkinson’s disease, non-referred); \# in the middle of 2 years (who is referred as PD); \( \) in the middle of 2 years (who is referred as PD).

Abbreviations
- ABSTRACT
- Assessment
- Anxiety
- Depression
- Disease duration
- Disease onset
- Gender
- Gait
- Hypomnia
- MIBG: metaiodobenzylguanidine
- MIBG scintigraphy
- MMSE: Mini Mental State Examination
- Movement disorder
- Non-motor symptoms
- Off
- On
- UPDRS: Unified Parkinson’s Disease Rating scale

References
- 4. The authors declare that there are no conflicts of interest.