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ASSOCIATION BETWEEN ABNORMAL CIRCADIAN RHYTHM OF MELATONIN SECRETION AND NOCTURNAL POLYURIA IN PATIENTS WITH PARKINSON'S DISEASE.

Hypothesis / aims of study

Patients with Parkinson's disease (PD) have not only motor impairment but also lower urinary tract dysfunction (LUTD) as a one of non-motor impairment. Nocturia (= nocturnal frequency) is a common LUTD in patients with PD, and which not only impairs quality of life but also disturbs sleep and results in falling and fracture. Nocturia is reported to be a risk factor of cognitive dysfunction, mental dysfunction and increased mortality. In general, decrease in bladder volume and nocturnal polyuria are considered to be common causes of nocturia. However, nocturia caused by nocturnal polyuria is a little known in neurological disease except some neurological diseases such as cerebrovascular disease, multiple sclerosis, multiple system atrophy, Alzheimer disease and spinal cord injury. The mechanism of nocturnal polyuria in these neurological disease is also little known except decreased ADH secretion during sleeping at night.

We previously reported that not only decreased bladder capacity but also nocturnal polyuria may have a greater role in the causes of nocturia in patients with PD, and the pathophysiology of nocturnal polyuria in PD may be associated with abnormal circadian rhythm of AVP. However, the other pathophysiology of nocturnal polyuria in PD has not been known.

Recently, the association between melatonin secretion and nocturia in elderly individuals is reported. And it is also reported that melatonin agonist may improve nocturia.

Then, We evaluate the association between circadian rhythm of melatonin secretion and nocturnal polyuria, and try to estimate the another pathophysiology of nocturnal polyuria in PD.

Study design, materials and methods

Eighteen patients with PD with motor fluctuations were recruited; those with other conditions that might have influenced lower urinary tract function were excluded. All studied subjects were evaluated using a lower urinary tract symptom questionnaire and bladder diary (voiding frequency diary), and blood serum of them were collected every 4 hours for 24 hours to evaluate the circadian rhythm of melatonin secretion.

Results

Fourteen patients with PD (77.8%) had nocturnal polyuria. Ten patients with PD (55.6%) had decreased amplitude/night-to-daytime ratio of melatonin secretion, eight (44.4%) had a phase advance of the nocturnal melatonin secretion, and seventeen (44.4%) had decreased duration/disruption of melatonin secretion. All patients with PD and without nocturnal polyuria had almost normal melatonin secretion, but all patients with PD and nocturnal polyuria had one and more of abnormal melatonin secretion which described above.

Interpretation of results

Most of patients with PD and motor fluctuation had nocturnal polyuria. And all patients with PD and nocturnal polyuria had one and more of the pattern of abnormal circadian rhythm of melatonin secretion.

Concluding message

In patients with PD, nocturnal polyuria and abnormal circadian rhythm of melatonin secretion were coexisted with high probability. Thus, the pathophysiology of nocturnal polyuria in patients with PD may be associated with abnormal circadian rhythm of melatonin secretion.

Disclosures

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