Sleep disorders among patients with Parkinson’s disease

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ABSTRACT

Parkinson’s disease is a progressive neurodegenerative disorder causing motor and non motor symptoms with sleep disorders among most common disabling non motor symptoms. As Parkinson’s disease progresses and symptoms get worse, sleep problems may become more serious. Sleep disorder sometimes begins even before motor symptoms are diagnosed in Parkinson’s. The objectives of the study were to assess sleep related disorders and associate sleep disorders with selected demographic variables among patients with Parkinson’s disease. The present study used quantitative research approach with descriptive design. 70 sample attending Parkinson’s clinic of Amrita Institute of Medical Sciences, were selected using Non probability convenience sampling. Demographic variables were collected using semi-structured questionnaire and sleep disorders using standard tool- Parkinson’s disease sleep scale. Data analysis was done using descriptive and inferential statistics like frequency, percentage, and chi square test. The mean Hoehn and Yahr stage was 3.29 (SD 1.385). The findings of the study revealed that 51.4% (36 out of 70) subjects had sleep problems. There was no statistically significant association between PDSS score and demographic variables at 0.05 level of significance. There was a significant association between PDSS score and clinical variables including fatigue, depression, Hoen and Yahr stage and dopamine agonist at .05 level of significance. The result of the study showed that sleep disorders are common in Parkinson’s patients. This suggests that health care professionals should screen the patients with Parkinson’s disease for sleep problems especially focusing on fatigue, depression, dopamine intake and stage of disease.

Keywords: Neuro degenerative disorder, Parkinsons disease, sleep disorder

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INTRODUCTION

Parkinson's disease is a disorder of the central nervous system that causes a loss of cells in the part of the brain that controls movement. The Center for Disease control rated complications from Parkinson’s disease as the 14th leading cause of death in the United States. Worldwide, it is estimated that four to six million people suffer from the condition. In India incidence of PD is 1% among adults aged 65 years or older and 5% among aged more than 80 years. India has about 7 million people living with PD. The PD is more common among men by a ratio 3:2. People with Parkinson’s disease experience a range of symptoms, including tremor (shaking), rigidity (stiffness), slowness of movement, and problems with balance and coordination. They may also have memory problems, depression, and sleep complaints. Sleep problems may be an early sign of Parkinson’s disease, even before motor symptoms have begun. Some of the common sleep problems for Parkinson’s patients include: Insomnia, Excessive daytime sleepiness, Nightmares, Sleep attacks (a sudden involuntary episode of sleep), REM sleep behavior disorder (acting out dreams during sleep), Periodic leg movement disorder (PLMD), Restless legs syndrome (RLS), Sleep apnea, Nocturia (frequent night time urination) These sleep-related symptoms can have a major impact on quality of life for Parkinson’s patients and treatment for these problems should be integrated with their therapeutic regimens. As Parkinson’s disease progresses and symptoms get worse, sleep problems may become more serious.

MATERIALS AND METHODOLOGY

A quantitative non-experimental descriptive design chosen for the study. 70 patients who attended Parkinson’s clinic of Amrita Institute of Medical Sciences, Kochi were selected using non probability convenience sampling. The participants had to meet the inclusion
criteria which included patients with Parkinson’s disease who are registered in Parkinson’s clinic and those who are able to read and write English or Malayalam. Those who are in stage one according to Hoen and Yahr scale and patients with Parkinson’s disease who are not willing to participate in the study were excluded. Disease specific PDSS was used to evaluate sleep problems in Parkinson’s Disease. Parkinson’s Disease Sleep Scale (PDSS) a standardized tool developed by Ray Chaudhuri, Claudia Trenkwalder which consist of 15 items on a 5-point Likert-type scale ranging from 0: “Very often” to 4: “Never”, except for item 1 which is reversed. Range of the domain scores: 0-20. Range of the total score: 0-60. Domains include 5 items each on Parkinson’s disease symptoms at night, motor symptoms at night, and disturbed sleep. The subjects were selected using convenience sampling technique and a rapport was established with them. After the researcher explained the purpose of the study, a written informed consent was obtained from the subjects and the questionnaire which included the demographic and clinical variables were collected by interview method and followed by self-administered questionnaire on Parkinson’s Disease Sleep Scale (PDSS).

**FINDINGS**

**Section A: Distribution of subjects according to their demographic variables.**

The data showed 34 (48.6%) subjects were male and 36 (58.45%) subjects were females. Regarding the educational status 30 (42.9%) subjects studied up to higher secondary school. With regards to marital status most of the subjects 63 (90%) were married. Regarding the current status of employment category 54 (77%) were unemployed and 43 (61%) subjects had monthly income above Rs/-15000.
Figure 1: Pie diagram showing distribution of subjects based on age

The data presented in fig.1 reveals that 29 (41.4%) subjects belong to the age group 61-70 years, 22 (31.4%) of the subjects belong to the age group 51-60 years, 13 (18.6%) belong to greater than 70 years of age and 6 (8.6%) subjects belong to less than 50 years of age.

Section B: Distribution of subjects according to their clinical variables.

Clinical variable analysis showed 32 (45.7%) of subjects diagnosed to have Parkinson's disease for the last 1-5 years and majority of the subjects 36 (51.4%) had hypertension and most of the subjects 46 (65.7%) had no dyslipidemia. Majority of the subjects 66 (94.3%) were on treatment with carbidopa-levodopa.
Figure 3: Bar diagram showing clinical manifestations of Parkinson’s disease.

The data presented in the fig.3 shows majority of the subjects 51(72.9%) had walking difficulties followed by tremor among 51 (72.9%) subjects, rigidity among 44(62.9%) subjects, memory problems among 21 (38%) subjects, slow movement among 46 (65.7%) subjects rigidity among 44 (62.9%) subjects. Only 2 (2.9%) subjects had urinary urgency.

Section C: Sleep related disorders in Parkinson’s disease

Fig 3 shows distribution of mean scores of PDSS and its domains
Fig 3 shows  The mean PDSS score obtained was 21.114 with a standard deviation of 11.845. The domains of PDSS scored 4.74,6.31,9.47 for motor symptoms at night, Parkinson’s disease symptoms at night, disturbed sleep respectively.

Section D:Association between the Parkinson’s disease sleep scale score and clinical variables of patients with Parkinson’s disease.

Table 3: association between Clinical variables with PDSS mean score

<table>
<thead>
<tr>
<th>Clinical variable</th>
<th>category</th>
<th>mild</th>
<th>moderate</th>
<th>Severe</th>
<th>df</th>
<th>x</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue</td>
<td>yes</td>
<td>9(25.7%)</td>
<td>23(65.7%)</td>
<td>3(8.6%)10</td>
<td>10</td>
<td>16.68</td>
<td>.037*</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>38(97.4%)</td>
<td>0</td>
<td>1(2.6%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>yes</td>
<td>10(31.3%)</td>
<td>20(62.5%)</td>
<td>2(6.3%)</td>
<td>2</td>
<td>6.203</td>
<td>.038*</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>23(68.5%)</td>
<td>13(34.2)</td>
<td>2(5.3%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dopamineagonist</td>
<td>yes</td>
<td>9(26.5%)</td>
<td>23(67.6%)</td>
<td>2(5.9%)</td>
<td>2</td>
<td>12.28</td>
<td>.001*</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>24(66.7%)</td>
<td>10(27.8%)</td>
<td>2(5.6%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoen and yahr stage</td>
<td>0</td>
<td>2(66.7%)</td>
<td>1(33.3%)</td>
<td>0</td>
<td>12</td>
<td>20.16</td>
<td>.018*</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>3(60%)</td>
<td>2(40%)</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5</td>
<td>7(77.8%)</td>
<td>2(22.2%)</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9(50%)</td>
<td>9(50%)</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>11(42.3%)</td>
<td>14(53.8%)</td>
<td>1(3.8%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>1(20%)</td>
<td>4(80%)</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>0</td>
<td>1(25%)</td>
<td>3(75%)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

S:significant

Table 5 represents the association between PDSS score with selected Clinical variables among patients with Parkinson’s disease. It is computed by chi square. The data shows PDSS score is associated with fatigue with $X^2=12.904, p<.05$, indicating that PDSS is higher among patients with Parkinson’s disease having fatigue. Also PDSS is associated with depression with $X^2=6.203, p<.05$, indicating that PDSS is higher among patients with Parkinson’s disease having depression. The data also reveals that PDSS is associated with medication dopamine agonist with $X^2=12.2, p<.05$, indicating that PDSS is higher among patients with Parkinson’s disease who are on medication dopamine agonist. Also PDSS is associated with HoenandYahr stage of Parkinson’s disease.
DISCUSSION

The first objective of the study was to assess sleep related disorders among patients with Parkinson’s disease. In the present study 51.4% (36 out of 70) subjects had sleep problems. The study findings are supported by Tandberg who evaluated the prevalence of and risk factors for sleep disturbances in an unselected group of 245 patients with PD and two control groups of similar age and sex distribution. Nearly two thirds of the patients with PD reported sleep disorders, significantly more than among patients with diabetes (46%) and healthy control subjects (33%). Symptoms of depression and duration of levodopa treatment showed a significant correlation with sleep disorders in the PD group.¹

The study findings revealed that PDSS score is associated with fatigue which is similar to the findings of study conducted by Seevenson .E et al on sleep problems in Parkinson’s disease which was a community based study conducted among 176 consecutive Parkinson’s patients in Norway. The mean age was 68.5 years (range 35–90); the mean Hoehn and Yahr stage was 2.11 (SD 0.86), and the mean UPDRS part III was 22.3 (SD 11.7). Sleep problems were common among PD patients.. There was significant association between fatigue, mental health problems, and RLS were with PDSS score.²

The second objective of the study was to Associate sleep disorders with selected demographic variables among patients with Parkinson’s disease

In the present study PDSS score is associated with depression, fatigue, dopamine agonist treatment and hoen and yahr stage of Parkinson’s disease which is similar to community-based survey conducted by Tandberg as discussed above and also can be compared with study conducted by Ondo, W G, Vuong, MA, H. Khan, Atassi F, Kwak C, Jankovic, J on
Daytime sleepiness and other sleep disorders in Parkinson’s disease. Findings revealed that daytime sleepiness is common in PD and correlates with more advanced and longer duration of PD, and male sex. The Dopamine agonist were also independently associated with daytime sleepiness.³

CONCLUSION

The current findings call for increased awareness of sleep problems in PD patients, especially focusing on the association with depression, fatigue, medication effects and advanced stage of disease.

REFERENCES

