



THE PARKINSONS DISEASE SLEEP SCALE: EVALUATION OF SLEEP DISTURBANCES IN PARKINSONS DISEASE PATIENTS

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ABSTRACT **INTRODUCTION:** The pathology of parkinsons disease extends far beyond the nigrostriatal dopamine pathway and results in non motor symptoms in addition to the commonly accepted motor symptoms. The most common being autonomic dysfunction, mood disorders, and sleep problems. Sleep disturbances occur in 96% of patients with parkinson's disease and appear to arise from a combination of neurochemical and neurodegenerative process involving central sleep regulatory centres such as forebrain, thalamus and midbrain dopamine neurons. We evaluated sleep symptoms in parkinson's disease patients which are one of the predominant non motor manifestations impairing quality living.
METHODS : We enrolled 103 patients with Parkinsons disease in our study and were given PDSS questionnaire addressing 15 items includes overall quality of night's sleep, sleep onset, nocturnal restlessness, nocturnal psychosis, nocturia, nocturnal motor symptoms, sleep refreshment, daytime sleepiness.
RESULTS: PDSS were impaired in advanced stages more than early stages.
CONCLUSION: Sleep disturbance in parkinsons disease especially daytime sleepiness is associated with vehicle accidents and impairs the quality of life. PDSS can be used as screening tool to subject patients to sleep studies and aiming at treating them.

KEYWORDS : Parkinson disease sleep scale, quality of sleep

INTRODUCTION

A large majority (96%) of patients with Parkinsons disease (PD) suffer from various sleep-related problems. Sleep disturbances can be assessed by validated scales like the Parkinson's disease sleep scale (PDSS). Serotonin, acetylcholine and noradrenalin play a role in maintaining wakefulness and the disturbances lead to excessive daytime sleepiness. Loss of orexinergic neurons in the posterior portion of the lateral hypothalamus and the reduction of the A10 dopaminergic group in the ventral tegmental area have also been implicated in impaired wakefulness in Parkinson's disease. The PDSS is a visual analogue scale addressing 15 commonly reported symptoms associated with sleep disturbance. (fig1)

Scales widely employed in clinical practice—including the Epworth sleepiness scale (ESS) and the Pittsburgh sleep quality index (PSQI)—do not systematically address and quantify the different aspects of sleep disturbance in Parkinson's disease. The unified Parkinson's disease rating scale (UPDRS) contains only one question related to sleep problems, and the newly validated Parkinson's disease quality of life scale (PDQ39) is also limited in terms of questions related to sleep.

The sleep disturbances in Parkinson's disease could be related motor symptoms like nocturnal akinesia, tremor; treatment related due to levodopa, dopamine agonists; psychiatric disturbances like hallucinations, vivid dreams; sleep disturbances including insomnia, rapid eye movement behavioral disorder (REM-BD), restless legs syndrome (RLS), periodic leg movements (PLMS) and excessive daytime sleepiness (EDS). (fig2)

AIMS AND OBJECTIVES

To assess various aspects of sleep problems and quality of sleep in parkinsons disease patients

METHODOLOGY

In all, 103 patients with parkinsons disease presenting to neurology outpatient department in Government Rajaji hospital from January to June 2018 were subjected to parkinson's disease sleep scale (PDSS) 2 covering the entire spectrum of disease from newly diagnosed to advanced stages. The study was based on cross sectional descriptive design. All Parkinsons disease patients attending neurology OPD were included. Both males and females were included. Entire spectrum of parkinsons disease from newly diagnosed to treated patients in the advanced stages. Parkinsonian plus diseases like multiple system atrophy, progressive supranuclear palsy or lewybody dementia were excluded. Subjects with cognitive impairment were excluded from the study. Patients suffering from stroke, epilepsy, medical comorbidities, hearing impairment were excluded from the study. Patients consent was obtained before subjecting the patient to study.

Patients were given questions to collect demographic data and Parkinsons disease sleep scale 2. Structured interview method was adopted as sample include both literates and illiterates. Score was interpreted as mild <20, moderate 21-40, severe >41.

RESULTS

Sleep disturbances were present in 88% of patients either due to sleep quality, motor symptoms, or PD symptoms. The study participants were 62 male (60.1%) and 41 females (39.8%). Females belong to the

Please rate the severity of the following based on your experiences during the past week (7 days). Please make a cross in the answer box.

	Very often (This occurs 6 to 7 days a week)	Often (This occurs 4 to 5 days a week)	Sometimes (This occurs 2 to 3 days a week)	Occasionally (This occurs 1 day a week)	Never
1) Overall, did you sleep well during the last week?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2) Did you have difficulty falling asleep each night?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3) Did you have difficulty staying asleep?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4) Did you have restlessness of legs or arms at night causing disruption of sleep?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5) Were you sleep disturbed due to an urge to move your legs or arms?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6) Did you suffer from distressing dreams at night?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7) Did you suffer from distressing hallucinations at night (seeing or hearing things that you are told do not exist)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8) Did you get up at night to pass urine?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9) Did you feel uncomfortable at night because you were unable to turn around in bed or move due to immobility?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10) Did you feel pain in your arms or legs which woke you up from sleep at night?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11) Did you have muscle cramps in your arms or legs which woke you up whilst sleeping at night?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12) Did you wake early in the morning with painful twitching of arms and legs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13) On waking, did you experience tremor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14) Did you feel tired and sleepy after waking in the morning?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15) Did you wake up at night due to smoking or difficulties with breathing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 1: There are 15 items and each given a score between 0 and 4.

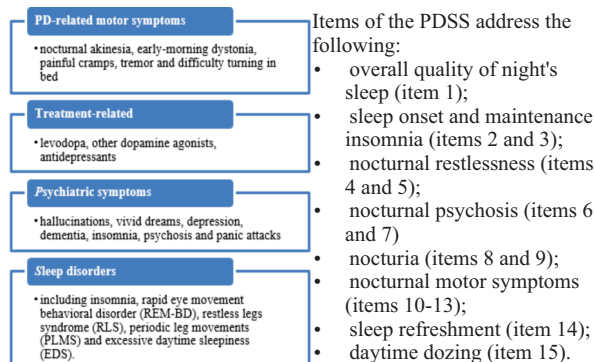


Figure 2: Etiology of sleep disturbance in parkinson's disease

age group between 55-80 years (mean of 65 years) and males between 46-67 years(mean of 54 years).There were 8 patients between 41-50years,50 patients between 51-60yrs,39 patients between 61-70 years ,6 patients between 71-80years and none above 80 years(fig 3).The duration of illness ranges from 6 months to 15 years with mean duration of 1.7 years. About 53% (n=55) of patients had disease duration between 1-5 years.89% (n=92) had stage 3 or less. Disturbed nocturnal sleep was reported in 73.7 %(n=76)patients.34 had difficulty falling asleep and 61 had difficulty in maintaining sleep. Daytime sleepiness was reported in only 11 patients.

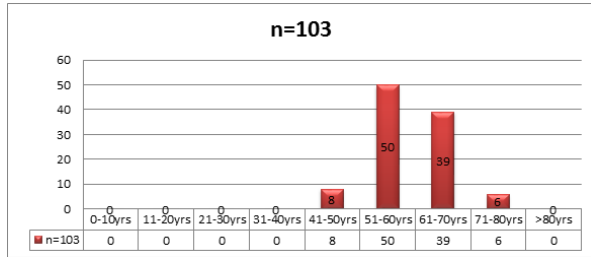


Figure 3: Age distribution of Parkinsons disease patients

Nocturnal quality of sleep were disturbed in 76 patients.34 had sleep onset and 61 had sleep maintenance difficulty.4 had unpleasant sensation in legs and 3 had leg cramps.11 patients had fidgeting and 2 had frightening dreams ,4 had hallucinations.36 had nocturia,3 had urinary incontinence. Excessive daytime sleepiness were present in 11 patients and 11 had unrefreshing sleep (fig 4). The present study findings revealed that 21.1 % (19) mild sleep disturbances, 70 %(63) have moderate sleep disturbances and 8.8 %(8) have severe sleep disturbances. The mean total Parkinson's disease sleep scale score was 27.07.

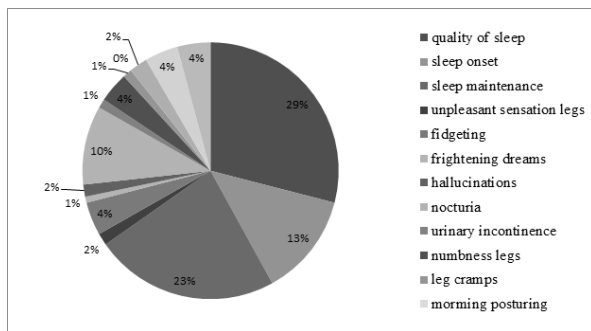


Figure 4: Sleep disturbances in Parkinsons disease.

DISCUSSION

This study shows that the PDSS is easy to use and is a reliable instrument for measuring sleep disturbances in Parkinsons disease. The patients with advanced Parkinsons disease also had significantly impaired PDSS scores compared with patients with early/moderate disease. Sleep assessments in Parkinsons disease involves subjective questioning and objective measurement of sleep architecture. They provide a holistic assessment of the night time problems of sufferers from Parkinsons disease. The PDSS helps in screening patients with sleep problems so that they can be subjected to objective testing by polysomnography. Currently available tools, including the ESS, address single items such as excessive daytime sleepiness and are thus not comprehensive.

The PDSS allows sensitive differentiation of the specific factors contributing to sleep disruption in Parkinsons disease, emphasizing its potential value in targeting the most appropriate treatment for nocturnal symptoms in this condition. Specific symptoms can be identified by combining items such as 4 and 5 for nocturnal restlessness, 10 to 13 for nocturnal off periods, and 14 and 15 for daytime sleepiness, and thus help target the treatment.

CONCLUSION

Predominance of moderate severity of sleep disturbances among our study population could be explained by majority of patients being in the early stage of PD. Limitation of the study being its only an qualitative assessment and patients should be subjected to polysomnography to address specific sleep disturbances and quality of

sleep. However the aim of this study was to search for hidden sleep disturbances which tend to get missed in the OPD and PDSS scale allows quick assessment of the same and needful treatment.

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