

Assessment of Nocturnal and Daytime Sleep disturbances among Elderly Parkinsonism Patients in Baghdad City

تقييم اضطرابات النوم الليلي والنهاري عند مرضى الرعاش المسنين في مدينة بغداد

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الخلاصة:

خلفية البحث: تعتبر اضطرابات النوم واحدة من المضاعفات غير المرتبطة بالحركة الأكثر شيوعاً لمرض الباركنسون والتي تزداد تدريجياً بتطور سير المرض. ما يقارب 98% من مرضى الرعاش قد يشتكون في بعض الأحيان من أعراض ليلية والتي قد تعمل على اضطراب نومهم. أسباب اضطرابات النوم لدى مرضى الرعاش كثيرة وكثير من المرضى لديهم عوامل عديدة لذلك. وهذه الاضطرابات ممكن أن تصنف بشكل واسع إلى ما له علاقة بالنوم المسائي ومظاهر النوم أثناء النهار مثل النعاس والنوم الزائد أثناء النهار.

الهدف: تهدف الدراسة الحالية لتقييم مستويات اضطرابات النوم الليلي والنهاري التي يتصف به كبار السن المصابين بمرض الرعاش في مدينة بغداد، وإيجاد العلاقة بين تلك المستويات وبعض المتغيرات الديموغرافية لكبار السن.

المنهجية: دراسة وصفية أجريت بين التاسع من أيلول، 2013 والخامس عشر من كانون الأول، 2013. تم جمع عينة البحث بطريقة المقابلة غير الاحتمالية لـ 100 من كبار السن المصابين بمرض الرعاش من الذين يحضرون العيادات الخارجية لمستشفيات مدينة بغداد التخصصية للأعصاب ومنها مستشفى الجملة العصبية التعليمي، مستشفى التخصصات العصبية، مقارنة مع مجموعة ضابطة تتكون من 75 من كبار السن الذين لم يصيبوا بمرض الرعاش والذين اختيروا بشكل عشوائي من معارف وأقرباء الباحث. لتحقيق أهداف الدراسة فقد بنيت استبانة خاصة لهذا الغرض وتضمنت جزأين: المعلومات الديموغرافية والجزء الآخر يتضمن من 15 فقرة لقياس مستويات اضطراب النوم (مقياس PDSS). تم تحليل البيانات باستعمال الإحصاء الوصفي: التكرارات والنسبة المئوية، والإحصاء التحليلي: الارتباط، اختبار T -test.

النتائج: أشارت النتائج بأن جميع المرضى المصابين بمرض الرعاش لديهم اضطرابات النوم بمستويات متباينة: 13.0% بمستوى خفيف؛ 32.0% بمستوى متوسط؛ و55.0% بمستوى شديد. وبنت الدراسة بوجود علاقة بين مستوى اضطراب النوم مع عمر المسن ومدة الإصابة بالمرض الرعاش. أيضاً كشفت نتائج الدراسة بوجود اختلافات كبيرة بين مجموعة مرض الرعاش والمجموعة الضابطة ما يخص مستويات اضطرابات النوم المرتبط بمرض الرعاش.

الاستنتاج: أشارت نتائج الدراسة إلى أن غالبية المصابين بالمرض الرعاش يعانون من مستويات عالية من اضطرابات النوم. ووجدت الدراسة بأن هنالك علاقة مهمة بين شدة اضطرابات النوم من جهة وبين عمر المصاب ومدة الإصابة بهذا المرض. وتوصلت الدراسة بأن هنالك اختلافات كبيرة بين مجموعة المصابين بالمرض الرعاشي ومجموعة الضبط.

التوصيات: توصي الدراسة بتأسيس مراكز تخصصية التي تعطي العناية الخاصة لهؤلاء المرضى، متابعة كل مريض من مرضى الباركنسون المسجلين في هذه المراكز، وأخيراً الدعم المالي من قبل الحكومة وتخصيص رواتب لهم لتمشية أمور حياتهم.

Abstract

Background: Sleep disturbances are one of the most common of the non-motor complications of Parkinson's disease (PD), and increase in frequency with advancing disease. As many as 98% of patients with PD may suffer at some time from nocturnal symptoms, that can disturb their sleep. The causes of sleep disturbance in PD are numerous, and many patients may have several factors that contribute. These disorders can be broadly categorized into those that involve nocturnal sleep and daytime manifestations such as excessive daytime sleepiness.

Objectives: To assess the levels of disturbances of nocturnal and daytime sleep of the Parkinson's disease patients in the city of Baghdad and to find out relationship between these levels and some demographic characteristics of patients.

Methods: A descriptive study was conducted between the ninth of September, 2013 and 15th of December 2013. A purposive non-probability sample of 100 elderly patients who are diagnosed with Parkinson's disease and another 75 aged matched healthy controls were recruited to participate in the study. To reach the objectives of this study a questionnaire was constructed. The present questionnaire consists of two parts; demographic characteristics; gender, age, and duration of illness; and 15 items as a part of Parkinson's disease Sleep Scale (PDSS) for measuring levels of sleep disturbances.

Results: The results indicate that all the patients with Parkinson's disease have different levels of sleep disturbances: 55.0% with severe level, 32.0% with moderate level, and only 13.0% with mild level.. There is a significant association between levels of sleep disturbances and age and duration of illness. Also the results revealed that there were a wide difference between the Parkinson's disease group and matched healthy control group regarding the sub-categories of sleep disturbances.

Conclusions: The results of the study indicated that more than half of PD patients had severe level of sleep disturbance; there were significant relationships between severity of sleep disturbances and age and duration of disease; and finally there was a difference between PD participants and matched controls group.

Recommendations: Establishing specialized centres which give daily cares for patients with Parkinson's disease, follow-up programmes for each patient registered at these centres, and governmental financial support for those patients.

Keywords: Sleep, disorder, Parkinson's, inflicted, individuals, Baghdad.

INTRODUCTION

Parkinson's disease (PD) is a chronic, long-lasting, progressive, disabling neurodegenerative disease that influences up to 2% of the general population over 65 years, does not significantly shorten life expectancy, involves both motor and non-motor symptoms⁽¹⁾. It has a high incidence of co-morbidity, and for which only symptomatic treatment is currently available⁽¹⁾. Early in the course of the disease, the most obvious symptoms are movement-related symptoms, including tremor which are the uncontrolled and rhythmic movements of the hands, arms, legs and even jaw; slowness of movement and difficulty with walking and gait^(2,3). Other symptoms including sleep and emotional problems, depression, difficulties in coordination and speech, severe fatigue, problems with balance and pain will have an impact on the patient's quality of life^(3,4). The majority of individuals with Parkinson's disease find it hard to sleep through the night hours. Rigid muscles, tremors or stiffness at night, or not being able to roll over in bed can all hinder sleep, as can the numerous urge to urinate. In addition, many individuals with Parkinson's disease experience dramatic dreams or hallucinations and act out their dreams, violent nightmares⁽⁵⁾. Sleep has been categorized into two alternating stages; first, rapid eye movement (REM) sleep and non-rapid eye movement sleep (NREM). These stages are described by brain wave activities, muscle activities, and eye movements. As individuals begin to fall asleep they enter into the lightest of the four stages of NREM sleep, stage one. While sleep maintains, individuals descend into the deeper situation of sleep down through stages two and three. Subsequently, individuals move back up through these stages and enter a REM phase. When individuals are waked during REM sleep, they often report having been dreaming⁽⁶⁾.

Various Studies have revealed that high percentage (60% to 98%) of the patients inflicted with Parkinson's disease suffer from sleep disturbances^(6,7,8). These disturbances are multi-factorial and related to the underlying continuous deterioration process of this disorder⁽⁹⁾. Some sleep disorders, in particular REM sleep behaviour disorder (RBD) and excessive daytime sleepiness (EDS) may arise as a primary manifestation of Parkinson's disease⁽¹⁰⁾, reflecting the anatomic areas affected by the neurodegenerative process. Daytime problems such as excessive daytime sleepiness, frequent night-time awakening and sleep disruption are the most common sleep problems in Parkinson's disease⁽¹¹⁾. Sleep disturbance takes the form of sleep disintegration with frequent and long-lasting awakenings and daytime sleepiness; nocturnal sleep disturbance is difficulty in turning over in bed, painful leg cramps, vivid dreams/ nightmares, back pain, limb/ facial dystonia and leg jerks are the main causes of nocturnal awakening in Parkinson's disease patients. Sleep disturbance progressively worsens with disease sequence, signifying that it is related to the severity of the disease⁽¹²⁾. Sleep disturbances may be generally considered as part of the normal aging process, being more familiar in the elderly⁽¹³⁾. Sleep disorders, such as: excessive daytime sleepiness, result in severe consequences like car accidents or impairment of social functioning, and thus a major decline of the Parkinson's Disease patients' quality of life⁽¹⁴⁾.

OBJECTIVES

The present study aims to assess the levels of sleep disturbances among the elderly patients in the city of Baghdad and find out the association between these levels and some

demographic characteristics of elderly patients; and to find out any differences between the Parkinson's group and the control group.

METHODOLOGY

A descriptive study was conducted between the ninth of September, 2013 and 15th of December 2013. A purposive non-probability sample of 100 aged individuals who are diagnosed with Parkinson's disease and another 75 aged matched healthy controls were recruited to participate in the study. For those who are diagnosed by PD, participants were chosen from two Neurological hospitals in the city of Baghdad: the outpatient department of the Neurological Teaching Hospital and outpatients department of the Neurological Sciences Hospital. And for the aged matched controls, were recruited from the relatives and the acquaintances of the researcher. To meet the objectives of this study a questionnaire was constructed. This questionnaire consists of two parts; demographic characteristics; gender, age, and duration of illness; and 15 items as a part of Parkinson's disease Sleep Scale (PDSS)⁽¹⁵⁾ for measuring levels of sleep disturbances. These 15 items deal with the following manifestations; item one: overall quality of night's sleep; items two and three: sleep onset and maintenance insomnia; items four and five: nocturnal restlessness; items six and seven: nocturnal psychosis; items eight and nine: nocturia; items ten to thirteen: nocturnal motor symptoms; item fourteen: sleep refreshment; item fifteen: daytime dozing. These items were measured, scored and rated of 5-level Likert rating scale "4" indicates that the status was (extremely exist) as (always), "3" indicates (exist) of the status as (mostly), "2" indicates (occasionally exist) of the status as (sometimes), and "1" indicates (rarely exist) of the status as (rarely), and "0" indicates (absence) of the status as (never). The rating scale was implicated to rate the frequency and extension of the status. For all, 175 aged participants who completed the Parkinson's disease Sleep Scale (PDSS), 100 participants with Parkinson's disease and 75 aged participants who were matched as healthy controls. The 100 participants diagnosed with Parkinson's disease completed the PDSS while attending outpatient department at the two neurological hospitals. There were 72 men (72%) and 28 women (28%). Their age mean was 62.5 years (range 41 to 83), and the mean duration of their disease was 7.5 years (range 3 to 15). For the 75 aged healthy matched controls who completed the PDSS were mainly hospital employees and their relatives who were with no medical conditions. There were 52 men (69.3%) and 23 women (30.7%). Their mean age was 61.6 years (range 39 to 86). The data analysis was achieved by applying the descriptive analysis (distribution, frequency and percentage) which was used to demonstrate the demographic characteristics of the individuals participated; and to explain the distribution of levels of the sleep problems according to their demographic characteristics. Unpaired *T*-test was applied to find out the significant differences between PD group and matched controls group; Pearson correlation was also used to discover the relationship the demographic characteristics and severity of sleep disturbances.

RESULTS

Table 1 Demographic characteristics of control group and PD group

		Participants			
		Matched Controls		With PD	
		f	%	f	%
Gender	Male	52	69.3%	72	72.0%
	Female	23	30.7%	28	28.0%
	Total	75	100.0%	100	100.0%
Age	≤ 49	14	18.7%	11	11.0%
	50-59	27	36.0%	24	24.0%
	≥60	34	45.3%	65	65.0%
	Total	75	100.0%	100	100.0%
Duration of Disease	≤ 4			29	29.0%
	5-9			38	38.0%
	≥ 10			33	33.0%
	Total			100	100.0%

Table 1 indicates that a high percentage of the participants of both groups are males; about half of control group are 60 years old and more and the majority of PD group are more than 60 years old; and 38.0% of PD group are within duration of disease from 5 to 9 years.

Table 2 distribution in the levels of severity of sleep disturbances according to the two groups

Groups	Severity of Sleep Disturbances									
	Not Disturbed		Mildly-disturbed		Moderately-disturbed		Severely-disturbed		Total	
Group	f	%	f	%	f	%	f	%	f	%
Control group	54	72.0%	15	20.0%	4	5.3%	2	2.7%	75	100.0%
PD group	0	0.0%	13	13.0%	32	32.0%	55	55.0%	100	100.0%

Table 2 shows that among control group participants 72.0% of those have no sleep disturbances; and 55.0% of PD group have severe level of sleep disturbance.

Table 3 Distribution in the levels of severity of sleep disturbances according to the demographic characteristics of the PD group; and correlation between the levels and demographic characteristics

Demographic Characteristics		Severity of Sleep Disturbances								Correlation Coefficient
		Mildly-disturbed		Moderately-disturbed		Severely-disturbed		Total		
		f	%	f	%	f	%	f	%	
Gender	Male	9	9.0%	26	26.0%	37	37.0%	72	72.0%	0.046
	Female	4	4.0%	6	6.0%	18	18.0%	28	28.0%	
	Total	13	13.0%	32	32.0%	55	55.0%	100	100.0%	
Age	≤ 49	1	1.0%	4	4.0%	6	6.0%	11	11.0%	0.004
	50-59	3	3.0%	7	7.0%	14	14.0%	24	24.0%	
	≥ 60	9	9.0%	21	21.0%	35	35.0%	65	65.0%	
	Total	13	13.0%	32	32.0%	55	55.0%	100	100.0%	
Duration	≤ 4	3	3.0%	11	11.0%	15	15.0%	29	29.0%	0.002
	5-9	5	5.0%	10	10.0%	23	23.0%	38	38.0%	
	≥ 10	5	5.0%	11	11.0%	17	17.0%	33	33.0%	
	Total	13	13.0%	32	32.0%	55	55.0%	100	100.0%	

Table 3 reveals that men, age group ≥60, and duration of disease 5-9 are more likely to have severe level of sleep disturbance in the PD group than other demographic characteristics sub-domains.

For the effect of whether the participant is male, older, and has less or more duration of illness the study indicates that there is a significant relationship between age, and duration with the levels of severity of sleep disturbances.

Table 4 Differences between control group and PD group regarding the main domains of levels of severity of sleep disturbances

		Group					Confidence interval CI 95%	p-value
		Controls		PD				
Items	Sleep Disturbance Domains	Mean	SD	Mean	SD	Mean Difference		
1	Overall quality of night's sleep	0.56	0.12	1.82	0.62	1.26	0.41-0.85	p<0.002
2,3	Sleep onset and maintenance insomnia	1.25	0.73	3.44	1.31	2.19	0.82-1.37	p<0.001
4,5	Nocturnal restlessness	1.17	0.71	3.21	1.43	2.04	0.86-1.18	p<0.002
6,7	Nocturnal psychosis	1.19	0.69	3.16	1.67	1.97	0.79-1.18	p<0.001
8,9	Nocturia	1.89	0.84	3.81	1.54	1.92	0.91-1.01	p<0.002
10-13	Nocturnal motor symptoms	2.95	1.24	7.27	2.56	4.32	1.76-2.56	p<0.003
14	Sleep refreshment	0.64	0.13	1.93	0.81	1.29	0.49-0.80	p<0.001
15	Daytime dozing	0.42	0.11	1.85	0.72	1.43	0.34-.109	p<0.002
Overall sleep Disturbance		24.51	5.6	28.22	3.3	3.71	1.13-2.58	p<0.001

Table 4 shows that there are high differences between the two groups ($p \leq 0.001$), and there is difference between the control group and PD group regarding each of eight sleep disturbances domains as shown above.

DISCUSSION

1. Discussion of demographic characteristics

Regarding the gender of participants table (1) shows that for control group 69.3% of the participants are males and 30.7% are females; and for PD group 72.0% are males and 28.0% are female. Some studies agree with this result such as Frazier and Marsh (2006)⁽¹⁶⁾ who found in their study that 64% of participants were male; and 66.4% in Politis's and his colleagues study (2010)⁽¹⁷⁾.

For the age of the participants, the study reveals that about half of PD participants are 60 years old and more. This result is supported by a number of studies such as Wertheimer and his colleagues (2007)⁽¹⁸⁾; Lyons and Pahwa (2011)⁽¹⁹⁾; and Shulman (2010)⁽²⁰⁾.

Regarding the duration of PD the study indicates that about three quarters of participants have been inflicted by this disorder for five years and more, this result is supported by Chaudhuri and his colleagues (2006)⁽²¹⁾.

2. Discussion of the severity levels of sleep disturbance in PD group

According to the results of table (2) all PD participants have different levels of sleep disturbances; 13.0% mildly-disturbed, 32.0% moderately-disturbed, and 55.0% severely-disturbed. This result is supported by many studies^(22,23) such as Wegelin and his colleagues who found that 59% of the patients with Parkinson's disease had moderate to severe sleep disturbances distributed in to day and night types⁽²⁴⁾.

3. Discussion of the differences between the PD group and matched controls group

The study reveals that there is high difference between the both groups regarding the sleep disturbances whether within its domains or as a total scale score ($p < 0.001$). This result is supported by Brodsky and his colleagues⁽²³⁾ who revealed in their study that elderly patients had more sleep disturbance levels than elderly people without Parkinson's disease.

CONCLUSIONS

The study concluded that most of participants with Parkinson's disease were males; about half of them were 60 years old and more; a high percentage of participants with PD have had this disease for five to nine years. The study revealed also that the majority of PD patients had severe level of sleep disturbance; there was a significant relationship between severity of sleep disturbance and age and duration of disease; and finally there was a difference between PD participants and control group.

RECOMMENDATIONS:

According to the results the study recommends:

1. Establishing special centres which give daily cares for patients with Parkinson's disease.
2. Follow-up programmes for each patient registered at these centres.

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