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بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

Fatigue in Parkinson's Disease: is it Primary or Secondary?

Thesis

Submitted For Partial Fulfillment of Master Degree in Neuropsychiatry

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بسم الله الرحمن الرحيم

قالوا

سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم

صدق الله العظيم

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Mahmoud Aly Hassan Hegazy

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List of Abbreviations

Abbr.		Full-term
Ach	**:**	Acetylcholine
αSyn	**:**	Alpha-synuclein
BDI		Beck depression inventory
ChT	**:**	Choline transporter
COMT	**:**	Catechol-O-methyl-transferase
DA	**:**	Dopaminergic
DATs	**:**	Dopamine transporters
DAWS	**:**	Dopamine agonist withdrawal syndrome
DIP	**:**	Drug-induced Parkinsonism
DLB	**:**	Dementia with LBs
DWI	**:**	Diffusion weighted imaging
EDS	**:**	Excessive daytime somnolence
EDS	**:**	Excessive daytime sleepiness
FACIT-F	**:**	Functional Assessment of Chronic Illness Therapy—Fatigue Scale
FSS	**:**	Fatigue Severity Scale
GABA	**:**	Gamma amino butyric acid
GDS-15	**:**	Geriatric depression scale
HS	**:**	Highly significant
ICD	**:**	Impulse control disorder
IQR	**:**	Interquartile range
JP	**:**	Juvenile Parkinsonism
LBs	**:**	Lewy bodies
L-dopa	**:**	Levodopa
LRRK2	**:**	Leucine-rich repeat kinase 2
MADRS	**:**	Montgomery-Asberg depression rating scale
MAO-B	**:**	Monoamine Oxidase B
MFI	**:**	Multidimensional Fatigue Inventory
MIBG	**:**	Metaiodobenzyl guanidine
MRI	**:**	Magnetic Resonance Imaging
MS	**:**	Multiple sclerosis

MSA	**:**	Multiple system atrophy
NHP	**:**	Nottingham Health Profile
NMDAR	**:**	N-methyl-D-aspartate receptor
NMS	**:**	Nonmotor symptoms
NPH	**:**	Normal-pressure Hydrocephalus
NS	**:**	Non significant
OH	**:**	Orthostatic hypotension
OR	**:**	Odds ratio
PD	**:**	Parkinson's disease
PET	**:**	Positron emission tomography
PFS-16	**:**	Parkinson Fatigue Scale
PSP	**:**	Progressive supranuclear palsy
RBD	**:**	Rapid behavior sleep disorder
REM	**:**	Rapid eye movement
REM	**:**	Rapid eye movement
RLS	**:**	Restless leg syndrome
RNA	**:**	Ribonucleic acid
S	**:**	Significant
SD	**:**	Standard deviation
SNCA	**:**	Synuclein gene
SNpc	**:**	Substantianigra pars compacta
SPECT	**:**	Single-photon-emission computed tomography
SPSS 22	**:**	Statistical package for Social Science
SWI	**:**	Susceptibility-weighted imaging
TCS	**:**	Transcranial B-mode sonography
TIP	**:**	Toxin-induced Parkinsonism
UCDA	**:**	Ursodeoxy cholic acid
UPDRS		Unified parkinson's disease rating scale
VP	**:**	Vascular Parkinsonism
123I-IBZM	**:**	123I-iodobenzamide
123I-β-CIT	**:**	123I-iometopane
99mTc-HMPAO	**:**	Technetium 99-hexamethylpropyleneamineoxime

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Abstract

Background: Fatigue is generally defined as a sense of exhaustion for a defined period that is unexplained by drug effects, medical, or psychiatric disorders. In Parkinson's disease (PD), fatigue is considered one of the most common and disabling non motor symptoms, which may manifest even during premotor stages of disease, and once present may often persist or even worsen over time. **Aim of the study:** is to study fatigue whether it's primary or secondary in idiopathic Parkinson's disease (PD) patients. **Methods:** A case control study was conducted on 50 patients with Parkinson's disease attending involuntary movements outpatient clinic at Ain Shams University Hospitals and Ain Shams University Specialized Hospital and 50 control subjects of relatives or accompanying person of the patients. UPDRS scale, PD NMS questionnaire, Parkinson's disease fatigue scale, Pittsburg sleep quality index, RBDS questionnaire, Restless legs syndrome scale, Beck depression scale and Parkinson's anxiety scale were done for all cases. **Results:** This study showed significant correlation between fatigue scale result and scores of levodopa equivalent dose, UPDRS III, IV and sleep quality while there was no significant correlation between fatigue and other parameters including depression, anxiety, restless leg, sleep quality and REM sleep behavioral disorder. **Conclusion:** Fatigue is a major problem for approximately half the PD population and tends to develop early. There are few data regarding the relationship of fatigue to gender, age of onset of fatigue, onset of motor symptoms of PD, or its correlation with other medical or behavioral co morbidities aside from depression.

Keywords: Parkinson disease; PD; fatigue; Neurology; Psychology.

Introduction

Parkinson's disease (PD) is a common movement disorder characterized by bradykinesia, rigidity, and resting tremors ***(Kalia and Lang, 2015).***

PD symptoms are divided into two parts: motor symptoms and non-motor symptoms ***(Schapira et al., 2017).***

Non-motor symptoms vary from one patient to another, and there are several different non-motor symptoms in PD, such as autonomic symptoms and fatigue. Fatigue is a common disabling symptom but easily ignored in PD ***(Fernandes et al., 2021).***

Half of all PD patients were influenced by fatigue ***(Kluger, 2017).***

Fatigue is divided into physical fatigue and mental fatigue. Fatigue could be the first symptom in PD patients ***(Rodriguez et al., 2020).***

Generally, it can be defined as an overwhelming sense of tiredness, weakness, lack of energy, and exhaustion or as a mismatch between expended effort and actual performance; or as a reduction in the capacity to either initiate or sustain voluntary activities ***(Kim et al., 2020).***

Fatigue can be a consequence of motor dysfunction in PD or it is directly related to the neuropathology, as it can be observed in treated patients with good motor function. The