THE ASSOCIATION BETWEEN THE LEVEL OF VITAMIN K2 IN BLOOD AND THE SEVERITY OF SYMPTOMS IN IDIOPATHIC PARKINSONIAN PATIENTS

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Introduction

Parkinson's disease (PD) is a progressive neurodegenerative disorder that might result in death, and affects ~1–3% of the global population aged from 40 years to above 60 years. There are two forms of PD: familial; genetically inherited in either an autosomal dominant or recessive manner, and sporadic (idiopathic); believed to develop from gene-environment interactions. Idiopathic Parkinson's disease (IPD) is the most common neurodegenerative disorder after Alzheimer's disease.

The major motor symptoms of IPD are resting tremor, bradykinesia, rigidity, and postural reflex disturbance. Apart from these dopaminergic motor symptoms, non-motor symptoms also develop secondary to serotonergic, noradrenergic, cholinergic, and autonomic nervous system involvement. Non-motor symptoms include major neuropsychiatric symptoms such as cognitive dysfunction, autonomous disorders, sleep disorders, and sensory symptoms. Underlying many of the motor symptoms of PD is the selective loss of dopaminergic neurons of the substantia nigra pars compacta and their principal axon projections to the striatum.

Aim of the Work

The aim of this study was to investigate the association between circulating level of vitamin K2 and the severity of symptoms in idiopathic Parkinson's Disease patients.

Patients and Methods

The study will be carried out on 40 idiopathic Parkinson's disease patients aged above 40 years old and 20 age and sex matched control. Laboratory investigations. Five mL of venous blood will be collected from each patient and control.

Blood samples will be centrifuged, serum aspirated and stored at -20oC till day of assay. Circulating Vitamin K2 levels will be assayed using enzyme linked immune sorbent assay (ELISA). Vitamin K2 Assay. Kits were manufactured by SinoGeneClon Biotech Co., Ltd. In order to estimate the serum level of vitamin K2, the procedure was strictly performed according to the manufacturer's detailed steps.

Movement Disorder Society (MDS)-sponsored revision of the Unified Parkinson's Disease Rating Scale (UPDRS). Modified Hoehn and Yahr Staging Scale. Modified Parkinson's Disease Sleep Scale (PDSS-2). Montreal Cognitive Assessment Scale (MoCA).

BECK's depression inventory scoring scale. Hamilton Anxiety Rating Scale (HARS). Fatigue Severity Scale (FSS).

Results

Table 1: Comparison between the two studied groups regarding the level of serum vitamin K2.

Serum vitamin K2 level (nmol/L)	Patients group "n=40"	Control group "n=20"
Range	0.29-4.34	0.53-7.5
Mean	2.25	3.6
S.D.	1.32	2.1
t-test	5.26	
p value	0.002*	

Table 2: There was no significant correlation between vitamin K2 level and BDI score, Hamiton Anxiety Rating scale, fatigue severity scale and Montreal Cognitive Assessment Scale (MoCA), while there was a significant correlation with MDS-Unified, Parkinson's Disease Rating Scale and Parkinson's Disease Sleep Scale (PDSS).

Vitamin K2 level #	Correlation coefficient	P value	C.I.
BDI score	-0.095	0.560 N.S.	0.36-2.11
HARS score	-0.292	0.068 N.S.	0.52-1.96
FSS score	-0.018	0.913 N.S.	0.33-1.88
MDS-UPDRS total score	-0.666-**	0.0013*	0.13-0.86
MDS-UPDRS part I score	-0.615-**	0.0026*	0.11-0.76
MDS-UPDRS part II score	-0.692-**	0.001*	0.351-0.902
MDS-UPDRS part III score	-0.691-**	0.001*	0.212-0.821
MDS-UPDRS part IV score	-0.635-**	0.0021*	0.165-0.722
MOCA score	-0.256	0.110 N.S.	0.23-2.11
PDSS score	-0.705-**	0.001*	0.16-0.82
PDSS Motor	-0.809-**	0.001*	0.207-0.993
PDSS Parkinson	-0.668-**	0.0025*	0.123-0.792
PDSS sleep	-0.701-**	0.001*	0.07-0.633

Conclusion

The findings of the study may be concluded as follows: There was a significant relationship found between vitamin K2 levels and severity of PD manifestations. Higher vitamin K2 levels significantly correlated with more severe fatigue. A bimodal distribution of vitamin K2 was found among both PD cases and the healthy control subjects. High-cluster vitamin K2 was linked to significantly more severe anxiety symptoms. More severe PD manifestations was associated with worse depression, anxiety, and sleep quality. Depression, the major prodromal symptom of PD, was linked to worse fatigue, anxiety, sleep quality, and PD manifestations.