

## Research Article

# Factors Influencing Functional Dependence in Mexican Patients with Parkinson's Disease

Quintanar-Llanas AB<sup>1</sup>, Ibarra-Gutierrez A<sup>2</sup>,  
Medina-Verastegui LA<sup>1</sup>, Camacho-Sanchez JE<sup>1</sup>,  
Ochoa MC<sup>3</sup> and Ramirez-Leyva DH<sup>4\*</sup>

<sup>1</sup>Department of Family Medicine, Family Medicine Unit #66 (IMSS), Coahuila Delegation, Mexico

<sup>2</sup>Department of General Medicine, Rural Hospital #51 (IMSS), San Buenaventura, Coahuila, Mexico

<sup>3</sup>Department of Pediatrics, Regional General Hospital #1 (IMSS), Sonora Delegation, Mexico

<sup>4</sup>Department of Family Medicine, Family Medicine Unit #1 (IMSS), Sonora Delegation, Sonora, Mexico

\***Corresponding author:** Ramirez-Leyva Diego Hazael, Department of Family Medicine, Regional General Hospital #1 (IMSS), Sonora Delegation, Sonora, México, Colonia Centro, Cd. Obregon, Sonora, Mexico

**Received:** October 29, 2016; **Accepted:** November 21, 2016; **Published:** November 23, 2016

## Abstract

**Background:** The treatment and control of Parkinson's disease (PD) is complex and difficult, due to the impact of multiple factors especially family members.

**Aim:** So the purpose of this study is to know the primary factors that influence dependence in patients with PD.

**Design and Setting:** Comparative cross-sectional study.

**Methods:** In 69 patients with PD in a family medicine unit in Torreon, Coahuila, Mexico, two groups were formed, the dependence group (with a lower Unified Parkinson Disease Rating Scale [UPDRS] score) and the independence group (with a higher UPDRS score), surveys were conducted in obtaining socio-demographic (age, gender) and clinical information (body mass index, time of diagnosis, number of medications used, history of high blood pressure, Diabetes Mellitus, Rheumatoid arthritis and fractures).

**Results:** Patients in the dependence group presented greater time of diagnosis; in the other variables there were not significant differences.

**Conclusion:** In the treatment of patients with PD, it is necessary to consider the time of diagnosis to avoid functional dependence; however, there is another factor to consider in order preventing early dependence as family and contextual variables.

**Keywords:** Parkinson's Disease; Dependence; UPDRS

## Introduction

Parkinson's disease (PD) is a degenerative disorder of the central nervous system. It was first described in 1817 by James Parkinson, a British physician who published an article on what he called "the shaking palsy". In this article, he outlined the main symptoms of the disease that would later be named as him [1]. PD affects more than 1% of the population over 55 years, being more frequent in males (55-60%). Its prevalence increases with age, from 3.1% in subjects between 75 and 84 years. The annual incidence ranges from 4.5 to 21 cases per 100,000 inhabitants. The average age of onset is 55 years [2].

Parkinson's disease occurs when neurons in the substantia nigra die or become impaired. Normally, these neurons are responsible for producing dopamine responsible for transmitting signals between the substantia nigra and striatum, to produce fine movements [1]. In Parkinson's disease, a progressive loss of dopaminergic nigro-striatal neuron, with consequent depigmentation and gliosis; while the surviving neurons Lewy bodies are seen [3]. It has been proposed that neurons have Lewy bodies are those who try to evade the toxic mechanism involved in neurodegenerative diseases such as Parkinson's [4]. There is currently no blood or laboratory tests have been shown to help diagnose Parkinson's disease. Therefore the diagnosis is based on clinical history and a neurological examination. Brain scans, tomography and magnetic resonance on people with Parkinson usually appear normal. There are criteria for the diagnosis of Parkinson's disease including resting tremor, unilateral onset,

progressive course, asymmetry affecting more the side of onset and excellent response to levodopa [2].

The most effective therapy for Parkinson's disease is the drug levodopa. It is very successful in reducing tremors and other Parkinson's symptoms during the early stages of the disease. Levodopa usually helps most with bradykinesia and rigidity. Problems with balance and other non-motor symptoms cannot be alleviated at all. There are other medications for the treatment of Parkinson's, these are the dopamine agonists including bromocriptine, apomorphine, pramipexole and ropinirole, mimic the role of dopamine in the brain. They can be administered alone or with levodopa [1]. There is no way to predict or prevent Parkinson's disease, however, researchers are looking for biomarkers, biochemical abnormalities or brain dopamine receptors (sites on nerve cells that bind to dopamine) to determine if the loss of dopamine activity precedes or follows the degeneration of neurons that make this substance chemistry [4].

## Materials and Methods

A comparative cross-sectional study was carried out, in the family medicine unit #66, of the Mexican Institute of Social Security, located in Torreon, Coahuila, Mexico; in patients with Parkinson disease (PD), which were selected by a consecutive sampling techniques; that met the following inclusion criteria: age between 50 to 89 years, that accepted and signed the informed consent; patients with psychiatric illness and chronic renal failure were not included and eliminated those who did not complete the survey.

**Table 1:** Univariate and bivariate analysis of factors associated with dependence in Parkinson's disease.

Variable		$\mu$	SD ( $\pm$ )	N	%	OR	95% CI	p
Dependence (UPDRS)	Mild			19	27.5			
	Moderate			33	47.8			
	Severe			8	11.6			
Independence (UPDRS)				9	13			
Gender	Men			35	50.7	2.2	0.5-9.9	0.30
	Women			34	49.3			
Diabetes Mellitus	Yes			17	24.6	2.9	0.3-25.1	0.43
	No			52	75.4			
Rheumatoid Arthritis	Yes			6	8.7	0.8	0.9-1.4	1.0
	No			63	91.3			
Hypertension	Yes			25	36.2	2.1	0.4-11.3	0.47
	No			44	32.8			
History of Fractures	Yes			12	17.3	1.1	0.7-1.4	0.34
	No			57	82.7			
Age (years)		72.45	8.6			1.3	0.2-7.3	0.70
Body Mass Index (Kg/m <sup>2</sup> )		27.7	4.5			0.6	0.1-2.7	0.71
Time of diagnosis (years)		7.5	6.3			0.7	0.009-0.6	0.009*

$\mu$ : Mean, SD: Standard Deviation, N: Frequency, %: Percentage, OR: Odds Ratio, CI: Confidence Interval, p: Chi Square, UPDRS: Unified Parkinson's Disease Rating Scale, \*: Statistically significant.

The following data were obtained directly from the patients: age, gender, and treatment, time from onset of Parkinson (considered the approximate date of diagnosis), medical history of fractures and chronic degenerative diseases as Diabetes Mellitus (DM), arterial hypertension (HA) and rheumatoid arthritis (RA). To determine nutritional status, body mass index (BMI) was calculated for which the patients were weighed and measured, on a scale with stadiometer (Transcell technology model TI-540-SL), it was calculated based on the Quetelet index ( $BMI = \text{weight}/\text{talla}^2$ ). Disability was assessed with the questionnaire Unified Parkinson Disease Rating Scale (UPDRS). UPDRS it is a tool to classify the degree of dependence in patients with Parkinson; it consists of three sections: mental status, motor function and activities of daily living evaluated with direct interview. The punctuation goes from 0 to 176 points, with lower scores there is less dependence. It is validated in Spanish with a Cronbach's alpha of 0.93 [5].

The data obtained was integrated into data collection sheets and analyzed using the SPSS program version 20 in Spanish, where we applied descriptive statistics for qualitative variables use frequencies and percentages and for quantitative variables mean, median, mode and standard deviation were used. The patients were divided into two groups, dependence and independence considering UPDRS score. It was considered a  $p < 0.05$ , with a 95% confidence interval, all variables were dichotomized to apply odds ratio and chi square. The Protocol was authorized by the Local Committee of Research and Ethics in Health Research from the Family Medicine Unit #66, where the study took place.

## Results

We analyzed a sample of 69 patients, of whom 34(49.3%) were women and 35(50.7%) men. The average age was  $72.45 \pm 8.6$

(50-89) years, the time of diagnosis of the patients was on average  $7.54 \pm 6.3$  (1-30) years. Out of the 69 patients, 25(36.2%) suffered from hypertension; 17(24.6%) Diabetes Mellitus and 6(8.7%) rheumatoid arthritis; 61 (89.2%) consume 4 prescription drugs or more; 12(17.3%) have medical history of fractures, the BMI was an average of  $27.7 \pm 4.5$  (19.1-36.1) kg/ m<sup>2</sup>. With respect to the degree of dependence, 9(13.0%) were independent, 19(27.5%) had mild dependence, 33(47.8%) moderate dependence and 8(11.6%) severe dependence (Table 1).

Groups were classified according to dependence (UPDRS score) and they were statistically significant differences just in time of diagnosis 1-5 year against six or more years ( $p=0.009$ ,  $OR=0.7$  95%CI [0.009-0.66]). In the other variables there was not significant differences as age ( $p=0.70$ ,  $OR=1.3$  95% CI [0.2-7.3]), gender ( $p=0.30$ ,  $OR=2.2$  95%CI [0.5-9.9]), DM ( $p=0.43$ ,  $OR=2.9$  95%CI [0.3-25.1]), HA ( $p=0.47$ ,  $OR=2.1$  95%CI [0.4-11.3]), RA ( $p=1.0$ ,  $OR=1.1$  95%CI [0.9-1.4]), history of fractures ( $p=0.34$ ,  $OR=1.1$  95%CI [0.8-1.4]) and obesity ( $p=0.71$ ,  $OR=0.6$  95%CI [0.1-2.7]) (Table 1).

## Discussion and Conclusion

It is necessary to consider another variable as emotional aspect and adequate or inadequate coexistence with family to make a patient with PD and the family feels the need and desire to have a better control of their disease. Parkinson's disease is complex and must be addressed from all individual and environmental factors, since access to health services and the availability of the drug do not guarantee adequate control. The family environment is an important aspect that needs to be considered by the treating physician of the patient as part of intervention in PD and emphasize the time of diagnosis as a risk factor for dependence in a PD patient, evident in this study. Future comprehensive interventions involving patient with PD

within family and social dynamics are required, to be able to influence positively the key factors for the evolution of the disease, regardless of other interventions such as the promotion of health, treatment and prevention of complications.

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