Determinants of the quality of life in Parkinson's disease: Results of a cohort study from Southwest China

Ying Wu, Xiao Yan Guo, Qian Qian Wei, Wei Song, Ke Chen, Bei Cao, Ru Wei Ou, Bi Zhao, Hui Fang Shang *

Department of Neurology, West China Hospital, Sichuan University, Chengdu, 610041 Sichuan, China

ARTICLE INFO

ABSTRACT

Background: The determinants of the quality of life (QoL) of patients with Parkinson's disease (PD) in Chinese population remain largely unknown.

Methods: A total of 649 PD patients from Southwest China participated in this cross-sectional study. Non-motor Symptoms Scale (NMSS) was used to evaluate the non-motor symptoms (NMS), whereas PD Quality of Life Questionnaire (PDQ-39) was used to assess the QoL of the PD patients. Multiple stepwise regression analysis was conducted to identify the determinants of the QoL.

Results: NMS, H–Y stage, female, disease duration, UPDRS III score, single/divorced/widowed, and motor complications accounted for 66.3% of the variables in the multiple regression analysis and were the negative determinants of the QoL. Among these variables, NMS and H–Y stage accounted for 46.7% and 14.5%, respectively. NMS were closely associated with each domain of PDQ-39. Female sex especially predicted poor emotional well-being and bodily discomfort, whereas single/divorced/widowed especially predicted poor stigma and social support of PD patients. Comorbidity, motor complications and rural living predicted poor mobility, activities of daily living and emotional well-being, respectively.

Conclusion: Both demographic and disease-specific factors influence the QoL in PD patients. NMS are the strongest independent negative determinant of the overall QoL and closely associated with each domain of PDQ-39. The treatment of NMS may help to improve the QoL of PD patients.

© 2014 Elsevier B.V. All rights reserved.

1. Introduction

Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by cardinal motor symptoms including tremor, rigidity, bradykinesia, and postural instability. The prevalence of PD in the population aged 65 years and over is 1.7% in China [28]. Current demographic projections suggest that the aging population (≥ 65 years) in China will increase rapidly in the next 30 years, from 8.87% of the total population in 2010 to 22.6% in 2040 [11,12]. Thus, the burden of PD becomes considerably increasing.

The health related quality of life (QoL) may be defined as the perception and evaluation by the patients themselves on the impact caused by the disease and its consequences on their lives [15]. The evaluation of the QoL is essential in chronic and disabling disease especially in patients with PD. In previous studies, the impacts of both motor and non-motor symptoms (NMS) on the QoL of PD have been given increasing attention [1,7,14,16,18–20,24–26,29,30]. Aside from these two factors, other possible determinates, such as age of onset, gender, residence, comorbidity, education, and marital status on the QoL of PD have also been increasingly studied in recent years [7,8,13,17,20,25,

26]. However, some of the results of these studies are not consistent. For example, some studies have found female sex as a risk factor of worsening the QoL [1,8,13], but has not been observed in other studies [7,25,29]. Furthermore, few studies have addressed the impact of onset age on the QoL of PD [1,13,17].

Meanwhile, the determinants for the QoL of PD remain largely unknown in the Chinese population. Only two studies have focused on the correlations between NMS, motor symptoms, and the QoL of the Chinese PD patients from Beijing and Guangzhou. Although NMS have a key role on the impact of the QoL in Chinese PD patients [14,18], other factors, such as age of onset, gender, education, comorbidity, and residence have not been studied in Chinese PD patients. Therefore, we carried out a cross-sectional study with a large sample, including PD patients across various disease durations and severities to reveal the potential determinants on the QoL of PD.

2. Patients and methods

This study is a cross-sectional survey of PD patients who were consecutively recruited from the Department of Neurology, West China Hospital of Sichuan University between Jun 2009 and Dec 2012. All PD patients were diagnosed according to United Kingdom PD Society Brain Bank Diagnostic Criteria [6].

* Corresponding author at: Department of Neurology, West China Hospital, Sichuan University, No. 37 Guoxue Road, Chengdu, Sichuan 610041, China. Fax: +86 28 85423550.
E-mail address: hfshang2002@163.com (H.F. Shang).

All PD patients were evaluated face to face by the members from a team specialized in movement disorders. Demographic information, including age, gender, current marital status, years of education, residence (we divided the patients into rural and urban living groups), comorbidity (we considered "positive" when PD patients suffered from systemic diseases, such as diabetes mellitus, cardio-vascular–respiratory system, gastrointestinal system, or neuropsychiatric system), age of onset (early-onset: <50 years old; late-onset: ≥50 years old), disease duration, and daily levodopa dosage were recorded. All patients were assessed by the Unified PD Rating Scale part III (UPDRS III) [4], the modified Hoehn and Yahr staging (H–Y stage) [9], the Mini-mental State Examination (MMSE, the maximum score is 30) [27], and Chinese version of Non-motor Symptoms Scale (NMSS, the maximum NMS score of 360 indicates higher severity and frequency) [23]. Motor complications, including motor fluctuations and dyskinesia, were evaluated by UPDRS part IV, and the presence or absence of psychiatric symptoms, such as hallucinations, delusions, illusions or psychosis was also recorded.

The Chinese version of PDQ-39 from Oxford Outcomes was used to assess the QoL of the PD patients. PDQ-39 comprises eight domains: mobility, activities of daily living (ADL), emotional well-being, stigma, social support, cognition, communication, and bodily discomfort. Responses are scored in a scale from 0 (never) to 4 (always). Each domain score is transformed into a 0–100 scale by summing the scores of each question in the domain, divided by the maximum possible raw score, and then multiplied by 100. The PDQ-39 summary index (PDQ-39 SI) is then obtained by calculating the mean of the eight domain scores [10]. Higher scores indicate poorer QoL.

Patients who met the following criteria were excluded: 1) PD patients with insufficient social-demographic information and lacked the evaluation of PDQ-39; 2) PD patients who came from other areas, not from Southwest China; and 3) PD patients with deep brain stimulation (DBS) operation before being registered. All patients signed the informed consent and the Ethics Committee of Sichuan University approved this study.

3. Statistical analysis

Continuous variables are presented as mean ± standard deviation (SD), and categorical variables are presented as percentage (%). Wilcoxon test was used for binary variables analysis. The correlations between the clinical features and PDQ-39 SI and each domain of PDQ-39 were analyzed by Spearman Rank correlation analysis. We considered $P < 0.05$ as significant. The correlation strength was interpreted as follows: $r_S \geq 0.4$ means obvious significance, $0.3 \leq r_S < 0.4$ means moderate significance, and $r_S < 0.3$ means mild significance. Statistically significant variables revealed in the univariate analysis were entered into a multiple stepwise regression analysis. PDQ-39 SI and each dimension score acted as the dependent variable. Entry and removal of independent variables in every step were set at a level of 0.05 and 0.1, respectively. SPSS version 19.0 (SPSS Inc., Chicago, IL) was used for data analysis.

4. Results

A total of 649 PD patients were included in the current study. The demographic and clinical features are listed in Table 1. The mean age of the patients was 61.7 ± 11.8 years, including 365 (56%) males. Late-onset patients accounted for 73.8%. The mean disease duration was 4.8 ± 4.2 years. The mean years of education was 9.2 ± 4.7 years. One hundred and ninety patients (29.3%) had systemic comorbidities and 224 (34.5%) patients had motor complications. The mean scores of UPDRS III, NMSS, and PDQ-39 SI were 32.9 ± 16.1, 35.5 ± 32.7, and 21.7 ± 16.7, respectively.

The univariate analysis of the PDQ-39 SI and each domain are listed in Table 2A. Female sex, single/divorced/widowed, rural living patients, as well as patients with psychiatric symptom and motor complications

Table 1
Demographic and clinical features of the PD patients.

Variable	Mean ± SD	Minimum–maximum
Age (y)	61.7 ± 11.8	19.9–83.3
Gender		
Male, n (%)	365 (56.2)	
Female, n (%)	284 (43.8)	
Onset age (y)		
<50, n (%)	170 (26.2)	
≥50, n (%)	479 (73.8)	
Marital status		
Married, n (%)	628 (96.8)	
Single/divorced/widowed, n (%)	21 (3.2)	
Rural living, n (%)	231 (35.6)	
Comorbidity, n (%)	190 (29.3)	
Education (y)	9.2 ± 4.7	0–21
Disease duration (y)	4.8 ± 4.2	0.2–27.9
Daily levodopa dosage (mg/d)	318.7 ± 231.4	62.5–2400
H–Y stage	2.5	1–5
UPDRS III	32.9 ± 16.1	1–86
NMSS	35.5 ± 32.7	0–208
MMSE	25.9 ± 4.0	7–30
Psychiatric, n (%)	100 (15.4)	
Motor complications, n (%)	224 (34.5)	
PDQ-39 SI	21.7 ± 16.7	0–84.6
Mobility	24.8 ± 28.9	0–100
ADL	24.2 ± 26.4	0–100
Emotional well-being	24.9 ± 22.9	0–87.5
Stigma	21.8 ± 26.8	0–100
Social support	7.1 ± 16.1	0–91.7
Cognition	23.7 ± 18.5	0–100
Communication	12.0 ± 17.6	0–100
Bodily discomfort	21.6 ± 20.9	0–100

Abbreviations: ADL = activities of daily living; NMSS = Non-motor Symptoms Scale of Parkinson's disease; MMSE = Mini-mental State Examination; PDQ-39 SI = the Parkinson's Disease Quality of Life Questionnaire summary index; UPDRS III = Unified Parkinson's Disease Rating Scale motor examination.

tended to have higher PDQ-39 SI score ($P < 0.05$). No difference in PDQ-39 SI was observed between the early-onset and late-onset PD patients, as well as patients with and without comorbidity. However, late-onset patients had higher scores in the mobility, ADL, and stigma domains than the early-onset patients, and this difference was also presented between patients with and without comorbidity. Late-onset patients and patients with psychiatric or motor complications had significantly higher score of cognition domain ($P < 0.01$). Female patients, rural living patients, or patients with motor complications had significantly higher scores of emotional well-being and bodily discomfort domains ($P < 0.01$). Patients with single/divorced/widowed or with motor complications had higher scores in stigma and social support domains ($P < 0.05$).

The Spearman correlations between the clinical features and PDQ-39 SI and the eight domains are shown in Table 2B. Obvious correlations between NMSS, H–Y stage, UPDRS III, disease duration, and PDQ-39 SI were found ($0.4 < r_S < 0.7$, $P < 0.01$). Mobility and ADL domains were significantly correlated with H–Y stage, UPDRS III and disease duration ($0.4 < r_S < 0.7$, $P < 0.01$). Emotional well-being, stigma, cognition, communication and bodily discomfort domains were only significantly correlated with NMSS ($0.4 < r_S < 0.7$, $P < 0.01$). PDQ-39 SI, mobility, ADL, emotional well-being, cognition and bodily discomfort domains were moderately and negatively correlated with the years of education and MMSE score ($-0.1 < r_S < -0.4$, $P < 0.01$).

The stepwise regression analysis outcome is shown in Table 3. All variables, including NMSS, H–Y stage and UPDRS III, disease duration, female, single/divorced/widowed, and motor complications were determinants for PDQ-39 SI. The final corresponding model accounted for 66.3% of the variables, NMSS accounted for 46.7%, and H–Y stage accounted for nearly 15%. The corresponding model accounted for the variables in mobility, ADL, emotional well-being, stigma, social support, cognition, communication, and bodily discomfort domains of 50%, 50.1%, 43.2%, 25.8%, 10.4%, 41.8%, 31.3%, and 24.3%, respectively. In