Profile of Generic and Disease-Specific Health-Related Quality of Life Among Nigerians with Parkinson's Disease

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ABSTRACT

BACKGROUND

There is mounting evidence that Parkinson's disease causes significant disability and impairs health-related quality of life. However, this dimension has not been fully characterised, particularly among Africans. We examined the generic and disease-specific health related quality of life profiles of Nigerian Africans with Parkinson's disease in comparison to demographically-matched controls.

METHODS

Thirty-six consecutive Nigerian patients with Parkinson's disease were assessed using a battery comprising of the Parkinson's disease questionnaire-39 (a disease-specific instrument), and the EQ-5D (a generic instrument whose maximum score of 1.00 indicates best quality of life). A structured questionnaire interview and a complete neurological examination including the Hoehn and Yahr stage of illness scale and the motor section of the Unified Parkinson's Disease Rating Scale were performed on the same day. Thirty-sixages and gender- matched apparently healthy controls were also assessed.

RESULTS

There was no significant difference in age between the patients (64.3 + 10years) and controls (63.7 + 9 years). The patients had significantly poorer EQ-5D score (0.31 + 0.23) compared to the controls (0.84+ 0.12 for the controls, P< 0.001). The Parkinson's disease questionnaire-39demonstrated poor quality of life in patients with the poorest performances in the mobility, activities of daily living and emotional well-being dimensions. However the social support dimension was not impaired.

CONCLUSION

Patients with Parkinson's disease had much poorer generic and specific health related quality of life in comparison to their healthy counterparts. Management should be multi disciplinary in order to holistically improve quality of life in all affected domains.

KEYWORDS

Parkinson's disease; Health Related Quality of Life; Nigeria

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INTRODUCTION

More than 180 years ago, James Parkinson first described the disorder that bears his name. Parkinson's disease (PD) is one of the most common neurodegenerative diseases of insidious onset in middle or late age[1]. Mortality is two to five times as high among affected persons as among age-matched controls[2-4], resulting in a marked reduction in life expectancy[6].Indeed, neurodegenerative diseases including PDare projected to surpass

cancer as the second most common cause of death among the elderly by the year 2040[5]. PD as described by James Parkinson, was thought to cause only motor symptoms. Non-motor features particularly the psychosocial manifestations, which can be more disabling than the motor symptoms themselves, are ignored. Patients with PD do suffer restrictions in mobility, falls, emotional disorders, depression, psychosis, cognitive impairment, social embarrassment, isolation, sleep disturbances, and fluctuations[6]. Therefore, there is mounting evidence that PD can cause significant disability, impairing physical, emotional, psychological and socioeconomic functioning thereby reducing health-related quality of life (HRQOL)[6-12].

However, the concept of HRQOL in PD is relatively new. So the actual impact of PD on different domains of HRQOL has not been fully characterised, particularly among Africans. The descriptions in literature are mostly incomplete and inconsistent. Few studies have concurrently explored the impact of PD on generic and specific HRQOL in comparison to matched healthy controls.

Therefore, we aimed to examine the HRQOL profiles of Nigerian Africans with PD in comparison to demographically-matched controls using both generic and disease-specific instruments. We hypothesized that PD patients will have worse HRQOL than their healthy counterparts.

METHODS

Subjects

We studied 36 patients with clinical diagnosis of PD who were consecutively recruited in 2009 from the Neurology outpatient clinic of the University of Port Harcourt Teaching Hospital (UPTH), Nigeria. The diagnosis of PD was based on the United Kingdom (UK) Parkinson's Disease Society Brain Bank Clinical Diagnostic Criteria[13,14]. Patients with history of stroke, significant head injury, previous encephalitis, drug and alcohol abuse were excluded. Those on neuroleptic treatment, methyl- dopa and reserpine at the onset of symptoms were also excluded. Other patients with Parkinsonism plus syndromes, cognitive impairment before 1 year of onset, supranuclear gaze palsy, cerebellar signs or negative response to levodopa were excluded.

Thirty-six controls matched for age and sex were recruited. For every patient, we looked for a control with the same gender and age +/- 2 years. They comprised apparently healthy volunteers without Parkinsonism or any other known medical or psychological disease.

Informed written consent was obtained from all recruited subjects. Ethical approval to undertake the study was obtained from the UPTH Ethics Committee.

Sample size estimation

The minimum sample size of patients required for the study was 28, calculated based on the method of Kish[15]. The standard normal deviation (z) was set at 1.96, which corresponds to the 95% confidence interval. The proportion of patients with PD (p) was estimated at 59 per 100,000 [16], while the absolute deviation from p% that will be tolerated (d) was set at 0.009.

Instruments

The Parkinson's disease questionnaire - (PDQ-39) [17]. The PDQ-39, comprising 39 items, is the most widely validated and most widely used disease specific instrument employed in studies of PD patients[17-20]. It has eight subscales/dimensions: mobility (10 items), activities of daily living (6items), emotional well being (6 items), stigma (4 items), social support (3 items), cognition (4 items), communication (3 items) and bodily discomfort (3 items). Items in each subscale, as well as in the total scale, can be summarized into an index and transformed linearly to a 0-100 scale[17,19]. Higher scores indicate poorer health-related quality of life.

Euroqol-5d (EQ-5D)[21]

The EQ-5D is a short generic HRQOL questionnaire with five questions on mobility, self-care, pain, social activities, and

psychological status and three possible answers for each item (1=no problem; 2= moderate problem: and 3= extreme problem)[21].

A summary index with a maximum score of 1 can be derived from these five dimensions by conversion with a table of scores. The maximum score of 1 indicates the best health state, in contrast to the scores of individual questions, where higher scores indicate more severe or frequent problems. In addition, it has a Visual Analogue Scale (VAS) to indicate the general health status with 100 indicating the best health status.

Test procedure

We conducted a pilot study among 10 patients and 10 matched controls to validate PDQ-39 version 1.1 which had not been validated in Nigeria. Those who participated in the pilot study were similar to overall sample in terms of age, sex and marital status. To assess its test-retest reliability the PDQ-39 was administered twice to the patients at an interval of one week to minimize the subjects' recall of the previous answers.

Subsequently, consecutive eligible patients as well as age- and sex-matched controls were assessed using standardized questionnaires to obtain demographic information, medical history, previous psychiatric history and history of use of alcohol consumption. The questionnaire also assessed disease-related variables such as age at onset of disease, duration of the disease, duration of treatment and profile of motor and non-motor features of PD.

On the same day of the clinic visit a detailed neurological examination was performed on the patients to verify the clinical diagnosis of PD. The stage and severity of the disease was determined by using the Hoehn and Yahr staging scale[22] and the motor part of the Unified Parkinson's Disease Rating Scale (UPDRS)[23]. Thereafter, all recruited patients had a complete HRQOL battery consisting of the PDQ-39[17] and EQ-5D[21] administered to them. The EuroQOL-5D is a widely used generic quality of life instrument allowing comparisons between different patient groups and the general population. It was validated briefly and administered to the control group as well.

All questionnaires were administered in English language, a language spoken and understood by eligible patients.

Statistical analysis

Summary and dimension scores of the various instruments were calculated according to their individual scoring algorithms[17,21]. Psychometric attributes were generated from the pilot study using standard techniques. Internal consistency was assessed by Cronbach's alpha and item-total correlations. The criteria for acceptability included a Cronbach's alpha of > 0.70 and item-total correlations >0.30 [17]. Test-retest reliability which measured the stability of the instrument was assessed using the product-moment correlation between individual participant's test scores and retest scores. A correlation coefficient of >0.75 was deemed acceptable[17].

Construct validity was assessed by examining the correlation of the overall PDQ-39 score to the EQ-5D and its VAS scale. The difference in mean scores between the sample of patients with Parkinson's disease and the reference population were tested using the Students t-test. Chi square tests were used for categorical variables. A P-value of 0.05 or less was considered statistically significant. Data was analysed using the SPSS version 15.0

RESULTS

Demographic characteristics

The sample consisted of 36 patients with Parkinson's disease (PD) and 36 healthy controls, comprising 27 men and 9 women in the PD group while the control group consisted of 28 men and 8 women. There was no significant difference in the mean age of the patients with PD (64.3 + 10.9 years) compared to controls (63.7 + 9.2years)(P = 0.83).

More than half of both groups were married (77.8% and 83.3% respectively). Fifteen (41.7%) PD patients as against 24 (66.7%) controls were in paid employment. More than half of the PD subjects (58.3%) were retired.

Clinical characteristics

The mean age at onset of PD was 60.8 years (+ 10.5years) with a range of 39 – 80 years. The onset was before the age of 60 years in sixteen (44.4%) patients.

The mean Hoehn and Yahr stage was 3.19(+ 0.6) while the mean UPDRS score was 44.3 (+ 14.2) (table 2).The mean duration of PD was 3.5 (+ 3.1)years. Twenty-five (69.4%) patients had had the disease for more than 2 years and about the same number (24 (66.7%) had been on treatment for a year or more.

Psychometric parameters of PDQ-39

PDQ-39 demonstrated good content validity because it reflected most of the key aspects of HRQOL that were important and specific to the patients themselves. It comprised subscales that represent the physical, functional, psychological, and social domains of life. However, many of the patients had additional concerns regarding finance which are not covered by the instrument (PDQ-39). Construct validity was demonstrated by the significant correlation between the overall score for PDQ-39 and EQ-5D (r= -0.47, P=0.004) and its Visual AnalogueScale (VAS) (r=-0.49, P=0.003).

The Cronbach's alpha for the 8 multi-item subscales ranged from -0.02 (social support) to 0.88 (stigma) while the cronbach's alpha for the overall PDQ-39 score was 0.98 (Table 1). Test-retest reliability coefficient (Pearson's correlation coefficient) was high for stigma (r=0.95), emotional well being (r=0.89), cognitive impairment (r=0.86) and bodily discomfort (r=0.82) domains as well as the overall PDQ-39 (r=0.96)(see Table 2).

Profile of HRQOL scores among patients with PD and control subjects. There was significant difference in EQ-5D score between PD patients (0.31+ 0.23) and controls (0.84 + 0.12)(t =12.304, P= <0.001)(Table 3).

There was also significant difference in the VAS score for PD patients (43.4+9.7) compared with controls (77.6 + 13.4) (t =12.447, P = <0.001). Among the patients, the mean scores for mobility, ADL and emotional well being were the highest.

Table 1: Clinical characteristics of study subjects

Characteristics	Frequency	%	Range(years)	Mean+SD
Age at onset of disease (years)	16	44.4	39 -80	60.8 + 10.5
Less than 60	20	55.6		
60 and above				
Duration of disease				
Less than 2 years	11	30.6	0.4-14	3.5 + 3.1
2 years or more	25	69.4		
Duration of treatment(years)	12	33.3	0.02-9	2.0 + 2.3
Less than 1 year	24	66.7		
1 year or more				
Severity of PD Hoehn and Yahr				
Stage I	0	0		
Stage II	2	5.6		
Stage III	26	72		
Stage IV	7	19.4		
Stage V	1	2.8		
UPDRS(motor part)				44.3 + 14.2

Table 2: Reliability, Test-retest and Variability of PDQ-39 for patients with Parkinson's disease

Scale	No of items	Cronbach's Alpha(N=36)	Test-retest (N=10)	Mean score	SD	Observed Range
Mobility	10	0.78	0.65	63.0	19.34	22.5-100
Activities of daily Living	6	0.79	0.50	61.80	23.45	16.67-100
Emotional well-Being	6	0.72	0.89	67.31	18.23	29.16-100
Stigma	4	0.88	0.95	58.51	58.51	0-100
Social Support	3	-0.02	0.32	12.96	12.96	0-50
Cognitive impairment	4	0.64	0.86	39.93	39.93	0-100
Communication	3	0.72	0.26	42.59	42.59	0-100
Bodily discomfort	3	0.56	0.82	58.24	58.24	0-100
PDQ-39 Overall Score	39	0.98	0.96	49.91	13.66	22.45-81.46

Table 3: Comparison of PDQ-39 (overall and subscale scores), EQ-5D and VAS scores between cases of PD and controls.

Measure	PD Group (mean + SD)	PD Group Range	Control Group (mean + SD)	t	p value
EuroQOL-5D	0.31 + 0.23	0.02- 0.74	0.84 + 0.12	12.304	< 0.001
Visual Analogue Scale	43.4 + 9.7	20-60	77.6 + 13.4	12.447	< 0.001
Overall PDQ-39	49.9 +13.7	22.5- 81.5			
Mobility	63 + 19.3	22.5- 100			
Activities of daily living	61.8 + 23.5	16.7- 100			
Emotional wellbeing	67.3 + 18.2	0- 100			
Stigma	58.5+ 33.7	0- 50			
Social support	13+ 14.9	0- 50			
Cognitive impairment	39.9+ 23.1	0- 50			
Communication	42.6+ 25.4	0- 100			
Bodily discomfort	53.2+ 24.8	0- 100			

DISCUSSION

The concept of quality of life is ambiguous and still evolving particularly in Nigeria, where- "to the best of the authors' knowledge"- no study on quality of life in PD was carried out prior to this study. In addition to a generic measure, we utilised the PDQ-39 which showed acceptable psychometric attributes.

Psychometric attributes of the PDQ-39

The PDQ-39 assessed most of the physical, functional, psychological, and social concerns of the people with PD. However, its content validity will likely be enhanced by the adjustment of items in the social support subscale to include relationship of the subjects with extended family members. This appears to be a more important area of concern to the PD population in Port Harcourt and in other parts of the developing world where the extended family system is still strong. Personal finances were also important issues for many of the subjects, but an argument against their inclusion in the assessment of HRQOL is that these areas are encompassed by general QOL and fall outside the purview of HRQOL[24,25].

The PDQ-39 demonstrated good construct validity by its overall score correlation with mean scores of EQ-5D and its VAS. The high correlations, demonstrated by the scale, between items of the same subscales, and between the subscales and the overall scale, suggest that the items and the subscales measure the same construct.

Five of the subscales of the PDQ-39 and the overall scale demonstrated good internal consistency comparable to the levels reported by the original developers of the inventory. However, the social support (-0.02), cognitive impairment (0.64) and bodily discomfort (0.56) subscales had Cronbach's alpha values lower than 0.70. Similar results were reported in a study conducted to validate the Spanish version of the PDQ-39 which showed that Cronbach's alpha for social support and cognition domains were beneath ideal values[26]. This calls to question the concept underlying these domains particularly the social domain in developing countries like Nigeria where support from extended family members is considered very crucial.

The low Cronbach's alpha value for the cognition and bodily discomfort subscales could probably be accounted for by lack of clarity of some of their items. In the cognition domain for example, item 4 ("Had distressing dreams or hallucinations?") could be better stated in simpler terms. In addition, subscale weighting should be revised for different populations because level of importance of different subscale differs from culture to culture[26].

Test retest reliability was generally high in agreement with values reported by the developers of the PDQ-39[17].

Profile of HRQOL among PD patients in Nigeria

This is the first study providing both generic and disease-specific HRQOL profile of patients with PD in comparison with apparently healthy controls in Africans.

Most studies used generic inventories alone which do not address key areas of concern in

patients with PD[11,27]. The use of PD-specific instrument is more sensitive to the nuances of the disease and addresses major areas of concern from the patient's perspective[17]. Few studies used disease-specific instruments alone or in combination with generic instruments[27,28]. Furthermore, fewer studies had examined HRQOL in adults with PD in comparison with a reference healthy population[11,12].

One of such studies was conducted by The Global Parkinson's Disease Survey (GPDS) Steering Committee which undertook a cross-sectional, random, multicenter international survey of patients with PD, their care-givers, and clinicians. They conducted face to face interviews with subjects in six countries and recruited 1,020 patients with PD to represent PD population in these countries[29]. Since no African country was involved, one can argue that due to cultural differences, the profile of HRQOL in PD patients may differ among Africans, thus justifying this study.

In our study, PD patients clearly demonstrated poorer HRQOL than their healthy counterparts. This has been a fairly constant finding in studies that have compared HRQOL in both groups, irrespective of culture, race or country's resource status[9,24,27,28,31]. The mean index score of the EQ-5D in patients with PD was about one third that of the control group. This is similar to what was reported by Shrag et al[28]. All the spheres of daily life (mobility, self-care, ADL, etc) were affected compared to the control group in which pain/discomfort were the major complaints.

The large difference of HRQOL between the healthy control group and the patients with PD was also seen in the VAS of the EQ-5D.

In agreement with previous studies [12,28],HRQOL in patients with PD was also found to be poor in this study using the PDQ-39. Most domains of HRQOL were affected including mobility, ADL and emotional well being which demonstrated the worst HRQOL. A similar result was obtained in a study of PD patients attending a neurology clinic in the UK [31]wherethe non-clinic attendees had worse HRQOL in the mobility, ADL and emotional well-being domains.

In our study, the social support dimension of the PDQ-39 was relatively spared. This is probably because in Africa, the extended family system still operates such that most patients would have adequate support from their close relatives as well as members of the extended family. This preservation of the social domain of the HRQOL is supported by Fitzpatrick et al[31] who found that social support, as measured by the PDQ-39, is less strongly related to clinical assessments of disease severity. This implies that the individuals' with close ties and support from their spouse and partners are less affected by disease severity. However, due to poor reliability of the PDQ-39 in this subscale, new instruments should be developed to confirm these findings.

Limitations

The PDQ-39 lacks items on self-image, night time sleep problems, sexual activity and finances which were major concerns for our patient. It also did not adequately assess some of the domains particularly the social domain. However the PDQ-39 is the scale that has been most tested and used in the largest number of studies and has adequate clinometric characteristics which warranted its use in this study.

CONCLUSION

The PDQ-39 demonstrated an overall moderate internal consistency reliability, good test-retest reliability and satisfactory construct validity among Nigerian Africans with PD. However more items are needed to enhance its content validity and reliability particularly in the social domain. Nigerian Africans patients with PD (EuroQOL-5d=0.31) had severely impaired generic HRQOL compared to apparently healthy controls (EuroQOL-5D=0.83). Most of the impairment manifested in mobility, emotional

well-being and ADL domains. However the social support domain was relatively spared probably due to support from members of the extended family. In the management of PD patients, holistic care targeted at improving mobility, emotional well being and performance of ADL is required to improve their HRQOL.

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