

# Prognosis Factors of Urinary Quality of Life in Parkinson Disease

**Ngor Side Diagne<sup>1\*</sup>, Sakhi Othman<sup>2</sup>, Ababacar Mamadou Gueye<sup>1</sup>, Marie Jeanne Sakho<sup>1</sup>, Fatou Dialo Mboup<sup>1</sup>, Amélie Ndeye Makarame Sy<sup>1</sup>, Papa Ndiouga Lo<sup>1,3</sup>, Ba Seydina Ousmane<sup>4</sup>, Anna Modji Basse<sup>5</sup>, Maouly Fall<sup>2</sup>, Adjaratou Dieynaba Sow<sup>5</sup>, Moustapha Ndiaye<sup>5</sup>, Amadou Gallo Diop<sup>5</sup>**

<sup>1</sup>Physical Médecine and Rehabilitation Department, Fann Teaching Hospital, Dakar, Senegal

<sup>2</sup>Neurology Department, Pikine Hospital, Dakar, Senegal

<sup>3</sup>Physical Médecine and Rehabilitation Department, Ibn Rochd Teaching Hospital, Casablanca, Morocco

<sup>4</sup>Physical Médecine and Rehabilitation Department, Military Hospital, Dakar, Senegal

<sup>5</sup>Neurology Department, Fann Teaching Hospital, Dakar, Senegal

Email: \*ngorsidediagne@yahoo.fr

**How to cite this paper:** Diagne, N.S., Othman, S., Gueye, A.M., Sakho, M.J., Mboup, F.D., Sy, A.N.M., Lo, P.N., Ousmane, B.S., Basse, A.M., Fall, M., Sow, A.D., Ndiaye, M. and Diop, A.G. (2024) Prognosis Factors of Urinary Quality of Life in Parkinson Disease. *Open Journal of Therapy and Rehabilitation*, 12, 10-17.

<https://doi.org/10.4236/ojtr.2024.121002>

**Received:** December 5, 2023

**Accepted:** February 3, 2024

**Published:** February 6, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

## Abstract

**Introduction:** Quality of life in Parkinson disease is not necessary linked to motor symptoms. It's correlated of overactive bladders and prostatic symptoms. Prognosis factors of urinary quality of life are unknown. **Objectives:** Our study aims to find prognosis factors of quality of life associated specifically of urinary disorders in PD. **Patients and methods:** We conducted a transversal, analytic and descriptive study in Physical Medicine, and Neurology departments, Fann Teaching Hospital, Dakar and included patients followed for treatment of PD. Urinary disorders, quality of life and functional autonomy were assessed respectively by Urinary Symptoms Profile (USP), Qualiven Short Form, Schwab and England Scale. **Results:** 38 patients presented PD, with a mean age of  $60.89 \pm 13.6$  years and sex-ratio of 2.45. Mean duration of PD was  $3.1 \pm 2.9$  years. Urinary disorders were found in 47.36% and dominated by incontinence (88.88%) and overactive bladders (88.88%) which were minor in more than 55%. Quality of life was impaired in 88.88% of cases. Minor forms (43.75%) were predominant and constraint dimension (50%) was the most severely altered. Prognosis factors for quality of life of urinary disorders were PD stages (0.046) and functional autonomy (0.042). **Discussion and conclusion:** Urinary disorders in PD are common, impaired quality of life, especially the constraint dimension, depends on stage of evolution of PD and functional autonomy of patients.

## Keywords

Urinary, Quality of Life, Parkinson Disease, Dakar

## 1. Introduction

Urinary dysfunction occurs in 27% - 85% of Parkinson disease (PD) patients. Prevalence would be 30% at begin of the disease and 70% after 5 years of progression [1]. Urinary disorders in PD are linked to a dopamine deficiency. Dopamine makes inhibition of cholinergic activity on striatum and bladder [2], and dopamine deficiency in PD, releases activity of detrusor, that explains predominance of overactive bladders symptoms in PD [3] [4] while detrusor hypoactivity symptoms are rarely found [5]. Urinary disorders are associated with significant morbidity, mortality falls, cognitive impairment, and worse motor and non-motor impairment in PD patients. Lower tract urinary symptoms jeopardized relationships, intimacy, and participation in social activities and cause embarrassment, all of which have a profound impact on quality of life [6]. Quality of life in PD, evaluated by HRQOL is not necessary linked to motor symptoms. Some authors suggest that non-motor symptoms affected quality of life, in PD patients treated with DBS [7]. Urinary prognosis factors of quality of life, evaluated with HRQOL, in PD patients with Deep Brain Stimulation are overactive bladders symptoms and international prostate symptoms [7]. If quality of life, evaluated by HRQOL, in patients with PD is known, those according specificity of urinary disorders is unknown. In a context of non-systematic screening of urinary disorders in Senegalese PD and unknown used therapeutics, quality of life associated specifically of urinary disorders could depend on urinary symptoms, functionals limitations and stages of PD.

## Patients and Methods

We conducted a transversal, analytic and descriptive study to December 2022 at June 2023 in Physical Medicine, and Neurology departments, Fann Teaching Hospital, Dakar, Senegal. Study population constituted from neurologic and physical departments consultations registers. Patients received in these departments, between January 2021 to December 2022, presented an asymmetric Parkinson syndrome, improved with dopamine supplementation at the first years of treatment, are diagnosed to Parkinson disease and included. We noted all phone contact of included patient and secondly called them, for administration of questionnaire. The interview was carried out with presence of helper person. Study parameters were socio-demographic data, personal and family pathological history (High Blood Pressure, Traumatic Brain Injury, use of pesticides and others including heart disease, urogenital pathologies) and lifestyle (alcohol, tobacco, drugs...), disease duration, consultation time, inaugural symptoms, clinical form of disease.

## 2. Evaluation

**Hoehn and Yahr scale** used to evaluate progression of symptoms in patients with PD. This scale includes 5 steps according for distribution of symptoms and functional limitations.

**Urinary Symptoms Profile (USP):** It is a valid and reliable scale providing a comprehensive assessment of all urinary disorders and their severity in men and women with incontinence urinary, overactive bladder and dysuria. Severity of urinary disorders is noted by a score.

- **Qualiven Short Form Scale** used for quickly assessing impact of urinary disorders on quality of life in patients with neurological bladders. Qualiven Short Form has 8 items assessing 4 domains as discomfort, constraints, fears, and feeling. Items are rated from 0 to 4. We classed quality of life associated of urinary disorders in 3 groups (minor group with a score under 1.5/4, moderate group with a score of qualiveen ranged between 1.5 - 2.5 and, severe group with a score more than 2.5/4.
- **Schwab and England Daily Living Activity Scale** assessing abilities of patients with reduced mobility. Originally presented at a Parkinson's disease conference, assesses patients' difficulties to perform daily activities or tasks. Results mentioned in percentage.

**Data analysis:** Data were collected on a pre-established sheet. They were entered with Sphinx software version 5.1.0.2, and performed with SPSS (version 23). Descriptive analysis carried out with calculation of frequencies and proportions for qualitative variables and means, standard deviations for quantitative variables.

### 3. Results

Thirty-eight (38) patients presented PD with an average of  $60.89 \pm 13.6$  years. Patients aged between 60 - 69 years were dominant (42.1%) and 18.4% of patients aged under 60 years. The sex-ratio was 2.45. Married patients represented 78.9% and they were active in 55.26%. Familial tremor found in 3 patients and parental consanguinity in 2 patients. Mean of aged onset of PD was 66.26 years and mean duration of disease was  $3.1 \pm 2.9$  years. Parkinson's disease was classified as stages III and IV in 13.2% of patients (**Table 1**). Onset of symptoms was unilateral in 68.4% of patients. Urinary disorders were found in 47.36% of patients with PD. Urinary symptoms were represented by incontinence (88.88%), overactive bladders (88.88%), dysuria (22.22%) and severities were minor respectively at 56.25%; 61.1%; 75% (**Table 2**). Others symptoms found in PD were constipation (90.9%), hypotension (18.2%), asthenia (6.1%) and sweating disorders (12.1%). Anxiety (69.23%) represented most frequent of psychiatric disorders. Others neuropsychiatric disorders were depression (23.07%), hallucination (7.6%). Genito-sexual disorders were noted in 12.1% of patients. Patients with PD were independent between 60% - 90% in 76.33%, dependent between 60% - 40% in 21.1% and dependent at 30% in 2.6%. For specific treatment of PD, 89.5% of patients received Dopamine and 13.2% an agonist of Dopamine. Symptomatic treatment of urinary disorders represented essentially by anti-cholinergic (22.2%). Urinary disorders caused an alteration of quality of life in 88.88%. Alteration of quality of life was minor in 43.75% of patients, moderate (25%) severe (31.25%). Alteration of all dimensions of urinary quality of life, is

**Table 1.** Hoehn and Yahr classification of PD patients.

Stages Hoehn et Yahr	Frequency (%)
I	31.5
II	55.3
III	7.9
IV	5.3
Total	100

**Table 2.** Severity of urinary disorders.

Score of USP Domains	Frequency (%)	
Urinary incontinence/9	1 - 3	56.25
	4 - 6	37.5
	7 - 9	6.25
Overactive bladders/21	1 - 7	61.1
	8 - 15	33.3
	16 - 21	5.6
Dysuria/9	1 - 3	75
	4 - 6	25

mentioned in **Table 3**. Urinary disorders are associated of alteration of social relationships (100%) and professional consequences (62.5%). Prognosis factors for quality of life associated of urinary disorders are mentioned in **Table 4**.

#### 4. Discussion

In our study 38 patients presented PD, with a mean age of  $60.89 \pm 13.6$  years. Mean duration of PD was  $3.1 \pm 2.9$  years. Urinary disorders were found in 47.36% and dominated by incontinence (88.88%) and overactive bladders (88.88%) which were minor in more than 55%. Alteration of quality of life noted in 88.88%. Minor forms (43.75%) were largely predominant and constraint dimension (50%) was the most severely altered. Prognosis factors for quality of life associated of urinary disorders were stages of evolution of PD (0.046) and functional autonomy (0.042).

Prevalence of PD ranged from 10 to around 200 cases/100,000 habitants, with lowest values in Africa. Incidence would be between 1.5 and 26 cases per 100,000 habitants per year with an age of onset of the disease between 50 and 59 years. In our study, the average age was 60.89 years ( $\pm 13.6$ ) and the age range at the onset of the disease was between 40 and 65 years in majority of patients. Ours results is comparable of Wright and Linder studies [8] [9]. Early start of PD, in our patients, suggest more than genetics forms of PD. Explorations of early start Forms of PD must be completed by Molecular Biology. In our study, a male predominance

**Table 3.** Degree of altered Dimensions of SF Qualiveen.

Qualiveen SF dimensions	Frequency of severity groups (%)		
	]0 - 1.5]	]1.5 - 2.5]	>2.5
feeling	56.25	12.5	31.25
fear	50	12.5	37.5
constraint	50	-	50
discomfort	56.25	12.5	37.5

**Table 4.** Prognosis factors of urinary quality of life.

Prognosis factors	Mean of SF Qualiveen	P value	
	30	3	0.263
	40	0.88	0.353
	50	2.92	<b>0.042</b>
Shwab and England score (%)	60	1.13	0.308
	70	1.83	0.906
	80	1.67	0.753
	90	0.5	0.188
	I	0.46	<b>0.046</b>
Hoehn and Yahr Grades	II	1.85	0.294
	II	1.50	0.86
	IV	3	<b>0.83</b>
Overactive bladders score	1 - 7	1.5	<b>0.263</b>
	8 - 15	3	<b>0.35</b>
	16 - 21	2.17	<b>0.136</b>
Anticholinergics	yes	0.72	<b>0.907</b>
	No	0.79	

was noted with a sex ratio of 2.45. Our result is consistent with majority of epidemiological studies which have shown a male predominance [10]. Common form of Parkinson was predominant in our study (65% of cases) and is similarly of Gouider *et al.* study [11] [12]. In our population, urinary disorders were noted in 47.3% of patients with PD. During Parkinson's disease, frequency of urinary disorders is higher than what happened in general population [13] [14]. Prevalence of urinary disorders is estimated at 27% to 87% and would be 30% at the start of the disease and 70% after 5 years of progression [1] [3]. Our patients were mainly at beginning of illness, which could explain our rate of urinary disorders. According to literature data, irritative urinary signs are more frequent in Parkinson's disease [1] [14], **because** Dopamine make inhibition of cholinergic

activity on striatum and bladder [2] and deficiency in PD patients release activity of detrusor, that's explain predominance of overactive bladders symptoms in PD [3] [4] while detrusor hypoactivity symptoms are rarely found [5]. Urinary disorders in PD are frequently severe [15]. In our study, urinary disorders were severe in 31.25% of case. Short duration of disease can explain our results according to severity of urinary disorders. At begin of disease, urinary disorders are minor in PD, and not often related by patients, which are more preoccupied to motor symptoms. At this stage, urinary disorders diagnosis really needs a questionnaire. According to literature data, urinary disorders in PD have a negative impact in quality of life and on the economic level. A Canadian study, comparing a control group to a group of PD, demonstrated a clear correlation between urinary disorders and quality of life, specifically in physical and emotional dimensions [16]. In a Tunisian study, urinary disorders were correlated with an impairment of quality of life [17]. In our study, quality of life associated with urinary disorders was impaired in 88.88% of patients with PD. The most severely impaired areas are constraint (50%). In Senegalese people, disease considered to a personal and restrictive information. Frequent need to use toilet, due to overactive bladders symptoms, could lead to the knowledge of the disease by society. Thus, patients prefer to isolate themselves and these participated in alteration of social relationships (100%) and professional consequences (10 cases/16). Lower tract urinary symptoms can jeopardize relationships, intimacy, and participation in social activities and cause embarrassment, all of which have a profound impact on quality of life [6]. Prognosis factors of quality of life associated to urinary disorders are autonomy and evolution stage of disease. In fact, patients with partial dependent, who able to use toilet, are more poor quality of life, linked to urinary disorders. Overactive bladders make a frequent moving to toilet. In stage of total dependance, quality of life according to urinary disorders is less poor because of severity of motor symptoms which make patient unable to go toilet. In literature, quality of life in PD is associated with falls, cognitive impairment, and worse motor and non-motor impairment. Urinary quality of life in patients with PD is inversely proportional at stage of evolution. At the first 5 years, urinary disorders are less severe, and speed work normal. The frequent use of toilets, in African societies, can be interpreted as worse health for the population and contribute to an alteration of patient's quality of life from the moment he is aware that his illness is known to everyone.

## 5. Limits of Study

Limits of study found were:

Unavailability of scales used in national languages, requiring translation at times in the event of difficulty understanding the patient.

Many patients included, were not presented at the appointment.

## 6. Conclusion

Urinary disorders in PD can be frequent symptoms, at the beginning of disease if

they are evaluated by a urinary scale. Urinary symptoms of PD are dominated by overactive bladders and with slightly severity, at onset of disease. Quality of life of PD patients is influenced by urinary disorders and most severity domains interested are feeling, constraint and fear. Urinary disorders in PD, contributed for alteration of social relationships and professional activity.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

### References

- [1] Bonnet, A.M., Pichon, J., Vidailhet, M., Gouider-Khouja, N., Robain, G., Perrigot, M., *et al.* (1997) Urinary Disturbances in Striatonigral Degeneration and Parkinson's Disease: Clinical and Urodynamic Aspects. *Movement Disorders*, **12**, 509-513. <https://doi.org/10.1002/mds.870120406>
- [2] Lewin, R.J., Dillard, G.V. and Porter, R.W. (1967) Extrapyramidal Inhibition of the Urinary Bladder. *Brain Research*, **4**, 301-307. [https://doi.org/10.1016/0006-8993\(67\)90160-6](https://doi.org/10.1016/0006-8993(67)90160-6)
- [3] Sakakibara, R. (2001) Videourodynamic and Sphincter Motor Unit Potential Analyses in Parkinson's Disease and Multiple System Atrophy. *Journal of Neurology, Neurosurgery & Psychiatry*, **71**, 600-606. <https://doi.org/10.1136/jnnp.71.5.600>
- [4] Soler, J.M. and Le Portz, B. (2004) Les troubles vésicosphinctériens de la maladie de Parkinson. *Annales d'Urologie*, **38**, S57-S61. [https://doi.org/10.1016/S0003-4401\(04\)80009-3](https://doi.org/10.1016/S0003-4401(04)80009-3)
- [5] Evans, C. (1998) Neurological Disorders in the Ageing Population and Their Urological Implications. *British Journal of Urology*, **82**, 71-78. <https://doi.org/10.1046/j.1464-410X.1998.0820s1071.x>
- [6] Chen, Z., Li, G. and Liu, J. (2020) Autonomic Dysfunction in Parkinson's Disease: Implications for Pathophysiology, Diagnosis, and Treatment. *Neurobiology of Disease*, **134**, Article ID: 104700. <https://doi.org/10.1016/j.nbd.2019.104700>
- [7] Yamamoto, T., Uchiyama, T., Asahina, M., Yamanaka, Y., Hirano, S., Higuchi, Y. and Kuwabara, S. (2018) Urinary Symptoms Are Correlated with Quality of Life after Deep Brain Stimulation in Parkinson's Disease. *Brain and Behavior*, **8**, e01164. <https://doi.org/10.1002/brb3.1164>
- [8] Wright Willis, A., Evanoff, B.A., Lian, M., Criswell, S.R. and Racette, B.A. (2010) Geographic and Ethnic Variation in Parkinson Disease: A Population-Based Study of US Medicare Beneficiaries. *Neuroepidemiology*, **34**, 143-151. <https://doi.org/10.1159/000275491>
- [9] Linder, J., Stenlund, H. and Forsgren, L. (2010) Incidence of Parkinson's Disease and Parkinsonism in Northern Sweden: A Population-Based Study. *Movement Disorders*, **25**, 341-348. <https://doi.org/10.1002/mds.22987>
- [10] Gillies, G.E., Pienaar, I.S., Vohra, S. and Qamhawi, Z. (2014) Sex Differences in Parkinson's Disease. *Frontiers in Neuroendocrinology*, **35**, 370-384. <https://doi.org/10.1016/j.yfrne.2014.02.002>
- [11] Gouider-Khouja, N., Belal, S., Hamida, M.B. and Hentati, F. (2000) Clinical and Genetic Study of Familial Parkinson's Disease in Tunisia. *Neurology*, **54**, 1603-1609. <https://doi.org/10.1212/WNL.54.8.1603>

- [12] Stocchi, F., Carbone, A., Inghilleri, M., Monge, A., Ruggieri, S., Berardelli, A., *et al.* (1997) Urodynamic and Neurophysiological Evaluation in Parkinson's Disease and Multiple System Atrophy. *Journal of Neurology, Neurosurgery & Psychiatry*, **62**, 507-511. <https://doi.org/10.1136/jnnp.62.5.507>
- [13] Siroky, M.B. (2003) Neurological Disorders Cerebrovascular Disease and Parkinsonism. *Urologic Clinics of North America*, **30**, 27-47. [https://doi.org/10.1016/S0094-0143\(02\)00114-3](https://doi.org/10.1016/S0094-0143(02)00114-3)
- [14] Araki, I., Kitahara, M., Oida, T. and Kuno, S. (2000) Voiding Dysfunction and Parkinson's Disease: Urodynamic Abnormalities and Urinary Symptoms. *The Journal of Urology*, **164**, 1640-1643. [https://doi.org/10.1016/S0022-5347\(05\)67048-6](https://doi.org/10.1016/S0022-5347(05)67048-6)
- [15] Schapira, A.H.V., Chaudhuri, K.R. and Jenner, P. (2017) Non-Motor Features of Parkinson Disease. *Nature Reviews Neuroscience*, **18**, 509. <https://doi.org/10.1038/nrn.2017.91>
- [16] Karlsen, K.H., Larsen, J.P., Tandberg, E. and Maeland, J.G. (1999) Influence of Clinical and Demographic Variables on Quality of Life in Patients with Parkinson's Disease. *Journal of Neurology, Neurosurgery & Psychiatry*, **66**, 431-435. <https://doi.org/10.1136/jnnp.66.4.431>
- [17] Emna, T., Bayrem, H., Attia, R., Riahi, S., Boukhchina, R., Bouguila, H., *et al.* (2021) Troubles vésico-sphinctériens, troubles sexuels et qualité de vie chez les parkinsoniens: à propos d'une cohorte hospitalière tunisienne. *Revue Neurologique*, **177**, S24. <https://doi.org/10.1016/j.neurol.2021.02.132>