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Article

Health Outcomes of Dysphagia in Idiopathic Parkinson's Disease (IPD) for 106 Iraqi Patients

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Abstract: Dysphagia is one of the indicators that most negatively affects the general health associated with patients who suffered of Parkinson's disease, which impairs their ability to eat foods in a healthy manner. This study was interesting to assess and analyze health outcomes related to dysphagia for patients with idiopathic Parkinson's disease (IPD). A cross-sectional study was undertaken in several hospitals in Iraq over a span of two years, including during February 3, 2022, until November 26, 2023. The study focused on patients diagnosed with Parkinson's disease who furthermore have dysphagia. The study included an overall of 106 samples, having ages spanning between 50 to 70 years. In addition, this study has effectively established categorizations and assessments for the aim of classifying the degree of severity related to Parkinson's disease, as well as assessing the complexity and intensity of dysphagia among people diagnosed with Parkinson's disease. The results recorded patients with Parkinson's as the most common category at 36.79%; males were higher at 66.98% than females at 33.02%; BMIs were <23.0 at 28.30%; and 24-26 at 37.74%. 36, accounting for 33.96%, 10.38% for smoking patients, and 89.62% for non-smoking patients. The most noticeable symptoms or indicators were tremors, which included 34 patients; Bradykinesia, which included 45 patients, is considered the most common among patients. The most common classification of Parkinson's disease severity in people was behavior, with a score of 69; activities of daily living, with a score of 104; complications of the disease, with a score of 98; and motor examination, with a score of 86. Our results recorded data on the grades and grades of dysphagia associated with Parkinson's disease, where oral motility was normal grade 3, severe grade 1, swallowing reflex involved grade 2, and delay was 1. Dysphagia has a significant influence on the overall well-being of those afflicted by Parkinson's disease, resulting in exerting a negative impact on their daily activities.

Keywords: Dysphagia, Parkinson's disease, Complications, Videofluoroscopy, UPDRS scale

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1. Introduction

Parkinson's disease (PD) was presented as a motor problem, in terms of tremors, bradykinesia, muscular rigidity, and dyskinesias, where many diseases can impact the operations for the oropharyngeal structures involved in swallowing, leading to dysphagia.

Nevertheless, the precise cause of dysphagia in individuals with Parkinson's disease (PD) has not been fully elucidated [1], nor have the specific stages of swallowing that are most impacted [2]. However, it is commonly recognized that dysphagia can manifest in all stages for swallowing [3], in spite of the fact that people with PD often remain asymptomatic as well as frequently unaware of the issue [2], [4], [5].

This phenomenon may result in the expulsion of food or liquids via the oral or nasal passages while the meal stays adhered to the palate and inside the oral cavity, subsequent to the transfer of the bolus to the pharynx. As a result, the process of swallowing may be impacted, perhaps resulting in malnutrition and dehydration [6], [7].

The pharyngeal phase undergoes modifications mostly resulting in a deceleration within the swallowing reflex as well as an elongation of laryngeal motions. During the esophageal phase, the relaxation of the cricopharynx occurs at a gradual pace, resulting in a decrease in the motions of the esophagus. During the process of swallowing, it is possible for a tracheobronchial aspiration along with an airway blockage to occur, resulting in pneumonia in about 50% of instances, with a mortality rate exceeding 50% [8], [9], [10].

Dysphagia issues have a substantial impact on the overall quality of life experienced by individuals with Parkinson's disease [3], [11]. The occurrence rate of this illness may vary depending on the methodology used. Videofluoroscopy examination reveals that 75-100% of individuals with Parkinson's disease have challenges in swallowing [2], [4], [5], [11], [12]. A significant number of patients do not report experiencing dysphagia and instead have quiet aspirations [13].

The extent of dysphagia is contingent upon individual traits and the developmental trajectory of Parkinson's disease. Nevertheless, it is uncommon for patients to have difficulties with hydration or nutrition during the first phases of Parkinson's disease (PD), and the involvement of experts is often delayed until dysphagia becomes a prominent medical concern. The timely identification of dysphagia, along with timely and efficient management, has the potential to mitigate the adverse health outcomes experienced by individuals [14], [15]. While there is a considerable body of literature on dysphagia difficulties in Parkinson's disease (PD) along with their treatment, there remains a limited number of research that specifically examines the clinical significance of this issue. The severity of the condition is often associated with dysphagia. However, the connections between alterations of swallowing and other factors connected to Parkinson's disease are still unclear [16], [17].

2. Materials and Methods

In the cross-sectional study, 106 samples of Parkinson's disease patients with dysphagia whose ages ranged between 50 and 70 years were recruited. This study identified the main and demographic data for Parkinson's patients, which collect of hospitals in Baghdad - Iraq, during a follow-up period of 8 months. The duration of the study ranged from two years, for a period from February 3, 2022, to November 26, 2023. The demographic criteria determined age, gender, body mass index, smoking status, and ASA classification. Indications or symptoms, comorbidities, time of Parkinson's disease, employment status, and education level of patients.

For more results, these results were classified as parameters specific in levels of severity associated with patients with Parkinson's disease, and where divided into four parts where the first part includes mentality, behavior, and mood, the second part includes activities of daily living, the third part includes motor examination, and the fourth part includes disease complications using the Unified Parkinson's Disease Rating Scale (UPDRS), which is represented as a tool that evaluates and classifies the severity of the disease in Parkinson's patients, ranging from (0 - 176), where the highest scores represent the highest severity of the disease and the lowest scores represent the level of improvement in patients.

Furthermore, our study recorded data on dysphagia scores and scores for Parkinson's disease patients through videofluoroscopy or two fiberoptic endoscopic swallowing

assessment intervention procedures. Also, the outcomes of dysphagia-related complications in Parkinson's patients were determined. Our data assessed the quality of life for patients with Parkinson's disease, where the criteria included the physical aspect, the psychological aspect, the social aspect, and the daily activities aspect. In addition, this study determined the results of a multivariable logistic regression analysis related to dysphagia in Parkinson's disease. All patient outcome methodologies were analyzed and designed by SBS software 22.0.

3. Results

Table 1. Demographic and clinical characteristics outcomes of patients with Parkinson's disease

Characteristics	Number of patients [n = 106]	Percentage [%]
Age		
50 – 54.5	21	19.81%
55 – 59.5	18	16.98%
60 – 64.5	28	26.42%
65 – 70	39	36.79%
Sex		
Male	71	66.98%
Female	35	33.02%
BMI		
< 23.0	30	28.30%
24 – 26	40	37.74%
> 36	36	33.96%
Smoking		
Yes	11	10.38%
No	95	89.62%
ASA (%)		
I	16	15.09%
II	25	23.58%
III	45	42.45%
IV	20	18.87%
Indicators		
Tremor	34	32.08%
Bradykinesia	45	42.45%

Rigidity	14	13.21%
Postural instability	13	12.26%
Comorbidities		
Hypertension	96	90.57%
Diabetes Mellitus	90	84.91
Hypothyroidism	45	42.45
Pneumonia	34	32.08
Kidney disease	78	73.58
PD duration (months)	55.43 ± 34.28	
Occupation		
Unemployed	34	32.08%
Employed	72	67.92%
Education		
Primary school	23	21.7%
Secondary school	30	28.3%
College/university	53	50%

Table 2. Classify the level of severity of Parkinson's disease in patients

Items	Sections	Scores
Part I	Mentation	46
	Behavior	69
	Mood	55
Part II	Activities of daily living	104
Part III	Motor examination	86
Part IV	Complications of disease	98

Table 3. Enroll the clinical outcomes related to grades and scores of dysphagia associated with Parkinson's disease

Parameters	Grades	Scores
Oral motor	Normal	3
	Impaired	2
	Severe impaired	1
Swallowing reaction	Normal	2

	Delayed	1
Soft palate lift function	Normal	3
	Impaired	2
	Severe impaired	1
Hyoid laryngeal complex movement	Intact	3
	Inadequate	2
	None	1
Cricopharyngeal muscle opening duration	Normal	3
	Delayed	2
	Severe delayed	1
Glottic closure	Intact	3
	Inadequate	2
Vallecular residue	<50%	2
	> 50%	1
Pyriform sinus residue	<50%	2
	> 50%	1

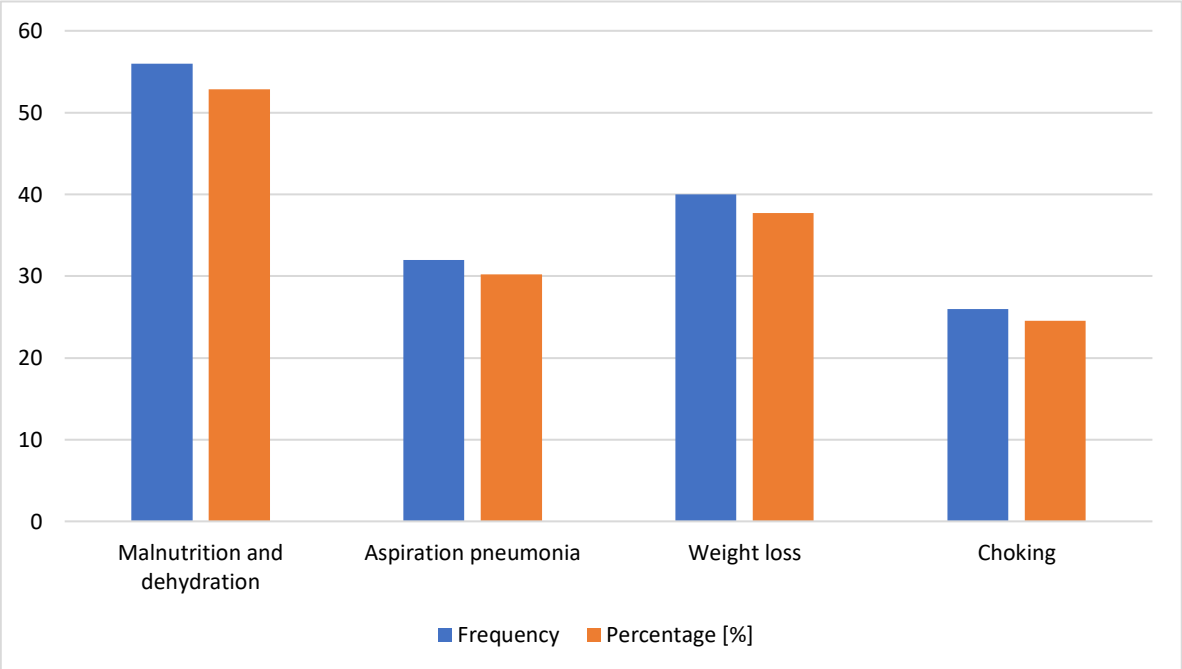

Figure 1. Determine complications outcomes related to dysphagia for patients with Parkinson's disease

Table 4. Assessment of quality of life for patients with Parkinson's disease

Items	**Mean ± SD**

Physical function	53.17 ± 14.25
Psychological function	45.32 ± 7.46
Social function	67.73 ± 8.45
Daily activities	52.14 ± 4.67

Table 5. Identify multivariate logistic regression analysis outcomes related to dysphagia in Parkinson's disease

Parameters	**OR**	**CI 95%**	**P – value**
Sex			
Male	6.04	1.12 ± 10.23	0.023
Female	5.432	1.022 ± 17.19	0.0121
Indicators			
Tremor	0.303	0.0201 ± 0.974	0.0381
Bradykinesia	1.080	0.460 ± 3.651	0.870
Smoking			
Yes	4.520	0.830 ± 20.913	0.077
No	0.459	0.011 ± 6.338	0.0132
Complications			
Malnutrition and dehydration	3.792	1.023 ± 6.053	0.0281
Aspiration pneumonia	2.24	0.55 ± 7.76	0.0120
PD duration	0.950	0.320 ± 0.992	0.012
Dysphagia function			
Swallowing reaction	1.408	0.254 ± 6.508	0.650
Glottic closure	2.442	1.31 ± 8.890	0.065
Vallecular residue	1.132	0.005 ± 3.868	0.0355

4. Discussion

Clinical data showed that patients aged 65–70 were the most frequent category at 36.79%, males were higher at 66.98% than females at 33.02%, body mass indexes < 23.0 were at 28.30%, and 24–26 were 37.74%. 36 was 33.96%, smoking patients were 10.38%, and non-smoking patients were 89.62%. 42.45% of patients were classified as ASA III. Some patients had tremors, which included 34 patients; bradykinesia, which included 45 patients;

and haughtiness, which included 14 patients. Postural stability included 13 patients, and the duration of Parkinson's disease was 55.43 ± 34.28 months.

The results of the Parkinson's disease severity classifications were recorded as follows: disease severity scores were 46, behavior was 69, mood was 55, activities of daily living were 104, motor examination was 86, and disease complications were 98. The results recorded complication rates for Parkinson's patients who suffered from dysphagia, including malnutrition and dehydration, which included 56 patients; aspiration pneumonia, which included 32 patients; weight loss, which included 40 patients; and suffocation, which included 26 patients. Our results recorded data on scores and scores for dysphagia associated with Parkinson's disease, where oral motor included normal with a score of 3, severe with a score of 1, swallowing reflex included with a score of 2, delay was 1, laryngohyoid movement complex with a score of 3, insufficient was a score of 2, glottic closure, which included connected with a score of 3, and insufficient with a score of 2. These patient outcomes data determined that the physical aspect was 53.17 ± 14.25, the psychological aspect was 45.32 ± 7.46, the social aspect was 67.73 ± 8.45, and the daily activities aspect was 52.14 ± 4.67.

Dysphagia, a prevalent and often disregarded manifestation of Parkinson's disease, refers to the difficulty in swallowing [18]. The condition had a negative influence on the health and overall well-being of sufferers, where dysphagia resulted in consequences, which include malnutrition, dehydration, as well as aspiration pneumonia. In addition, it also can result in terms of social seclusion and less pleasure from meals, which leads to weight loss and exacerbating other health issues [19], [20].

Almost all participants were diagnosed with Parkinson's disease, which results in challenges in transporting food from the oral cavity to the esophagus, along with issues related to the synchronization and timing of swallowing motions where symptoms can manifest as an asphyxiation, coughing, and feeling of food being lodged in the esophagus, as well as patients had refrained through determining certain food items or dining in the presence of others, which impact to their social engagements and psychological well [21].

Possible interventions of dysphagia of patients with Parkinson's can cause dietary adjustments, oropharyngeal exercises, speech pathology, and, in some instances, the use of enteral feeding tubes where regular assessment and monitoring of swallowing function in people with Parkinson's disease by healthcare practitioners can show as a basic to remove problems and enhance quality of life [22].

5. Conclusion

Dysphagia can have a substantial influence on patients with Parkinson's disease, which allows them to compromise their physical well-being, mental health, and social engagements. Timely identification and proper treatment of dysphagia are essential in maintaining the general health of patients diagnosed with Parkinson's disease.

REFERENCES

[1] G. Çamcı and S. Oğuz, "Association between Parkinson's disease and Helicobacter pylori," *J Clin Neurol*, 2016, [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4828559/

[2] T. Pringsheim, N. Jette, A. Frolkis, and ..., "The prevalence of Parkinson's disease: a systematic review and meta-analysis," *Movement …*, 2014, doi: 10.1002/mds.25945.

[3] I. Suttrup and T. Warnecke, "Dysphagia in Parkinson's disease," *Dysphagia*, 2016, doi: 10.1007/s00455-015-9671-9.

[4] K. F. Luchesi, I. P. De Toledo, and L. F. Mourao, "Dysphagia in Parkinson's disease: prevalence, impact and management challenges," *J Otolaryngol ENT Res*, 2017, [Online]. Available: https://www.researchgate.net/profile/Lucia-Mourao-2/publication/316589325_Dysphagia_in_Parkinson's_disease_Prevalence_Impact_and_Management_Challenge

s/links/5925ed570f7e9b9979903f74/Dysphagia-in-Parkinsons-disease-Prevalence-Impact-and-Management-Challenges.pdf

[5] R. López-Liria, J. Parra-Egeda, and ..., "Treatment of dysphagia in Parkinson's disease: a systematic review," *International journal of …*, 2020, [Online]. Available: https://www.mdpi.com/1660-4601/17/11/4104

[6] J. Benito-Leon, "Epidemiology of Parkinson's disease in Spain and its contextualisation in the world," *Rev Neurol*, 2018, [Online]. Available: https://europepmc.org/article/med/29435969

[7] J. A. Simons, U. M. Fietzek, A. Waldmann, and ..., "Development and validation of a new screening questionnaire for dysphagia in early stages of Parkinson's disease," *Parkinsonism &related …*, 2014, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S1353802014002284

[8] J. P. Sutton, "Dysphagia in Parkinson's disease is responsive to levodopa," *Parkinsonism &related disorders*, 2013, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S1353802012004403

[9] K. R. Chaudhuri, D. G. Healy, and A. H. V Schapira, "Non-motor symptoms of Parkinson's disease: diagnosis and management," *Lancet Neurol*, 2006, [Online]. Available: https://www.thelancet.com/journals/laneur/article/PIIS1474442206703738/fulltext

[10] J. Jankovic, "Parkinson's disease: clinical features and diagnosis," *Journal of neurology, neurosurgery &psychiatry*, 2008, [Online]. Available: https://jnnp.bmj.com/content/79/4/368.short

[11] T. Warnecke, C. Hamacher, S. Oelenberg, and ..., "Off and on state assessment of swallowing function in Parkinson's disease," *… & related disorders*, 2014, [Online]. Available: https://www.prd-journal.com/article/S1353-8020(14)00236-3/abstract

[12] M. Prosiegel, "Neurogene Dysphagien," *Nervenarzt*, 2007, doi: 10.1007/s00115-007-2337-6.

[13] B. J. Heijnen, R. Speyer, L. W. J. Baijens, and H. C. A. Bogaardt, "Neuromuscular electrical stimulation versus traditional therapy in patients with Parkinson's disease and oropharyngeal dysphagia: effects on quality of life," *Dysphagia*, 2012, doi: 10.1007/s00455-011-9371-z.

[14] Y. Manor, R. Mootanah, D. Freud, N. Giladi, and ..., "Video-assisted swallowing therapy for patients with Parkinson's disease," *Parkinsonism &related …*, 2013, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S135380201200380X

[15] R. P. Athukorala, R. D. Jones, O. Sella, and ..., "Skill training for swallowing rehabilitation in patients with Parkinson's disease," *Archives of physical …*, 2014, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S000399931400183X

[16] K. F. Luchesi, S. Kitamura, and L. F. Mourão, "Dysphagia progression and swallowing management in Parkinson's disease: an observational study," *Brazilian Journal of …*, 2015, [Online]. Available: https://www.scielo.br/j/bjorl/a/RR6QQ87H45zwLBJc5SRL6SP

[17] S. E. Langmore, "Evaluation of oropharyngeal dysphagia: which diagnostic tool is superior?," *Current opinion in otolaryngology &head and …*, 2003, [Online]. Available: https://journals.lww.com/co-otolaryngology/fulltext/2003/12000/Evaluation_of_oropharyngeal_dysphagia__which.14.aspx

[18] A. Lim, L. P. Leow, M. L. Huckabee, C. Frampton, and ..., "A pilot study of respiration and swallowing integration in Parkinson's disease:'on' and 'off' levodopa," *Dysphagia*, 2008, doi: 10.1007/s00455-007-9100-9.

[19] M. Hirano, C. Isono, H. Sakamoto, S. Ueno, S. Kusunoki, and ..., "Rotigotine transdermal patch improves swallowing in dysphagic patients with Parkinson's disease," *Dysphagia*, 2015, doi: 10.1007/s00455-015-9622-5.

[20] C. G. Goetz, B. C. Tilley, S. R. Shaftman, and ..., "Movement Disorder Society-sponsored revision of the Unified Parkinson's Disease Rating Scale (MDS-UPDRS): scale presentation and clinimetric testing results," *… : official journal of the …*, 2008, doi: 10.1002/MDS.22340.

[21] C. G. Goetz, W. Poewe, O. Rascol, C. Sampaio, and ..., "Movement Disorder Society Task Force report on the Hoehn and Yahr staging scale: Status and recommendations The Movement Disorder Society Task Force on …," *Movement …*, 2004, doi: 10.1002/mds.20213.

[22] J. R. Aguiar, R. Carneiro, I. Carneiro, L. Magalhães, and ..., "A Prevalence of Dysphagia in Patients Admitted to a Department of Internal Medicine and Intensive and Intermediate Care Unit: Results of a Pilot Study.," *Medicina …*, 2023, [Online]. Available: https://revista.spmi.pt/index.php/rpmi/article/view/929

[23] I. Suttrup, S. Oelenberg, C. Hamacher, R. Dziewas, and ..., "Endoscopic L-dopa-test for parkinsonian dysphagia (a pilot study)," *Dysphagia*, 2011.

[24] K. Lam, F. K. Y. Lam, K. K. Lau, and ..., "Simple clinical tests may predict severe oropharyngeal dysphagia in Parkinson's disease," *Movement …*, 2007, doi: 10.1002/mds.21362.

[25] Y. Manor, N. Giladi, A. Cohen, D. M. Fliss, and ..., "Validation of a swallowing disturbance questionnaire for detecting dysphagia in patients with Parkinson's disease," *Movement …*, 2007, doi: 10.1002/mds.21625.

[26] S. Yuan, "Epidemiology of sarcopenia: Prevalence, risk factors, and consequences," *Metabolism*, vol. 144, 2023, doi: 10.1016/j.metabol.2023.155533.

[27] D. Wu, "The blood–brain barrier: structure, regulation, and drug delivery," *Signal Transduct Target Ther*, vol. 8, no. 1, 2023, doi: 10.1038/s41392-023-01481-w.

[28] A. N. Brandebura, "Astrocyte contribution to dysfunction, risk and progression in neurodegenerative disorders," *Nat Rev Neurosci*, vol. 24, no. 1, pp. 23–39, 2023, doi: 10.1038/s41583-022-00641-1.

[29] Y. Xu, "Acetylation in the regulation of autophagy," *Autophagy*, vol. 19, no. 2, pp. 379–387, 2023, doi: 10.1080/15548627.2022.2062112.

[30] A. Siderowf, "Assessment of heterogeneity among participants in the Parkinson's Progression Markers Initiative cohort using α-synuclein seed amplification: a cross-sectional study," *Lancet Neurol*, vol. 22, no. 5, pp. 407–417, 2023, doi: 10.1016/S1474-4422(23)00109-6.