

Identifying Frequency of Dementia in Parkinson's Disease

Abdul Malik¹, Bushra Ammad Taimuri¹, Shabana Saeed², Sadaf Shaheen⁴, Kamal Ahmed¹ and Muhammad Athar Khan³

ABSTRACT

Objective: The objective of the study was to determine the frequency and characteristics of dementia in Parkinson's disease.

Study Design: A descriptive / cross sectional study

Place and Duration of Study: This study was conducted at the Department of Medicine, Liaquat College of Medicine & Dentistry and Neuro Clinic & Falij Care, Karachi from October 2018 to March 2019.

Materials and Methods: This study was conducted on 35 patients presenting with memory impairment at the obtaining ethical approval from IRB-Liaquat College of Medicine and Dentistry. Adult patients of more than 18 years of age presenting with multiple cognitive deficits with a score of 23 or less out of 30 on Folstein mini-mental state examination were included in the study. The results were tabulated and analyzed using SPSS-21.

Results: A sample of 35 cases (23 males and 12 females) with PD was included. The mean age of patients was 57.4 ± 13.9 years and range between 40-85 years. Out of 35 cases six (17.1%) had PD with dementia (PDD); while 29 (82.85%) out of 35 were non-demented. Out of six demented patient's five (83%) were males and one (17%) was female. The average values of outcome of different variables were: Time Orientation 3.1 ± 1.8, Registration 1.7 ± 1.3, Attention and Calculation 1.4 ± 1.7, Recall 1.4 ± 1.4, and Language 4.5 ± 3.2. The average score of Mini Mental Score Examination was 15.3 ± 10.36.

Conclusion: In conclusion, this study revealed that the frequency of developing dementia in PD was less than one third in study sample.

Key Words: Dementia, Parkinson's disease, Prevalence, Non-motor symptoms, Parkinson's disease dementia, Cognition

Citation of article: Malik A, Taimuri BA, Saeed S, Shaheen S, Ahmed K, Khan MA. Identifying Frequency of Dementia in Parkinson's Disease. Med Forum 2021;32(6):125-128.

INTRODUCTION

Dementia is a general term that illustrates the cognitive decline in brain function. There are numerous causes for this condition like Alzheimer's disease, vascular dementia, Parkinson disease, Huntington disease etc.¹ Parkinson's disease (PD) is a neurological ailment that manifests itself in a variety of ways. Non-motor symptoms (e.g. cognitive impairment, sleep difficulties, depression, and hallucinations) are now commonly recognized as part of the clinical spectrum, in addition to the traditional motor aspects (i.e. tremor, rigidity, bradykinesia, and postural instability).²

¹. Department of Medicine / Biochemistry² / Community Medicine³, Liaquat College of Medicine & Dentistry, Karachi.

⁴. Department of Anatomy, Lyari Medical College, Karachi.

Correspondence: Dr. Muhammad Athar Khan, Professor of Community Medicine, Liaquat College of Medicine and Dentistry, Karachi.

Contact No: 0323-2135932

Email: matharm@yahoo.com

Received: January, 2021

Accepted: February, 2021

Printed: June, 2021

Parkinson's disease (PD) is characterized by a clinical triad of bradykinesia (slowness of movement), rigidity (stiffness), and localized tremor, which can occur even while the patient is at rest. Aside from these key symptoms, PD has a wide range of clinical manifestations.³

Parkinson's disease is the second most common cause of age-related neurodegeneration. It is estimated that 10 million people worldwide suffer with Parkinson's disease.⁴ The reported prevalence of Parkinson's disease (PD) in different parts of the world varies considerably.⁵ About 450,000 people in Pakistan suffer from PD in a population of about 182 million that accounts about 219 individuals with PD in every 100,000 individuals. Recently, reported that more than 600,000 people are living with PD in Pakistan.⁶

Specifically, the presence of dementia in (PD) is perhaps the main non-motor symptom, particularly in further advance illnesses.² From early to late stages of the disease, up to 90% of PD patients report non-motor symptoms (NMS). Mukhtar S et al. reported that NMS is very common in PD in our population. Compared with men, certain NMS are more common in women. Autonomous diseases such as constipation (56%), nocturia (49%) and memory problems (45%) are the most common NMS, while 35% of patients report urgency.^{7,8} It is worth noting that this decline in

cognitive capabilities is related to the increase in mortality, the hindrance of prosperity, the burden of the number of parents, and the increase in clinical considerations and supervision costs.⁹ Therefore, due to the huge impact, the risk of PD dementia is usually an important point for patients and their families.

Information about which patients will eventually develop dementia may be useful for the patient, caregiver and physicians to plan future treatment. The key to dealing with these patients' cognitive deterioration, however, is early detection. The non-motor symptoms are also considered to be a problem of severe disease and thus routinely ignored in early disease by practicing physicians. There is a scarcity of literature in Pakistan on many aspects of dementia. The impact of this condition has been underestimated due to a lack of awareness and inadequate study.¹

MATERIALS AND METHODS

A cross sectional study was conducted on 35 patients presenting with memory impairment at the Department of Medicine, Liaquat College of Medicine & Dentistry and Neuro Clinic & Falij Care, Karachi from October 2018-March 2019 after obtaining ethical approval from IRB-Liaquat College of Medicine and Dentistry. Adult patients of more than 18 years of age presenting with multiple cognitive deficits with a score of 23 or less out of 30 on Folstein mini-mental state examination were included in the study. Informed consent was given by the next of kin. Patients with acute delirious state, electrolyte abnormalities of hyponatremia and hypernatremia, hypoglycemia or hyperglycemia, hepatic encephalopathy, uremic encephalopathy were excluded.

After addressing the ethical issues (consent, confidentiality) all patients enrolled in the study were undergo a detailed history including history of presenting illness, past history, family history drug history and through physical and neurological examination on a Performa. The results were tabulated and analyzed using SPSS-21 (Statistical package for social sciences version 21). Discrete variables like gender, impaired of memory, impairment of other cognitive domains, past history of diseases, motor examination, planters, etc. were expressed by frequencies & percentages whereas age, pulse, blood pressure, laboratory investigations & MMSE were presented in Mean ± SD.

RESULTS

A total of 35 people with Parkinson's disease were chosen, comprising 23 men and 12 women. The mean age of patients was 57.4 ± 13.9 years and range between 40-85 years (Table-1). Six (17.1%) of the 35 individuals had PD with dementia (PDD), while the remaining 29 (82.85%) were non-demented. (Figure-1).

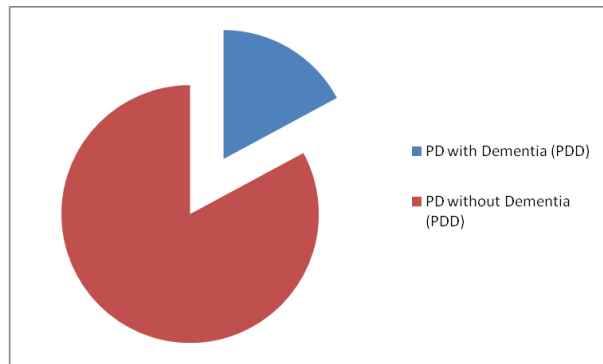


Figure No.1: Parkinson Disease (PD) with Dementia & without Dementia

Table No.1: Baseline Characteristics of Study Participants

Variable	N	%
Impairment of Other Cognitive Domain		
Onset of Symptoms		
Acute	13	37.1
Insidious	22	62.9
Progression of Symptoms		
Yes	17	48.6
No	18	51.2
Past History - DM		
Yes	09	25.7
No	26	74.3
Past History - HTN		
Yes	12	34.3
No	23	65.7
Past History - Smoking		
Yes	06	17.1
No	29	82.9
Past History - Alcohol & Other Substances Abuse		
Yes	05	14.3
No	30	85.7
Past History - Cerebrovascular Disease		
Yes	16	45.7
No	19	54.3
Family History of Dementia		
Yes	05	14.3
No	30	85.7
Gait		
Normal	19	54.3
Abnormal	16	45.7

Five (83%) of the six demented patients were males, whereas one (17%) was female (Figure-2). On the basis of the existence or absence of dementia features among the patients, we separated the sample into two groups. The majority of those with PDD developed dementia symptoms after the sixth decade. Four (64%) of the six people with dementia were between the ages of 61 and 75, while the remaining two (36%) were over 75, indicating that older people with PD have higher

memory impairment than younger people. When compared to Parkinson's disease patients with dementia, the duration of Parkinson's disease was fewer than 10 years in all non-demented patients. The average values of outcome of different variables were: Time Orientation 3.1 ± 1.8 , Registration 1.7 ± 1.3 , Attention and Calculation 1.4 ± 1.7 , Recall 1.4 ± 1.4 , and Language 4.5 ± 3.2 . The average score of Mini Mental Score Examination was 15.3 ± 10.36 .

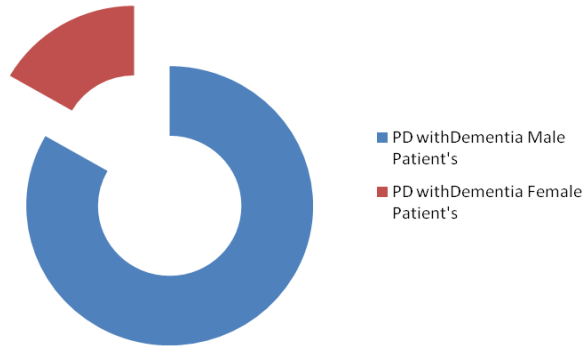


Figure No.2: Parkinson Disease (PD) with Dementia- Gender Ratio

Table No.2: Impairment of Other Cognitive Domain of Study Participants

Variable	n	%
Language		
Yes	25	71.4
No	10	28.6
Motor Activities		
Yes	26	74.3
No	09	25.7
Sleep		
Yes	22	62.9
No	13	37.1
Behaviour		
Yes	21	60
No	14	40
Incontinence		
Yes	12	34.3
No	23	65.7
Activity of Daily Living		
Yes	32	91.4
No	03	8.6

DISCUSSION

Compared with developing countries (4-5%), the burden of neurological diseases in developed countries (10-11%) is higher, and the overall burden of neurological diseases in the world is about 6.5%. Neurological illnesses are a leading cause of death and disability, with stroke, dementia, migraine, epilepsy, and triple tetanus being the most common. Like developed countries, the incidence of neurological illnesses is rising in developing countries due to a variety of causes including urbanization, higher life

expectancy, lifestyle changes, and improved diagnostic facilities.¹⁰

Patients with idiopathic Parkinson's disease, with an average age of 57 years, were included in this study. We found that almost 17% of the study participants with PD developed dementia. LMICs are home to 58 percent of the dementia population, which is expected to increase to 71 percent by 2050. In Pakistan, there have been no population-based reports on dementia prevalence.^{11,12} The pathophysiology of dementia in PD comes out to be of a various factors, include sub cortical and cortical neuronal populations. Our observation reveals that the patients with dementia having PD who had an early onset of symptoms (age > 60 years) showed lower score of the mini mental score examination (MMSE). There was a significant difference in MMSE scores between patients with PD who were younger than 60 years old. The Sydney multi-center study represents the main extensive natural history study to track the most recently diagnosed PD patients (with a normal time of beginning of roughly 60 years) and the clinical history of the next 20 years. Based on the evaluation data 10-13 of these patients at 5, 10, 15 and 20 years, the authors report that at the time of the final review (approximately 80 years old), 25 of the remaining 30 patients (83%) The initial research has developed into dementia.^{13,14} The MMSE scores of patients with Parkinson's disease who were younger than 60 years old differed significantly.¹⁵, while in our study keeping in view that our number of participants are not comparable to the Indian study but had late onset of dementia among the Parkinson's patients, with the mean age of patients was 57.4 ± 13.9 years.

In this study, patients with PD who also had dementia had a more pronounced functional decline and worse clinical state than those who did not have dementia. A difference was also found between the happening of dementia and motor conciliation in patients with PD, this finding is comparable to the study previously reported from the Indian population¹⁵. The finding that dementia happens all the more commonly in patients with progressive movement disorders is consistent with past work.^{16,17} We found 05 out 35 patients had a family history of dementia. Supplementary family data from Australian cohort showed that only 4 of the 18 patients had PD family background, and 3 of them did not progress dementia.¹⁸ More than half of patients report cognitive impairment. A 16-year outcome evaluation report of the Denbighshire cohort stated that Parkinson's disease has mild cognitive impairment and is an important predictor of PDD progression.¹⁹ Burn and Alves found that the PIGD motor subtype is associated with a faster rate of cognitive decline in PD and may be considered a risk factor for incident dementia in PD.^{20,21}

CONCLUSION

In conclusion, this study revealed that the frequency of developing dementia in PD was less than one third in study sample. This study also found a significant number of males developed the dementia in PD as compared to females.

Author's Contribution:

Concept & Design of Study: Abdul Malik
 Drafting: Bushra Ammad Taimuri, Shabana Saeed
 Data Analysis: Sadaf Shaheen, Kamal Ahmed, Muhammad Athar Khan
 Revisiting Critically: Abdul Malik, Bushra Ammad Taimuri
 Final Approval of version: Abdul Malik

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Seetlani NK, Kumar N, Imran K, Ali A, Shams N, Sheikh T. Alzheimer and vascular dementia in the elderly patients. *Pak J Med Sci* 2016;32(5): 1286-90.
2. Szeto JYY, Walton CC, Rizos A, Martin PM, Halliday GM, Naismith SL, et al. Dementia in long-term Parkinson's disease patients: a multicenter retrospective study. *NPJ Parkinsons Dis* 2020;6(2).
3. Taimur M, Shah M, Ali M, Barry HD, Hussain SZM, Shahzad H, et al. Frequency of Cognitive Impairment in Patients with Parkinson's Disease. *Cureus* 2019;11(5): e4733.
4. Parkinson's Disease Statistics. Accessed: May 03, 2020: <https://parkinsonsnewstoday.com/parkinsons-disease-statistics/>.
5. Khan S, Nabi G, Naeem M, Ali L, Silburn PA, Mellick GD. A door-to-door survey to estimate the prevalence of Parkinsonism in Pakistan. *Neuropsychiatr Dis Treat* 2016;12:1499–1506.
6. Hussain G, Rasul A, Anwar H, Sohail MU, Kamran SKS, Baig SM, et al. Epidemiological Data of Neurological Disorders in Pakistan and Neighboring Countries: A Review. *PJNS* 2017;12(4):52-70.
7. Khoo TK, Yarnall AJ, Duncan GW, Coleman S, O'Brien JT, Brooks DJ, Barker RA, Burn DJ. The spectrum of nonmotor symptoms in early Parkinson disease. *Neurol* 2013;80(3):276-81.
8. Mukhtar S, Imran R, Zaheer M, Tariq H. Frequency of non-motor symptoms in Parkinson's disease presenting to tertiary care centre in Pakistan: an observational, cross-sectional study. *BMJ Open* 2018;8(5):e019172.
9. Vossius C, Larsen JP, Janvin C, Aarsland D. The economic impact of cognitive impairment in Parkinson's disease. *Mov Disord* 2011;26:1541-44.
10. Ahmad A, Ashraf S, Mehboob R. Current Status of Neurology and Neuroscience Research in Pakistan. *Annals KEMU* 2017;23(3):408-13.
11. Hanagasi HA, Tufekcioglu Z, Emre M. Dementia in Parkinson's disease. *J Neurol Sci* 2017;374: 26–31.
12. Shafqat S. Alzheimer Disease Therapeutics: Perspectives from the Developing World. *Journal of Alzheimer's Dis* 2008;15(2):285–287.
13. Hely MA, Reid WG, Adena MA, Halliday GM, Morris JG. The Sydney multicenter study of Parkinson's disease: the inevitability of dementia at 20 years. *Mov Disord* 2008;23:837–844.
14. Hely MA, Morris JG, Reid WG, Trafficante R. Sydney Multicenter Study of Parkinson's disease: non-L-dopa-responsive problems dominate at 15 years. *Mov Disord* 2005;20:190–199
15. Dementia and Cognitive Impairment in Patients With Parkinson's Disease From India: A 7-Year Prospective Study. *Jaya Sanyal, Tapas Kumar Banerjee, et al; American Journal of Alzheimer's Disease & Other Dementias* ® 2014;29(7):630-636.
16. Braak H, Rüb U, Steur EJ, Del Tredici K, De Vos RAI. Cognitive status correlates with neuropathologic stage in Parkinson disease. *Neurol* 2005;64:1404–1410
17. Levy G, et al. Motor impairment in PD relationship to incident dementia and age. *Neurol* 2000;55: 539–544.
18. Farrer MJ. Genetics of Parkinson disease: paradigm shifts and future prospects. *Nat Rev Genet* 2006;7:306.
19. Hobson P, Meara J. Mild cognitive impairment in Parkinson's disease and its progression onto dementia: a 16-year outcome evaluation of the Denbighshire cohort. *Int J Geriatr Psychiatr* 2015; 30(10):1048-55.
20. Burn DJ, et al. Motor subtype and cognitive decline in Parkinson's disease, Parkinson's disease with dementia, and dementia with Lewy bodies. *J Neurol Neurosurg Psychiatr* 2006;77:585–589.
21. Alves G, Larsen JP, Emre M, Wentzel-Larsen T, Aarsland D. Changes in motor subtype and risk for incident dementia in Parkinson's disease. *Mov Disord* 2006;21:1123–1130.