PARKINSONISM AND ITS CLINICAL SUBTYPES - AN OBSERVATIONAL STUDY IN A TERTIARY CARE HOSPITAL, A.P.

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Abstract:

This study is a hospital based Observational study to understand the prevalence and rank order of subtypes of Parkinsonism. **Material and Method:** Subjects are enrolled after written and informed consent. Details were recorded in a predesigned proforma after detailed history and clinical examination. If the patient was found to have akinetic rigid state/features of Parkinsonism, detailed history relevant to various Parkinsonian syndromes were taken to know the kind of Parkinsonian syndrome he/she belongs to. Standard criteria of each of the Parkinsonian syndromes are applied to confirm about the type of Parkinsonian syndrome the patient is suffering with. Data entered and analysed in Microsoft Excel 2007 and presented in the form of frequencies and percentages. **Observations:** The prevalence of Parkinsonism in this study is 42 per 10000 population. The different types of Parkinsonism in the order high to low are Idiopathic Parkinson's Disease (62.50%), Progressive Supranuclear Palsy (16.67%), Vascular Parkinsons Disease (12.50%), Multi System Atrophy (3.33%), Cortico-Basal Degeneration (2.50%), Drug induced Parkinsons Disease (1.67%) and Dementia with Lewy Bodies (0.83%). **Conclusions:** A total of 120 patients were found to have features of Parkinsonism out of 28800 patients. The prevalence of Parkinsonism in this study is 42 per 10000 population.

KEYWORDS: Parkinsonism, Sub-types of Parkinsonism, Prevalence, Rank order

Introduction: Parkinson's disease was first medically described as a neurological syndrome by James Parkinson in 1817[1]. The term *Parkinsonism* is defined by any combination of six specific motor features: tremors at rest, bradykinesia, rigidity, loss of postural reflexes, flexed posture, and the freezing phenomenon (where the feet are transiently "glued to the ground"). Not all six of these cardinal features need be present, but at least two should be before the diagnosis of Parkinsonism is made, with at least one of them being tremors at rest or bradykinesia[2].

At present Parkinsonism is sub classified into Idiopathic Parkinson's disease, secondary Parkinsonism, Parkinsonism Plus syndromes and Heridodegenerative Parkinsonism[3]. Commonly diagnosed clinical types of Parkinsonism includes Idiopathic Parkinson's disease, progressive supranuclear palsy (PSP), Multi system Atrophy (MSA), Corticobasal degeneration (CBD) and Vascular Parkinsonism(VPD)[4].

There are many studies done to look for prevalence of idiopathic Parkinson's disease in India

and abroad, but there are very limited number of studies that looked at various subtypes of Parkinsonism, and few studies that are available also are community based. This study is a hospital based Observational study to understand the prevalence of subtypes of Parkinsonism (which includes Idiopathic Parkinson's disease, various Parkinsonism plus syndromes and Vascular Parkinsonism) in a hospital setup including both inpatient and outpatient population.

Material and Method:

Study design: Hospital based Observational study

Study period: January 2017 to December 2018

Inclusion criteria: Patients who present to both in-patient and out-patient departments with Parkinsonism/Akinetic rigid state

Exclusion criteria: (1) Those who does not fulfill the cardinal features of Parkinsonism. (2) Parkinsonism patients who are terminally ill due to other co-morbid condition. (3) Patients with movement disorders other than Parkinsonism.

Study procedure: Subjects are enrolled after written and informed consent. Details were recorded in a predesigned proforma after detailed history and clinical examination. If the patient was found to have akinetic rigid state/features of Parkinsonism, detailed history relevant to various Parkinsonian syndromes were taken to know the kind of Parkinsonian syndrome he/she belongs to. Standard criteria of each of the Parkinsonian syndromes are applied to confirm about the type of Parkinsonian syndrome the patient is suffering with.

Data analysis: Data entered and analysed in Microsoft Excel 2007 and presented in the form of frequencies and percentages.

Observations:

A total number of 28,800 patients were attended to the Department of Neurology from January 2017 to December 2018. After thorough history taking and detailed clinical examination and applying inclusion and exclusion criteria, a total of 120 patients were found to have features of Parkinsonism and Akinetic rigid syndrome. The prevalence of **Parkinsonism** in this study is 42 per 10000 population.

Among the participants diagnosed Parkinsonism, 100 are males and 20 are females (Fig-1)

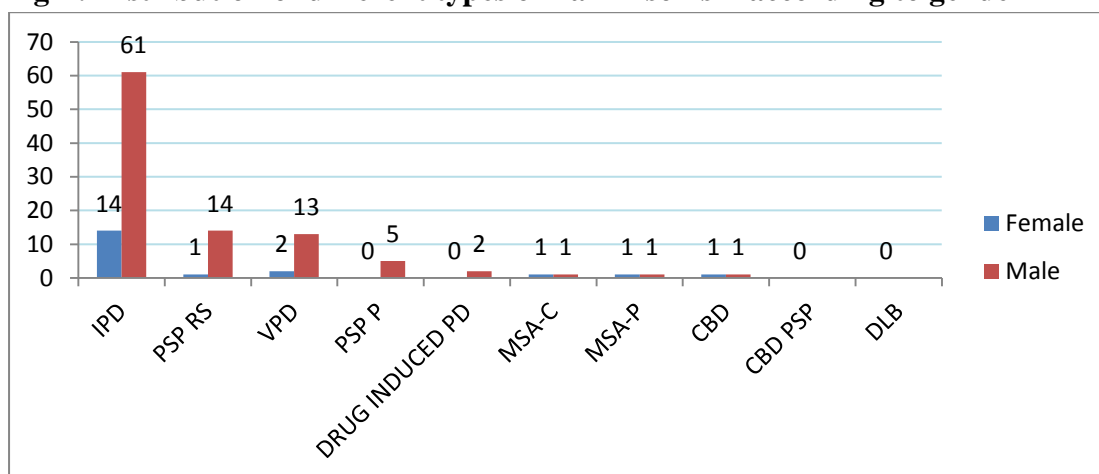**Fig-1: Distribution of different types of Parkinsonism according to gender**

Table-1: Parkinsonism Subtypes

DIAGNOSIS	NUMBER	Percentage (%)
IPD	75	62.50
VPD	15	12.50
PSP RS	15	12.50
PSP P	5	4.17
DRUG INDUCED PD	2	1.67
MSA-C	2	1.67
MSA-P	2	1.67
CBD	2	1.7
CBD PSP	1	0.83
DLB	1	0.83
Grand Total	**120**	**100.00**

Rank order of different types of Parkinsonism in the present study in the decreasing order is Idiopathic Parkinson's Disease(IPD), Vascular Parkinsonism, Progressive Supranuclear Palsy(PSP), Multiple System Atrophy(MSA), Cortico Basal Degeneration(CBD), Drug Induced Parkinsonism and Dementia with Lewy Bodies(DLB). Among the 120 patients, as per United Kingdom Parkinson's disease society Brain Bank Diagnostic criteria[5], a total of 75 Patients were diagnosed to have Idiopathic Parkinsons disease. The prevalence of **Idiopathic Parkinsons disease** in this study is 26/10,000 population. Idiopathic Parkinsons disease top ranks among patients with Parkinsonism 62.5% (Table-2).

The prevalence of **Vascular Parkinsonism** is 5/10000 population in this study. As per Zilman et al criteria[7], diagnosis of Vascular Parkinsonism was made in 15 cases with 12.5% among all subtypes.

The prevalence of **Progressive Supranuclear Palsy** in this study is 7/10000 population. 20 cases of Progressive supra nuclear palsy were diagnosed as per NINDS criteria[6]. Progressive supra nuclear Palsy constituted 16.66% (20 of 120) of which **PSP RS** was 12.5% (n=15), **PSP P** was 4.17% (n=5).

Prevalence of **Multi system atrophy** in this study is 1/10000 population. As per second consensus criteria[8] 4 cases were diagnosed with 3.34% among Parkinsonism subtypes, of which **MSA P** with 1.67% (n=2) and **MSA C** with 1.67% (n=2).

Prevalence of **Cortico basal Degeneration** in this study is 1/10000 population. As per Armstrong criteria[9], 3 cases of CBD were diagnosed 2.5%(n=3) of which **CBD** 1.87% (n=2),**CBD PSP** 0.83% (n=1)

The prevalence of **Drug induced Parkinsonism** is 0.6/10000 population. 2 cases of drug induced PD were diagnosed 1.67% (n=2).

The prevalence of **Dementia with Lewy bodies** is 0.3/10000. 1 case was diagnosed with 0.83% of cases of Parkinsonism.

Discussion:

This is a Hospital based observational study conducted in the Department of Neurology at Narayana Medical College, Nellore for a period of 24 months from January 2017 to December 2018. There are few studies in India which were done to know the epidemiology of Parkinsonism. Most of them are community based.

The prevalence of Parkinsonism in this study is 42 per 10000 population which is similarto that seen in SK das et al study[10] with same the prevalence is 42 per 10000, but more than that in Hamdyn el tallawy et al study with 31.65 per 10,000.

IPD is 62.5% of all the types which is lower than that of SK Das et al study (78.85%), Mona Ragotham[11] et al study (78.85%) and Eman M. Khedr et al study (79.54%), but more than that in J Benito Leon study (44.1%). In Hamdyn el tallawy et al study[12], 33 (67.3%) were Parkinsons disease. PSP in the present study is 16.7% which is more than that in Mona Ragotham et al study (0.8%) and Vanessa Fleury et al study[13] (3.9%). CBD in the present study is 1.67% whereas it is 4.54% in Eman M. Khedr et al study[14]. MSA in the present study is 3.33% whereas it is 0.8% in Mona Ragotham et al study and 1.9% in Vanessa Fleury et al study. DLB was diagnosed in one participant (0.83%) which is less compared to Vanessa Fleury et al study (9%). Drug induced PD is 1.67% in the present study whereas it is 0.8% in Mona Ragotham et al study, 43.4% in Vanessa Fleury et al study, 32.3% in J Benito Leon study [15] and 6.82% in Eman M. Khedr et all study. Vascular PD is 12.5% in the present study which is more than that in lower body Parkinsonism in Eman M. Khedr et all study (4.55%) and J Benito Leon study (4.4%) and less than that in Vanessa Fleury et al study vascular Parkinsonism (37%)

CONCLUSIONS

In this hospital based observational study, a total of 120 patients were found to have features of Parkinsonism out of 28800 patients. The prevalence of Parkinsonism in this study is 42 per 10000 population. Among which as per United Kingdom Parkinsons Disease Society Brain Bank criteria, a total of 75 Patients were diagnosed to have Idiopathic Parkinsons disease. The prevalence of idiopathic Parkinsons disease in this study is 26/10,000 population. Idiopathic Parkinsons disease top ranks among patients with Parkinsonism (62.5%). The prevalence of Progressive supra nuclear palsy in this study is 7/10000 population. 20 cases of Progressive supra nuclear palsy were diagnosed as per NINDS criteria (16.66%). The prevalence of Vascular Parkinsonism is 5/10000 population in this study, as per Zilman et al criteria (12.5%). As per second consensus criteria 4(3.34%) cases were diagnosed among Parkinsonism subtypes of which MSA P is 1.67% (n=2) and MSA C is 1.67% (n=20). Prevalence of Cortico basal Degeneration in this study is 1/10000 population as per Armstrong criteria (2.5%) of which CBD is 1.87% (n=2) and CBD PSP is 0.83% (n=1). The prevalence of Drug induced Parkinsonism is 0.6/10000 population which is 1.67% among all subtypes. The prevalence of Dementia with Lewy bodies is 0.3/10000 (0.83%).

Conflict of Interest: None

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References:

1. Goetz CG. The history of Parkinson's disease: early clinical descriptions and neurological therapies. Cold Spring Harbor perspectives in medicine. 2011;1(1):a008862.

2. Joseph J, John CM, Scott LP and Nancy JN. Bradley and Daroff's Neurology in Clinical Practice 8th edition. 2022.

3. Fahn S. Description of Parkinson's disease as a clinical syndrome. Annals of the New York Academy of Sciences. 2003;991:1-14.

4. Williams DR, Litvan I. Parkinsonian Syndromes. Continuum : Lifelong Learning in Neurology. 2013;19(5 Movement Disorders):1189-212.

5. Hughes AJ, Daniel SE, Kilford L, Lees AJ. Accuracy of clinical diagnosis of idiopathic Parkinson's disease. A clinico-pathological study of 100 cases. JNNP 1992;55:181-184.

6. Litvan I, Hauw JJ, Bartko JJ, Lantos PL, Daniel SE, Horoupian DS, et al. Validity and Reliability of the Preliminary NINDS Neuropathologic Criteria for Progressive Supranuclear Palsy and Related Disorders. J Neuropathol Exp Neurol 1996;55(1):97Y105.

7. Zijlmans JC, Daniel SE, Hughes AJ, Révész T, Lees AJ. Clinicopathological investigation of vascular parkinsonism, including clinical criteria for diagnosis. Mov Disord. 2004;19:630–40.

8. Gilman S, Wenning GK, Low PA, Brooks DJ, Mathias CJ, Trojanowski JQ, et al. Second consensus statement on the diagnosis of multiple system atrophy. National Library of Medicine. 2008 Aug 26;71(9):670-6. (doi: 10.1212/01.wnl.0000324625.00404.15).

9. Armstrong MJ, Litvan I, Lang AE, Bak TH, Bhatia KP, Borroni B, et al. Criteria for the diagnosis of corticobasal degeneration. Neurology. 2013;80(5):496-503.

10. Das SK, Misra AK, Ray BK, Hazra A, Ghosal MK, Chaudhuri A, et al. Epidemiology of Parkinson disease in the city of Kolkata, India: a community-based study. Neurology. 2010;75(15):1362-9

11. Muthane UB, Ragothaman M, Gururaj G. Epidemiology of Parkinson's disease and movement disorders in India: problems and possibilities. The Journal of the Association of Physicians of India. 2007;55:719-24.

12. Tallawy H, Farghaly WM, Shehata GA, Rageh TA, Hakeem NM, Hamed MA, et.al Prevalence of Parkinson's Disease and other types of Parkinsonism in Al Kharga district, Egypt. Neuropsychiatr Dis Treat. 2013;9:1821-1826.

13. Fleury V, Brindel P, Nicastro N, Burkhard PR. Descriptive epidemiology of Parkinsonism in the Canton of Geneva, Switzerland. Parkinsonism Relat Disord. 2018;54:30-39.

14. Khedr EM, Fawi G, Abbas MAA, Mohammed TA, el-Fetoh NA, Attar GA, et al. Prevalence of Parkinsonism and Parkinson's disease in Qena governorate/Egypt:a cross-sectional community-based survey.Neurol Res. 2015;37(7):607-618.

15. Benito-Leon J, Bermejo-Pareja F, Rodriguez J, Molina JA, Gabriel R, Morales JM, et al. Prevalence of PD and Other types of Parkinsonism in Elderly Populations of Central Spain. Mov Disord. 2003;18:267-274.