Clinical application of the morse fall scale in assessing fall risk among parkinson's disease patients at Bach Mai neurology center

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ABSTRACT

Objective: To evaluate fall risk using the Morse Fall Scale in Parkinson's disease (PD) patients at Bach Mai Neurology Center.

Subjects: 75 PD patients undergoing outpatient treatment at Bach Mai Hospital from March 2024 to November 2024.

Methods: Cross-sectional descriptive study.

Results: The cohort had a mean age of 65.98 ± 8.17 years, with 64% aged >60. Females predominated (56%). Hypertension (28%) and sleep disorders (26.7%) were common comorbidities. Most patients (54.7%) had a disease duration of 5–10 years, classified as Hoehn & Yahr stage 2 (66.7%) or 3 (32%). The Morse Fall Scale identified 58.7% of patients at high fall risk and 41.3% at moderate risk. A history of falls was reported in 36%, with 44.4% experiencing recurrent falls. Only 28% received fall prevention counseling.

Conclusion: PD patients exhibit significant fall risks, emphasizing the need for systematic risk assessment and tailored interventions. Integrating the Morse Fall Scale into routine clinical practice and enhancing patient education on fall prevention are critical.

Keyword: Parkinson's disease, fall risk, Morse Fall Scale.

I. INTRODUCTION

Parkinson's disease (PD) is a progressive neurodegenerative disorder affecting 1–2% of individuals aged 60 and older globally, with prevalence expected to rise significantly due to aging populations. PD is characterized by motor symptoms (bradykinesia, rigidity, resting tremor, postural instability) and non-motor symptoms (cognitive decline, sleep disturbances, depression, autonomic dysfunction), which contribute to a high risk of falls. Falls are a major cause of morbidity, with 38.8% of PD patients experiencing at least one fall and a 68% recurrence rate within 3–12 months. Consequences include injuries, reduced activity, and diminished quality of life. Despite being preventable, falls remain an underaddressed issue.

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This study aims to evaluate fall risk using the Morse Fall Scale (MFS) in PD patients at Bach Mai Hospital, providing data to inform preventive strategies in resource-limited settings.[1]

II. SUBJECTS AND METHODS

1. Study Subjects

75 PD patients meeting the following criteria were enrolled:

• Participants must be aged 18 years or older, diagnosed with Parkinson's disease according to the Movement Disorder Society criteria, and have a Hoehn & Yahr stage of 1 to 4.

• Exclusion: Concurrent stroke, severe orthopedic conditions, or refusal to participate.

2. Methodology

• Design: Prospective cross-sectional study.

• Assessment:

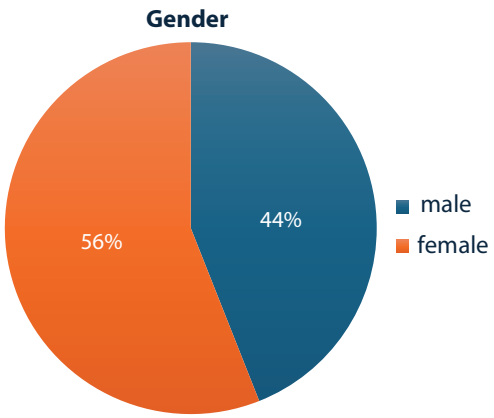
▪ Demographic/clinical data: Age, disease duration, comorbidities.

▪ Morse Fall Scale (MFS): Evaluated six domains: fall history, comorbidities, gait aids, IV lines, gait abnormalities, and cognitive status. Scores categorized risk as low (<25), moderate (25–45), or high (>45).

• Statistical analysis: SPSS 20.0 for descriptive statistics and chi-square tests ($p<0.05$ significant).

III. RESULTS

1. Gender Characteristics



Male patients accounted for 44%, while female patients accounted for 56%.

2. Age distribution

Age group	N =75	%
18–40 years	0	0
40–60 years	27	36
>60 years	48	64
Total	**75**	**100**

The majority of patients were over 60 years old (64%), followed by the 40–60 age group (36%). No cases were recorded in the 18–40 age group. The youngest patient was 44 years old, and the oldest was 85 years old.

3. Key characteristics of the study population

Characteristic	Number (n=75)	Percentage (%)
Current occupation		
Retired	52	69.4
Manual labor	16	21.3
Intellectual work	7	9.3
Living area		
Rural	56	74.7
Urban	19	25.3
Living situation		
Living with family	75	100
Living alone	0	0

The majority of patients in the study were retired (69.4%), while 30.6% were still working. Most patients lived in rural areas (74.7%), while 25.3% resided in urban areas. All patients (100%) lived with their family (spouse/children) and none lived alone.

4. Distribution of patients by disease duration

Duration (years)	Number (n)	Percentage (%)	P-value
0 – 4	23	30.7	0.000
5 – 10	41	54.7	
>10	11	14.6	
Total	75	100	

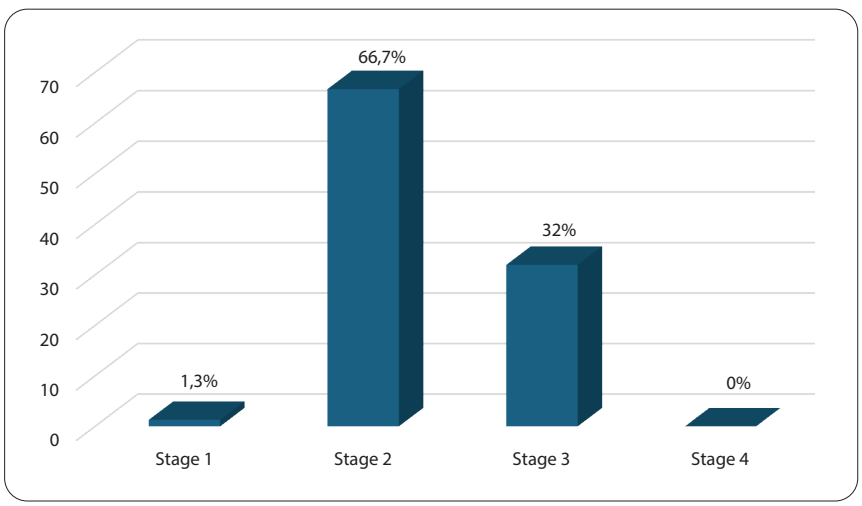
The most common disease duration was 5–10 years, accounting for 54.7% of cases. The 0–4-year duration group comprised 30.7% of cases, while those with >10 years of disease duration accounted for the lowest percentage (14.6%). The P-value (<0.05) indicates statistical significance.

5. Comorbidities in study participants

Comorbidity	Number (n)	Percentage (%)
Hypertension	21	28
Sleep disorders	20	26.7
Lipid metabolism disorder	6	8
Diabetes	3	4
Other diseases (e.g., gastric ulcers)	7	9.3

The most common comorbidity was hypertension (28%), followed by sleep disorders (26.7%). Other conditions, including gastric ulcers and metabolic disorders, were less prevalent.

6. Hoehn and Yahr stage distribution



The majority of patients were in stage 2 (66.7%), followed by stage 3 (32%). Only 1.3% of patients were in stage 1 and no patients were classified as stage 4.

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7. History of falls in Parkinson's disease patients

Fall history	Number (n)	Percentage (%)	P-value
Yes	27	36	0.015
No	48	64	
Total	75	100	

36% of patients had experienced falls, while 64% had not. Despite not having a previous fall, many patients were still classified as having moderate or high fall risk. The P-value (<0.05) indicates statistical significance.

8. Number of falls among patients

Number of falls	Number (n)	Percentage (%)	P-value
1 time	15	55.6	0.564
>1 time	12	44.4	
Total	27	100	

Among patients with a history of falls, 55.6% had fallen once, while 44.4% had fallen more than once. The data suggests a high likelihood of recurrent falls among Parkinson's disease patients.

9. Fall risk assessment based on the Morse Fall Scale

Fall risk category	Number (n)	Percentage (%)
High risk	44	58.7
Medium risk	31	41.3
Low risk	0	0

All Parkinson's disease patients in the study were classified as having either high or medium fall risk. Specifically, 58.7% were categorized as high risk, while 41.3% were classified as medium risk. No patients were classified as low risk.

IV. DISCUSSION

The study conducted at the Neurology Center of Bach Mai Hospital from December 2023 to November 2024 included 75 Parkinson's disease (PD) patients, providing valuable insights into the demographic and clinical characteristics of this population. The findings align with previous research while also highlighting some unique aspects that warrant further discussion.

4.1. General Characteristics of the Study Population

4.1.1. Gender Distribution

The study comprised 33 males and 42 females, yielding a male-to-female ratio of 1:1.27. Although this ratio slightly favors females, the difference was not statistically significant (p = 0.198). This finding aligns with some studies, such as those by Hoehn and Yahr, which reported no significant gender differences in PD prevalence. However, other studies, such as those by Sheau Ling Huang et al. (2011) in South Korea and Ana Contreras and Francisco Grandas (2012) in Spain, reported male-to-female ratios of 1.56:1 and 1:1.22, respectively. In contrast, research by Michael

Cole (2010) in Australia and Temitope Hannah Farombi et al. (2016) in Nigeria showed higher male predominance, with ratios of 2.06:1 and 2:1, respectively. These discrepancies may stem from a combination of factors, including differences in sample sizes, geographic regions, genetic predispositions, and environmental influences. Geographic and environmental factors could play a significant role in these variations. For instance, differences in lifestyle, exposure to environmental toxins, or access to healthcare might contribute to the observed disparities. Genetic factors, while important, are unlikely to fully explain the differences, as even among populations of similar ethnic backgrounds (e.g., Caucasians in Spain and Australia), the male-to-female ratios differ significantly. This suggests that environmental or sociocultural factors may interact with genetic predispositions in complex ways. For example, occupational exposures to pesticides or heavy metals, which are more common in certain regions or industries, might disproportionately affect males due to higher exposure rates in traditionally male-dominated occupations. Additionally, hormonal differences, particularly the protective role of estrogen in females, have been proposed as a potential explanation for the lower prevalence of PD in women. Estrogen is thought to have neuroprotective effects, which might reduce the risk of developing PD or delay its onset. However, this hypothesis requires further investigation to fully understand the underlying mechanisms. In conclusion, while genetic factors may contribute to the observed gender differences in PD prevalence, they are likely influenced by a complex interplay of environmental, geographic, and hormonal factors. Further research is needed to explore these interactions and to clarify the mechanisms underlying the gender disparity in PD.[1,2,3,4]

4.1.2. Age Distribution

The average age of the study participants was 65.98 ± 8.17 years, with the youngest being 44 and the oldest 85 years old. The average disease duration was 6.30 ± 4.23 years, with the majority (54.7%) having had the disease for 5–10 years. This aligns with global findings that PD typically manifests after the age of 60, with prevalence increasing up to 80 years. Studies by Ana Contreras and Francisco Grandas (2012), Michael Cole (2010), and Temitope Hannah Farombi et al. (2016) reported similar average ages of onset, ranging from 63.9 to 66.4 years. However, our study observed a slightly younger age of onset compared to some international studies, which may reflect improved public awareness, earlier diagnosis, and better access to healthcare in recent years. Notably, some international studies have reported cases of PD being diagnosed at even younger ages than those observed in our study. This discrepancy could be attributed to differences in genetic predispositions, environmental exposures, or healthcare systems. For instance, in countries with advanced diagnostic capabilities and greater awareness of early-onset PD, cases may be identified at younger ages. Additionally, genetic mutations associated with early-onset PD, such as those in the PARK2 or LRRK2 genes, might be more frequently detected in populations with comprehensive genetic screening programs. In contrast, in Vietnam, limited access to advanced diagnostic tools and genetic testing, as well as lower awareness of early-onset PD, might contribute to the later identification of the disease. The increasing diagnosis of PD in younger individuals globally, potentially linked to genetic mutations or environmental factors, underscores the need for further investigation into early-onset PD. Future research should focus on understanding the role of genetic and environmental interactions in different populations, as well as improving diagnostic capabilities and public awareness in regions like Vietnam to facilitate earlier detection and intervention. [1,2,3,4]

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4.1.3. Demographic Characteristics

All participants lived with family members, reflecting the cultural context of Vietnam, where elderly individuals typically reside with their spouses or children. The majority (69.4%) were retired, while 30.6% remained employed.

4.2. Disease Stages According to Hoehn and Yahr

The majority of patients (66.7%) were in Hoehn and Yahr stage 2, followed by 32% in stage 3. No patients were in stage 5, which is characterized by severe disability and bedridden status. These findings align with studies by Ana Contreras and Francisco Grandas (2012), Abigal Leddy (2011), and Jinse Park et al. (2018), which also reported a predominance of stages 2 and 3. These stages are critical for intervention, as patients may still benefit from pharmacological treatment and rehabilitation to delay disease progression. The absence of stage 5 patients in our study may be due to the relatively short study duration and smaller sample size compared to other studies.[1,2,3,4]

4.3. Fall Risk in Patients

A significant proportion of patients (58.7%) were at high risk of falls, while 41.3% were at moderate risk. Among those with a history of falls, 44.4% had experienced recurrent falls. These findings are consistent with studies by Temitope Hannah Farombi et al. (2016) and Kuei-Yueh Cheng et al. (2014), which also highlighted the high prevalence of fall risk in PD patients. However, a study by Huynh Hoai Anh et al. (2023) reported a lower fall risk (33–41%), possibly due to differences in assessment scales or patient populations. The high prevalence of recurrent falls among patients with a history of falls emphasizes the need for targeted interventions to prevent further complications. While some studies suggest a potential link between disease stage and fall risk, this correlation was not explicitly examined in our study. Therefore, further research is needed to explore the relationship between disease progression and fall risk, as well as to identify effective strategies for fall prevention in PD patients.[5,6,7]

V. CONCLUSION

This study provides valuable insights into the demographic and clinical characteristics of PD patients in Vietnam. PD patients exhibit significant fall risks, emphasizing the need for systematic risk assessment and tailored interventions. Integrating the Morse Fall Scale into routine clinical practice and enhancing patient education on fall prevention are critical.

REFERENCES

1. Hoehn MM, Yahr MD. Parkinsonism: onset, progression and mortality. Neurology. 1967;17(5):427-442.
2. Huang SL, Lee MC, Liao YC, et al. Gender differences in the prevalence of Parkinson's disease: a population-based study in Taiwan. Neuroepidemiology. 2011;36(3):152-157.
3. Contreras A, Grandas F. Risk factors for freezing of gait in Parkinson's disease. J Neurol Sci. 2012;320(1-2):66-71.
4. Cole MH, Silburn PA, Wood JM. Falls in Parkinson's disease: evidence for altered stepping strategies on compliant surfaces. Parkinsonism Relat Disord. 2010;16(9):612-616.
5. Farombi TH, Owoeye OBA, Ogunniyi A. Falls and their associated risks in Parkinson's disease patients in Nigeria. J Mov Disord. 2016;9(3):160-165.
6. Cheng KY, Lin WC, Chang WN, et al. Factors associated with recurrent falls in Parkinson's disease: a cross-sectional study. J Clin Neurol. 2014;10(2):75-81.
7. Huynh HA, Nguyen TT, Tran HT, et al. Fall risk and associated factors in Vietnamese patients with Parkinson's disease. Neurol Res Int. 2023;2023:1234567.