

Fear of falls as a determinant behavioral factor to reduce functional mobility in Parkinson's disease

Medo de quedas como fator comportamental determinante para redução da mobilidade funcional e risco de quedas na doença de Parkinson

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ABSTRACT

Objective: To verify the repercussion of the fear of falling on the functional mobility and the actual risk of falls of people with Parkinson's Disease (PD). **Method:** This was a cross-sectional study in which individuals of both sexes with clinical diagnosis of idiopathic PD, at stages 1 to 3 of the original Hoehn and Yahr scale and enrolled in the Pró-Parkinson Program of the Hospital das Clinics of the Federal University of Pernambuco were included. Patients with other neurological diseases, untreated systemic diseases, musculoskeletal disorders, cognitive impairment measured by the Mini Mental State Examination and with moderate to severe depression measured by the Beck depression inventory were excluded. Normality of the sample was tested with the Shapiro-Wilk test and the difference between both groups was assessed with the T-test for independent samples, considering $P < 0.05$. **Results:** The sample was consisted of 18 patients, 11 patients (61%) reported fear of falling with or without a history of falls in the previous year. Significant increase in TUG time was observed in the group with fear of falling in relation to the group without fear of falling ($P = 0.012$). **Conclusion:** The fear of falling seems to be a behavioral factor that has negative repercussions on the functional mobility and the actual risk of falls of patients with Parkinson's disease, therefore health providers must consider this factor when designing treatment protocols for these patients.

Keywords: Parkinson Disease, Accidental Falls, Mobility Limitation, Fear

RESUMO

Objetivo: Verificar a repercussão do medo de cair sobre a mobilidade funcional e risco de quedas de pessoas com Doença de Parkinson. **Método:** Trata-se de um estudo transversal onde foram incluídas pessoas de ambos os sexos, com diagnóstico clínico de DP idiopática nos estágios 1 a 3 da escala original de Hoehn e Yahr e cadastradas no Programa Pró-Parkinson do Hospital das Clínicas da Universidade Federal de Pernambuco. Foram excluídos pacientes que apresentassem outras doenças neurológicas, doenças sistêmicas descompensadas, alterações musculoesqueléticas, rebaixamento do nível cognitivo avaliado por meio do Mini Exame do Estado Mental e com depressão de moderada a grave avaliada pelo inventário de depressão de Beck. Os instrumentos de desfecho utilizados foram o questionário de histórico de quedas e o Timed Up and Go. Para verificar a normalidade da amostra foi utilizado o teste Shapiro-Wilk e para verificar a diferença entre os grupos foi utilizado Teste T para amostras independentes, considerando $P < 0.05$. **Resultados:** Amostra foi composta por 18 pacientes, 11 pacientes (61%) relataram medo de cair com ou sem histórico de quedas no último ano. Aumento significativo no tempo para realização do TUG foi observado no grupo com medo de cair em relação ao grupo sem medo de cair ($P = 0.012$). **Conclusão:** O medo de cair é um fator comportamental que apresenta repercussões negativas na mobilidade funcional e risco de quedas do indivíduo com doença de Parkinson, sendo necessário considerar esse fator na elaboração dos protocolos de tratamento do paciente.

Palavras-chave: Doença de Parkinson, Acidentes por Quedas, Limitação da Mobilidade, Medo

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INTRODUCTION

After Alzheimer's disease, Parkinson's disease (PD) is recognized as the most common neurodegenerative disorder. The average age of onset PD is approximately 60 years, however, the number of patients with early onset PD, aged 40 to 50 years and below, is increasing. The prevalence of PD is apparently age-related, which is less than 0.5% of the population under 50 years of age and increases to 4% in the population above 80.¹

With the progress of PD, mobility of individuals becomes impaired and consequently activities such as getting up and sitting in a chair, changing position and walking become significantly difficult to perform, and it increases the risk of falling.²

Falling is one of the main determinants of decreased mobility and reduced life expectancy in people with PD. The risk of falls in patients with PD is twice as high as in the population without this disease, and this risk increases as the disease progresses.³

Factors associated with future falls and limitation of functional mobility include the fear of falling itself.⁴ Fear of falls in PD has been suggested as a predictor of future falls and is associated with more limitations in daily living activities and fewer physical activities.⁵

Fear of falling is a common and not insignificant phenomenon among people with PD, and it is experienced as a disturbing factor in daily life that affects the routine in many aspects.⁶ However, in the clinical practice of physical therapy, fear of falling is scarcely explored in evaluations and assessments.

The understanding of the repercussions of fear of falling on functional mobility and risk of falls of people with PD is important for the planning of therapeutic strategies and for clinical care.

OBJECTIVE

In this context, this study was designed to verify the repercussion of the fear of falling on functional mobility and risk of falls itself on patients with Parkinson's disease. Our hypothesis is that fear of falling is an important behavioral factor that may lead to reduced mobility and increase risk of falling in this population.

METHODS

This is a cross-sectional study that included people of both sexes, with clinical diagnosis of idiopathic PD according to Ministerial Order No. 228/2010 of the Brazilian Ministry of Health,⁷ at stages HY1 to HY3 (Original version

of Hoehn and Yahr classification)⁸ who were listed in the Pro-Parkinson Program of the Clinical Hospital of the Federal University of Pernambuco. Patients with other neurological diseases, untreated systemic diseases, musculoskeletal disorders, low cognitive level assessed with the Mini Mental State Examination (MEEM),⁹ and with moderate to severe depression assessed by the Beck Depression Inventory (BDI) were excluded.¹⁰ The outcome assessments were the History of Fall Questionnaire² and the Timed Up and Go (TUG).¹¹

History of Falls Questionnaire

To investigate the fear of falls, the history of falls questionnaire was used. This evaluation reports the falls that occurred in the patient's daily life. From this questionnaire the following questions were used:

1. Did you stumble in the last 12 months, for any reason, even if it was not caused by the Parkinson disease?

2. How many times did you fall in the last 12 months (daily / weekly / monthly / etc.)?

3. Are you afraid of falling?²

In TUG evaluation, the patient is instructed to get up from a chair, walk for three meters, turn around, return and sit back in the chair. A time of 10 seconds or less indicates low risk of falls of independent individuals with unchanged functional mobility; 20 seconds or less: medium risk of falls of individuals with independence in basic transfers; 30 seconds or more: high risk of falls of dependent individuals on activities of daily living and with impaired mobility. The TUG was performed once for patient familiarization and then three more times, and the result was obtained by averaging the three tests.

To verify the normality of the sample, the Shapiro-Wilk test was used and to verify the difference between the groups, the T test for independent samples was used, and the significance was set at $P < 0.05$ (BioEstat 5.0 Software).

The study was approved by the Ethics Committee on Human Research of the Health Sciences Center of the Federal University of Pernambuco, under No. 46155315.3.0000.5208, in accordance with the ethical criteria advocated by the Declaration of Helsinki and Resolution 466 of 12 December 2012 of the Brazilian National Health Council.

RESULTS

A normally distributed convenience sample of 18 patients with PD were composed

of 14 male subjects with 64 (7) years of age, and time after diagnosis of 6 (3) years at stages HY1 to HY3 (HY1, N = 6; HY2, N = 9 and HY3, N = 3). All these patients were considered normal according to MEEM and BDI.

Most patients (72%) did not have history of falls in the previous year, however, 11 patients (61%) reported fear of falling with or without history of falls over this period. Significant increase of time for performing the TUG was observed in the group of patients with fear of falling when compared to those without this fear (Figure 1).

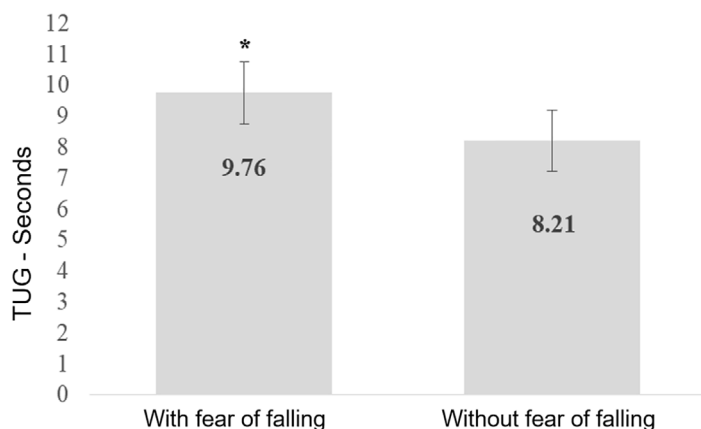
DISCUSSION

The results of this study indicate that fear of falling is a behavioral factor that may contribute to reduced mobility and increased risk of falling in people with Parkinson's disease, given that the group with fear of falling had longer time in TUG when compared to the group without fear falling. Moreover, although 72% of patients did not report falling in the last year, 61% reported that they were afraid of falling, i.e. the fear of falling was present even in the absence of falls in the previous year.

In the context of functional mobility, TUG assesses patients' ability to move from sitting to standing and its relationship to dynamic balance, i.e. longer time to perform TUG can impact on both basic or complex skills as sitting and standing or as walking, respectively. Longer time to conclude the TUG also suggests greater risk of falling.

According to the findings of our study, fear of falling seems to be a factor that contributes to the worsening of functionality of patients with PD. It is noteworthy that during the execution of the TUG patients were instructed to walk as fast as they could without running. Nevertheless, patients with fear of falling underperformed when compared with patients without fear of falling. This result emphasizes the need for personalized interventions to minimize the fear of falls in this population.

However, how can a behavioral factor, such as fear, contribute to worsening functional mobility and a higher risk of falling in PD patients? Our hypothesis is that the presence of this behavioral factor may lead individuals with Parkinson's disease to understand their functional limitations more intensely and thus reduce their exposure to performing activities of daily living, preventing them from achieving their best performance. This, in turn, may lead to a vicious cycle of fear of falling, limitation of functional mobility, evident worsening of motor performance and consequently a higher risk of falling.



Independent samples T-Test. *P=0.012.

Figure 1. TUG results between both groups

This idea is corroborated by the study by Jonasson et al.⁶ that, with a semi-structured questionnaire, examined the views and experiences of 12 people with PD on sensitive topics such as fear of falling. In this study the fear of falling was felt by PD patients as a disturbing factor in daily life, generating a sense of vulnerability and transforming trivial daily activities and everyday environments to appear potentially dangerous. Thus different self-protection strategies were assumed by these patients, such as avoiding the conducts such activities.

An intriguing finding is that both patients with experience of falls in the previous year and those without this experience reported fear of falling. This may indicate that the fear of falling is not necessarily related to the experience of previous falls.

Another aspect to consider is whether fear arose before changes in functional mobility or if the individual first experienced changes in functional mobility and secondarily developed the fear of falling. According to Lindholm et al.,¹² fear of falling is a predictor of future falls in the early stages of PD. This suggests that fear is present even without significant motor changes,

given that in the early stages of the disease the patient has mild symptoms, with no significant impairment to activities of daily living.⁷

The main limitation of this study is the small sample size and the analysis of only one outcome. Studies with a larger number of patients and broader investigation methodology to dig into aspects of mobility and gait in this population may explain the relationship between fear of falls and functional mobility and risk of falls itself.

CONCLUSION

The results of this study suggest that fear of falling is a behavioral factor that has negative repercussions on functional mobility and the risk of falls itself of individuals with Parkinson's disease, and it is necessary to consider this factor in the elaboration of treatment protocols.

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