Low back pain prevalence in Parkinson's disease

Prevalência da dor lombar na doença de Parkinson

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ABSTRACT

BACKGROUND AND OBJECTIVES: Low back pain is a non-motor symptom commonly reported by individuals with Parkinson's disease. The aim of this study was to identify the prevalence of low back pain and its characteristics in individuals with Parkinson disease from a specialized treatment center.
METHODS: Individuals with idiopathic Parkinson's disease answered a questionnaire for the assessment of clinical parameters and associated pain symptoms. Pain intensity was assessed using the visual analog scale.
RESULTS: One hundred and twenty-three patients with mean age 68.1±11.8 years, and disease duration of 7.0±4.9 years, answered the questionnaire. Pain was reported by 102 (82.9%) patients: 71 (57.7%) had low back pain and 31 (25.2%) had pain in other body segments. There was no difference in age, education, time of Parkinson's disease symptoms and diagnosis when comparing individuals with and without pain, as well as individuals with pain in other segments and low back pain. The group with low back pain had pain in a greater number of body segments in addition to the lumbar region, with longer duration of this symptom and more frequent use of analgesic drugs. In the low back pain group, women had greater pain intensity.
CONCLUSION: The results show the high prevalence of pain in individuals with Parkinson's disease, specifically low back pain.
Keywords: Low back pain, Pain, Parkinson's disease, Prevalence.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor lombar é um sintoma não motor comumente relatado por indivíduos com doença de Parkinson. O objetivo deste estudo foi identificar a prevalência de dor lombar e suas características em indivíduos com doença de Parkinson em um centro de tratamento especializado.
MÉTODOS: Indivíduos com doença de Parkinson idiopática responderam a um questionário para a avaliação de parâmetros clínicos e sintomas de dor associados. A intensidade da dor foi avaliada utilizando a escala analógica visual.
RESULTADOS: Cento e vinte e três pacientes com idade média de 68,1±11,8 anos e duração média da doença de 7,0±4,9 anos responderam o questionário. A dor foi relatada por 102 (82,9%) pacientes: 71 (57,7%) com dor lombar e 31 (25,2%) com dor em outros segmentos corporais. Não houve diferença quanto à idade, escolaridade, tempo de sintomas e de diagnóstico da doença de Parkinson ao comparar os indivíduos com e sem dor, assim como indivíduos com dor em outras regiões e dor lombar. O grupo com dor lombar queixava-se de dor em maior número de segmentos corporais além da região lombar, com maior tempo de duração desse sintoma e uso mais frequente de analgésicos. Dentre os indivíduos do grupo com dor lombar, as mulheres apresentavam maior intensidade da dor.
CONCLUSÃO: Os resultados mostraram alta prevalência da dor em indivíduos com doença de Parkinson, especificamente da dor lombar.
Descritores: Doença de Parkinson, Dor, Dor lombar, Prevalência.

INTRODUCTION

Pain is one of the most common non-motor symptoms of Parkinson's disease (PD) and its rate of prevalence is between 40 and 85%[1-4]. The great range of the prevalence rates is justified by the variety of research designs and pain questionnaires that are used, as well as the different kinds of pain evaluated[2].
According to the study[5], pain in PD can be classified as dystonic, radicular/neuropathic, central neuropathic, related to akathisia and musculoskeletal. Pain of musculoskeletal origin is one of the most common[3] and its occurrence is reported by up to 70% of patients[4]. The patients usually present pain symptoms in different segments of the body, like pain in the shoulder resul-

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ting from adhesive capsulitis and joint pain in lower extremities (LE)[5,6]. The lumbar region is one of the segments of the body that are more affected and individuals with PD present higher rates of constant low back pain (LBP) of musculoskeletal origin when compared to individuals of the control group[6-8]. Patients commonly report pain, muscular tension or stiffness located below the costal margin and above gluteal fold, associated or not with pain in the LE[9].

LBP is classified as specific when symptoms are caused by a defined physiopathological mechanism, like disc herniation and fracture; or non-specific, that is, without a well-defined etiology, being the most common and representing approximately 90% of likely LBP[9] occurrences. In PD, the progression of the disease results in axial skeletal abnormalities such as scoliosis[10], excessive neck flexion (dropped head)[11], trunk flexion (camptocormia)[12] and Pisa's syndrome[13], which may increase the risk of LBP. The intensity of LBP is associated with the severity of the PD motor signs and the more advanced stage of the disease[8].

LBP presents multifactorial impact and, besides the pain itself, it has wider consequences, like limitations in activity, participation restrictions, overload of caregivers, use of medical assistance resources and financial charges[14]. Despite its prevalence in patients with PD, the studies that address this phenomenon are sparse[6-8,15]. The objective of this study was to verify the prevalence of PD and its characteristics in patients with LBP that attend a specialized center in Belo Horizonte.

METHODS

This is an observational study developed at the Neurology Outpatient Clinic of the Medical Specialties Center of the Santa Casa de Belo Horizonte. The convenience sample, obtained in the period from March 2017 to May 2018, consisted of individuals with idiopathic PD diagnosis, according to the clinical diagnostic criteria of the United Kingdom Parkinson's Disease Society Brain Bank[16]. The individuals had to be able to understand and answer the clinical and sociodemographic questionnaire and sign the Free and Informed Consent Term (FICT). Patients that had significant orthopedic compromises in the LE, surgery and/or fracture in the lumbar spine and pain caused by cancer were not included. The visual analog scale (VAS) was used for measuring the intensity of pain, whose score varies from zero to 10 points, according to the patient's report[17].

The patients were divided in the following groups: NPG – no pain group; PG - group with pain that was subdivided into LBPG - group with LBP and NLBPG - group without LBP, but with pain in other body segments.

This study was approved by the Research Ethics Committee of the *Universidade Federal de Minas Gerais* (CAAE 60936016.3.0000.5149) and the *Santa Casa de Belo Horizonte* (60936016.3.3001.5138).

Statistical analysis

Descriptive statistics was used to describe the variables. The one factor ANOVA was used for the comparison of age, schooling, time of symptoms and PD diagnosis between the groups. The Chi-square or Fisher's Exact tests were used to compare qualitative variables. The T test for independent samples or Mann-Whitney test were used to compare the quantitative variables. The tests were selected according to the distribution of variables previously evaluated by the Shapiro-Wilk test. The Spearman correlation coefficient was used to correlate the scores obtained from the VAS with age, time of symptoms and PD diagnosis. The statistical software used was the SPSS (version 21.0), considering $p<0.05$ as the significance level.

RESULTS

One hundred and twenty-three patients, 75 men and 48 women, with mean age of 68.1±11.8 years old and mean PD time of 7.0±4.9 years answered the questionnaire. Only 21 (17.1%) had no complaints of pain. The mean and standard deviation of age were 70.7±13.4 years old for NPG and 67.6±11.4 years for PG. In both groups, there was a predominance of males (61.9% of NPG and 60.7% of PG). The average educational level, determined by the totality of years studied, was 4.7±2.7 and 5.7±3.9 years for NPG and PG, respectively. Most of the individuals were retired. No statistically significant differences were found for sociodemographic variables when comparing NPG and PG patients. Regarding clinical characteristics, it was observed that the mean time of symptoms and diagnosis of PD was 5.8±3.9 and 5.5±3.8 years for NPG and 8.3±5.2 and 7.3±5.1 years for PG, respectively. The use of levodopa was reported by 95% of the patients in both groups. There was no difference for the use of entacapone and amantadine, but the use of pramipexol was higher for PG in relation to NPG (51 versus 28.6%, p=0.023). There was no difference regarding the prevalence of associated diseases in NPG and PG: neuropsychiatric alterations (57.1% x 47.1%), hypertension (42.9 x 49%), heart diseases (28.6 x 20.6%), diabetes (14.3% x 13.7%), dyslipidemia (14.3 x 10.8%) and hypothyroidism (9.5 x 14.7%).

Of the 102 (82.9%) patients in the PG, 71 (57.7%) presented pain in the lumbar region and occasionally in another region (LBPG) and 31 (25.2%) reported pain in another body region, with the exception of the LBP (NLBPG) (Table 1). No differences were found for age, time of symptoms and diagnosis of PD for NLBPG and LBPG. Pain duration in years and frequency of analgesics use were higher for individuals with LBP. These patients commonly reported pain in more body segments. Regarding LBPG, for 28 (39.4%) patients the pain started before the diagnosis of PD. However, there was no difference in pain intensity when comparing individuals who started having LBP before or after PD (p=0.681). There was no correlation between pain intensity and age, time of symptoms and time of PD diagnosis. In the comparison between men and women from this group, there was no difference in age, education, time of symptoms and time of PD diagnosis. The duration of pain in years was also no different between men and women (p=0.069), but the intensity of LBP was higher in women (female VAS: 7.1±2.7; male VAS: 5.4±3.3, p=0.014).

Table 1. Clinical data of the patients with and without low back pain

Variables	NLBPG (n=31)	LBPG (n=71)	p-value
Time of PD symptoms (years)	7.7±4.7	8.5±5.4	0.652[&]
Time of PD diagnosis (years)	7.1±4.5	7.5±5.3	0.870[&]
Time of pain (years)	3.1±1.3	4.1±1.6	**0.004**[&]
Pain sites (n and %)			
Head, face	7 (22.6)	5 (7.0)	**0.041***
Cervical spine/SE	11 (35.5)	35 (49.3)	0.197
Thoracic spine/ abdominal region	4 (12.9)	6 (8.5)	0.487
LE	22 (71)	41 (57.7)	0.206
Number of regions with pain; median (min - max)	1 (1-4)	2 (1-4)	**<0.001**[&]
One region (n and %)	18 (58.1)	19 (26.8)	
Two regions (n and %)	10 (32.3)	19 (26.9)	
Three regions (n and %)	3 (6.5)	17 (23.9)	
Four or more regions (n and %)	1 (3.2)	16 (22.5)	
Analgesic (yes) (n and %)	4 (12.9)	46 (64.8)	**0.003***
Pain intensity	6.0±2.0	6.1±3.1	0.243[&]

NLBPG = individuals with pain, with the exception of LBP; LBPG = individuals with LBP; PD = Parkinson's disease; SE = superior extremities; LE = lower extremities; data presented as mean±standard deviation, absolute value, median (minimum-maximum). [#]Test T for independent samples. [&]Mann-Whitney test. *Fisher's Exact test. Chi-square test for other comparisons. Values in bold (p<0.05).

DISCUSSION

The study sample consisted of elderly individuals, mainly males, compatible with the results of systematic reviews that show the increased prevalence[18] and incidence of PD with aging, in addition to higher incidence in men when compared to women for the age group of 60 to 79 years old[19]. There was a high prevalence of pain and specifically of LBP in individuals with PD, corroborating other findings in the literature[1,4,6-8,15,20,21].

Although pain is a highly prevalent symptom in PD, much information is still inconclusive. It's suggested that muscular rigidity, the prolonged permanence in asymmetric postures or in flexion and osteoporosis are factors that can possibly contribute to the high prevalence of LBP in patients with PD[22]. Study[7] showed that the group of patients with LBP obtained higher scores for the items of tremor of the Unified Parkinson Disease Rating Scale, but no statistically significant difference was found.

These same authors proposed that the axial skeletal abnormalities that occur with the progression of the disease may emerge as independent risk factors for the development of LBP, establishing a close relationship between chronic LBP and flexion posture[7]. Postural changes can cause LBP through different mechanisms, including impact, abnormal load or stress on muscles and ligaments, as well as on joint facets and intervertebral discs[7].

The results did not point to differences for age, time of symptoms and time of PD diagnosis between PG and NPG, just as there was no association between these variables and the intensity of pain, which is in line with other studies' findings[20]. The study[8] identified that in patients with chronic LBP, the intensity of pain is associated with more advanced stages of PD, the higher severity of signs and symptoms evaluated by the subsection III of the Unified Parkinson Disease Rating Scale, as well as with the akinetic-rigid phenotype[8].

The radiographic exams of the lumbar spine revealed high prevalence of arthrosis and spondylolisthesis in patients with PD and LBP. These exams also determined that the lateralization of scoliosis and the PD symptoms were significantly correlated[8]. Another study[23] identified that the motor function stage, motor complications such as dyskinesia and wearing-off deterioration, flexion posture with diminishing lumbar lordosis and lumbar range of motion are factors that intensify LBP.

In the present study, the use of analgesics was higher in patients of LBPG when compared to the patients of NLBPG. A reason for this difference may be that these individuals had complaints of pain symptoms in a higher number of body segments besides LBP. Studies show rates from 34%[4] to more than 50%[1] of patients using drug treatments. However, a study[4] showed that 50% of patients did not receive any intervention for the treatment of pain. These data show the importance of the diagnosis of pain in PD and adequate therapeutic management, avoiding the indiscriminate use of drugs.

Contrary to the results of the study[7], this study showed that the use of pramipexol, a dopaminergic agonist, was higher in PG patients. Although information on the relationship between the antiparkinsonian drug and symptoms of pain is inconclusive, the progression of motor alterations, such as rigidity, can influence pain symptoms of musculoskeletal origin[7]. In addition, this drug is indicated for the treatment of the restless legs syndrome (RLS). RLS features unpleasant sensations, like dysesthesia or paresthesia, commonly in the LE, which can occur when the individual is awake and mainly during rest. RLS has been associated with symptoms of pain, favoring the occurrence of depression, compromising the quality of life of patients with PD[3]. These two reasons could explain, in part, this result, indicating that patients with pain may present greater severity of the motor signs and non-motor symptoms of PD in the evaluated sample. Future studies are needed for a more detailed evaluation.

Although there was no difference regarding the distribution of sex between PG and NPG, the present findings showed that, among the individuals of LBPG, women reported higher intensity of pain. Differently, authors observed that being female was a significant predictive factor for pain in PD[4]. Another study[24] observed higher frequency of this non motor symptom in women.

A higher risk for the development of pain was reported in female patients with PD, in patients with more severe parkinsonian symptoms, and in individuals with PD associated with motor complications and depression[25,26]. Nonetheless, these factors were not assessed in the present study. A higher mean time of pain was observed for LBPG, with approximately 40% of patients first having symptoms before the disease was diagnosed. These results are in line with other studies that show that non-motor symptoms can precede motor alterations and the diagnosis of PD, characterizing the prodromal phase of the disease[27].

Pain is commonly reported by individuals with PD and efforts have been made to investigate this symptom, however, there are few studies evaluating this symptom in the Brazilian population and there are no reports regarding LBP[28,29]. Despite the present

study's limitations, as not having results on the type of pain and the specific clinical parameters of LBP, the present findings indicated the necessity for a routine evaluation of LBP in individuals with PD, in order to allow for a therapeutic assistance that is adequate to the demands of this population. The drugs and a specific physiotherapy program may reduce LBP and the associated disability, diminishing their long term consequences[23]. Additionally, the usage of antiparkinsonian drugs, prevention and treatment of osteoporosis, besides the practice of therapeutic exercises for the management of the torso posture and mobility of the lumbar are indicated for the management of LBP in individuals with PD[23]. Such interventions should be multidisciplinary, integrating a group of therapeutic cares and techniques[30,31]. These results are in line with the literature, reinforcing the importance of investigating and comprehending the mechanisms relevant to this non motor symptom and its consequences in functionality and quality of life of this specific group of patients.

CONCLUSION

The study pointed to a high prevalence of pain in individuals with PD, specially LBP, which has higher duration and more need for analgesics, also taking into account that women presented higher intensity of pain.

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