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Original article

Gait characteristics of women with fibromyalgia: a premature aging pattern

Suelen M. Góes[a,*], *Neiva Leite*[b], *Ricardo M. de Souza*[a], *Diogo Homann*[a], *Ana C.V. Osiecki*[a], *Joice M.F. Stefanello*[a], *André L.F. Rodacki*[a]

[a] *Sector of Biological Sciences, Center for Motor Behaviour Studies, Universidade Federal do Paraná, Curitiba, PR, Brazil*
[b] *Sector of Biological Sciences, Center of Quality of life, Universidade Federal do Paraná, Curitiba, PR, Brazil*

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ABSTRACT

Background: Fibromyalgia is a condition which involves chronic pain. Middle-aged individuals with fibromyalgia seem to exhibit changes in gait pattern, which may prematurely expose them to a gait pattern which resembles that found in the elderly population.
Objective: To determine the 3D spatial (linear and angular) gait parameters of middle-aged women with fibromyalgia and compare to elderly women without this condition.
Methods: 25 women (10 in the fibromyalgia group and 15 in the elderly group) volunteered to participate in the study. Kinematics was performed using an optoelectronic system, and linear and angular kinematic variables were determined.
Results: There was no difference in walking speed, stride length, cadence, hip, knee and ankle joints range of motion between groups, except the pelvic rotation, in which the fibromyalgia group showed greater rotation ($P < 0.05$) compared to the elderly group. Also, there was a negative correlation with pelvic rotation and gluteus pain ($r = -0.69$; $P < 0.05$), and between pelvic obliquity and greater trochanter pain ($r = -0.69$; $P < 0.05$) in the fibromyalgia group.
Conclusion: Middle-aged women with fibromyalgia showed gait pattern resemblances to elderly, women, which is characterized by reduced lower limb ROM, stride length and walking speed.

Características da marcha de mulheres com fibromialgia: um padrão prematuro de envelhecimento

Palavras-chave:
Dor crônica
Envelhecimento
Marcha

RESUMO

Introdução: Fibromialgia é uma condição que envolve dor crônica generalizada. Além disso, mulheres de meia idade com fibromialgia apresentam alterações no padrão de marcha, expondo-se prematuramente a um padrão de marcha semelhante ao encontrado na população idosa.

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* *Corresponding author.*
E-mail: su.goes@gmail.com (S.M. Góes).
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Objetivo: Determinar os parâmetros espaciais (linear e angular) da marcha de mulheres com fibromialgia e compará-los com idosas sem essa condição.
Métodos: 25 mulheres (10 no grupo com fibromialgia e 15 no grupo de idosas) se qualificaram como voluntárias para participar do estudo. A análise cinemática foi realizada por meio de um sistema optoeletrônico, e as variáveis lineares e angulares foram determinadas.
Resultados: Ambos os grupos apresentaram similaridades na velocidade da marcha, tamanho da passada, cadência e amplitude de movimento do quadril, joelho e tornozelo ($p > 0,05$), exceto para a rotação da pelve, na qual o grupo com fibromialgia apresentou maior rotação de quadril ($p < 0,05$) quando comparado ao grupo de idosas. Além disso, houve correlação negativa no grupo com fibromialgia entre rotação do quadril e dor no glúteo ($r = - 0,69$; $p < 0,05$), e entre obliquidade da pelve e dor na região do trocanter maior ($r = - 0,69$; $p < 0,05$).
Conclusão: Mulheres de meia idade com fibromialgia apresentaram um padrão de marcha similar ao de idosas, o qual é caracterizado por amplitude de movimento, tamanho da passada e velocidade da marcha reduzidos.

Introduction

Fibromyalgia (FM) is an impairment disease that involves systemic chronic pain and its pathogenesis and etiology are still not fully understood.[1,2] Functionally, FM is a condition frequently accompanied by diminished physical work capacity[3,4] and muscular fatigue.[5] Difficulties with maintaining concentration during cognitive tasks, neurological complaints (e.g. morning stiffness, muscle pain and spasms) and mechanical impairments (e.g., fatigue and weakness) have also been reported in patients with FM.[5–6] These symptoms may affect their ability to perform simple daily tasks and cause a negative impact on their quality of life.[7]

Gait problems have been listed as a common complaint among patients with FM.[8] Indeed, when compared to a matched control group, subjects with FM show altered gait parameters, characterized by reduced walking speed, cycle frequency, and stride length[9–11] which are also observed in the elderly.[12,13]

Muscle discomfort, as it is seen in FM, is accompanied by reduced range of motion and muscle weakness and is positively correlated with changes in gait.[12–14] For instance, Paschalis et al.[15] showed that subjects with ongoing pain (induced by delayed muscle soreness in response to severe eccentric exercises bouts) alter a number of gait parameters to prevent further muscle damage and/or discomfort. In general, muscle discomfort and pain are accompanied by a reduced range of motion and muscle weakness, which are positively correlated with gait changes and may be related to fall incidence.[12,16–18]

Thus, middle-aged FM subjects who are chronically exposed to pain also show reduced joint range of motion and may present changes on gait pattern likely similar to elderly persons. Researchers found that women with FM (between 40 and 50 years old) exhibit a slow walking speed,[9–11] that is described as the best fall predictor in elderly population.[19,20] In addition, studies have demonstrated a high incidence of reported falls per year among middle-aged women with FM (40%-50%),[17,21,22] which is even higher when compared to the elderly.[23,24] Furthermore, middle-aged individuals with FM may be prematurely exposed to a gait pattern which resembles the one found in the elderly.

Therefore, the aim of the present study was to determine spatial (linear and angular) gait parameters of middle-aged women with FM and compare to a group of elderly women without FM. It was hypothesized that subjects with FM present a gait pattern that resembles the pattern exhibited by the elderly, irrespective of age differences between groups. The gait pattern of middle-aged women with FM was compared to a group of older women without FM, as they are described as to have an altered gait pattern and, thus, are more prone to falls than young and adults.

Methods

Participants

Twenty-one sedentary middle-aged women diagnosed with FM, according to the American College of Rheumatology 1990's criteria[2] from a Rheumatology Ward, volunteered to participate in the study. Twenty-five elderly women (over 65 years old) with a sedentary life-style without FM symptoms were invited from the local community and were allocated in the control groups.

A number of exclusion criteria were applied for both groups and included: (a) the presence of arthritis, (b) arthritis rheumatoid, (c) uncontrolled changes in thyroid, (d) BMI greater than 39 $kg \cdot m^{-2}$ and (e) history of fractures, (f) joint surgery or (g) any other medical problems in the six months before the start of this study which could interfere on gait performance. In addition, the elderly group did not report pain symptoms that could interfere in their daily life activities or walking during data collection.

After applying the inclusion and exclusion criteria, ten middle-aged women with fibromyalgia were allocated in the FM group, while the 15 elderly women without FM composed the elderly group. Sample size was calculated for each group; for both groups it was accepted maximum error of five points