



Original Research—CME

Postural Stability in Osteoarthritis of the Knee and Hip: Analysis of Association With Pain Catastrophizing and Fear-Avoidance Beliefs

Ángel Sánchez-Herán, PT, Diego Agudo-Carmona, PT, MSc, Raúl Ferrer-Peña, PT, MSc, Ibai López-de-Uralde-Villanueva, PT, MSc, Alfonso Gil-Martínez, PT, MSc, Alba Paris-Aleman, MD, PT, MSc, Roy La Touche, PT, MSc, PhD

Abstract

Background: Persons with knee osteoarthritis (OA) are at risk of having sensations of instability and sometimes experience buckling. The instability has been associated with psychosocial dysfunction, such as fear of movement, and impaired physical functioning. A high degree of fear of movement is positively correlated with avoidance in other conditions.

Objective: To evaluate the relationship between postural stability, the degree of pain catastrophizing, and fear-avoidance beliefs in subjects with knee and hip OA.

Design: Descriptive, cross-sectional study.

Setting: Four primary health care centers.

Subjects: Eighty subjects with knee or combined knee and hip OA.

Interventions: Not applicable.

Main Outcome Measurements: Postural stability was evaluated using the Multi-Directional Functional Reach Test (MDFRT), and a battery of self-reports was used to assess the following aspects: pain catastrophizing (Pain Catastrophizing Scale), fear-avoidance beliefs (Tampa Scale for Kinesiophobia [TSK-11] and the Fear-Avoidance Beliefs Questionnaire), pain (visual analog scale), disability (Western Ontario and McMaster Universities Osteoarthritis Index [WOMAC]), and self-efficacy (Chronic Pain Self-Efficacy Scale [CPSS]).

Results: The correlation analysis showed that scores on the MDFRT were negatively associated with scores on the TSK-11 for activity avoidance ($r = -0.54$; $P < .001$) and positively associated with the scores on the CPSS for coping ($r = 0.59$; $P < .001$). The scores for the MDFRT to the right and the total WOMAC were negatively associated ($r = -0.61$, $P < .001$). The scores for the MDFRT to the left were positively associated with the CPSS scores for coping ($r = 0.64$, $P < .001$). The scores for the MDFRT forward were predicted by CPSS and TSK-11 scores (28.9% of variance), as well as activity avoidance, avoidance of physical activity, helplessness (34.7% of variance), and CPSS pain coping (34.3% of variance).

Conclusions: These findings suggest that pain catastrophizing and fear-avoidance beliefs are related with postural stability in subjects with knee and hip OA. Postural stability is negatively correlated with pain catastrophizing and TSK activity avoidance. Thus, based on these results, psychosocial factors should be taken into consideration in the assessment and treatment of patients with hip and knee OA.

Introduction

Osteoarthritis (OA) is the most prevalent diagnosed joint disorder in adults worldwide [1]. This condition is one of most reported reasons for visits to primary care centers, especially in adults aged 45-65 years [2]. The main anatomic sites affected by OA are the vertebrae,

knees, hands, and hip [3]. Quintana et al [4] described the prevalence of symptomatic knee OA as 12.2%; moreover, the prevalence is significantly higher in women (14.9%) than in men (8.7%) and tends to increase by 12% with each year of age.

Pathophysiologically, OA is the result of the degenerative process of articular cartilage and the formation

of new bone matrix that can be assessed radiologically [5]. Pain in OA has multifactorial causes. Nociceptive and neuropathic mechanisms appear to be involved and are mediated by peripheral and central processes [6]. A recent study suggested that central sensitization processes of pain are present in cases of moderate to severe symptomatology [7]. Furthermore, it has been suggested that central processes are strongly influenced by biologic and psychosocial factors [6].

It has been observed that pain catastrophizing has been associated with increasing physical disability [8], increased pain [8], and low self-efficacy [9]. Importantly, OA processes can affect proprioception [10] and postural stability [11], which can also lead to decreased balance, thereby increasing the risk of falling mainly during dynamic activities [12,13]. Recent evidence demonstrated the role of muscle weakness and chronic pain as elements that decrease balance and alter postural stability, which also increase this risk [13]. The risk of falling has become a critical public health problem and can lead to significant limitations and a significant decrease in quality of life in patients with OA [12].

Research estimates that 27% of the population with knee OA are at risk of having sensations of instability, and 18% actually experience buckling [14]. Cases of instability with or without falling were associated with psychosocial dysfunction, such as fear of movement, and impaired physical functioning [14]. In addition, negative psychosocial factors, especially fear of movement, have an adverse impact on pain and disability in patients with OA [15-19]. In fact, a high degree of fear of movement is positively correlated with avoidance when patients with chronic low back pain perform simple movements [20]. This fear of movement and avoidance could be acquired over time through repeated painful stimulus [21]. Thus, this information leads us to propose as our main hypothesis that various psychosocial factors mainly related to a fear-avoidance model have important implications in the balance and stability of patients with OA of the hip and knee.

The primary objective of this study was to examine the degree of pain catastrophizing and fear-avoidance beliefs, as well as their relationship with postural stability in people with hip/knee OA. A secondary objective was to examine which psychosocial factors could serve as predictors of postural stability.

Methods

Study Design

This research is a descriptive, cross-sectional study using nonprobability sampling. One researcher administered the participant appointments and self-report questionnaires, and 2 physiotherapists (AST and RFP), who had 2 and 10 years of experience, respectively, were responsible for collecting all measurements. After

receiving detailed information about the study, the volunteers gave their written informed consent. The physician who diagnosed all of the participating subjects with OA performed the informed consent process with one of the researchers present in the room. All of the procedures used in this study conformed with the ethical norms of the Helsinki Declaration and were approved by the local Ethics Committee of The Center for Advanced Studies University La Salle, Madrid. The reporting of the study follows "Strengthening the Reporting of Observational studies in Epidemiology" (STROBE) guidelines [22].

Subjects

A nonprobability sample of volunteer subjects with OA was recruited from 4 primary health care centers in Madrid, Spain. These 4 centers belong to the national public health system in Spain and provide services mainly to an urban population. Subjects were eligible for the study if (1) they reported bilateral knee pain or combined bilateral knee and hip pain for at least the prior 3 months, (2) they met the American College of Rheumatology criteria for knee and hip OA [23], and (3) there was radiographic evidence of OA affecting their knees or combined knees and hips. Subjects were recruited from November 2013 to June 2014. A family physician confirmed the diagnosis of knee and hip OA through subjective patient histories, clinical examinations, and radiographic findings. The study physician graded individual radiographic features of OA using radiologic standard images and the Kellgren-Lawrence criteria [24]. Exclusion criteria were indications other than primary OA (eg, post-traumatic effects and rheumatoid arthritis) [25].

Data Collection

After consenting to the study, the recruited subjects were given a battery of questionnaires to complete, including various self-reports for demographic and pain-related information. Participants were verbally given standardized instructions; moreover, these instructions were repeated on the questionnaires (eg, the number of questions on the questionnaire, the fact that the questionnaire was printed on both sides of the page, and the purpose of the questionnaire). The sociodemographic questionnaire contained questions regarding gender, date of birth, marital status, living arrangements, educational level, and work status. Pain catastrophizing was assessed using the Pain Catastrophizing Scale (PCS), and fear of movement was measured using validated Spanish versions of the Tampa Scale for Kinesiophobia (TSK-11). Fear-avoidance beliefs were quantified using the Fear-Avoidance Beliefs Questionnaire (FABQ), and pain intensity was measured using a visual analog scale (VAS). Physical disability information was collected

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