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ORIGINAL ARTICLE

Quality of life and functional capacity are adversely affected in osteoarthritis patients with neuropathic pain

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Abstract The aim of this study was to examine the neuropathic pain component of knee osteoarthritis (OA) patients and to investigate the relationship between neuropathic pain, disease stage, functional state, depression, anxiety, and quality of life. This study included 60 patients with knee OA. All demographic data and radiological results were recorded. Visual Analog Scale (VAS), Timed Up and Go Test, Chair Stand Test, Western Ontario and McMasters Universities Osteoarthritis Index (WOMAC), PainDETECT questionnaire, DN4 questionnaire, Short form-36 questionnaire, and Hospital Anxiety Depression Scale were performed for each patient. Neuropathic pain was detected in 66.7% of patients based on the PainDETECT scale and in 46.7% of patients based on DN4 scale. VAS-resting, OA grade, WOMAC scores, and SF-scores showed a significant difference in patients that detected neuropathic pain with PainDETECT ($p < 0.05$). Based on the DN4 scale, patients with neuropathic pain had significantly higher WOMAC scores and significantly lower SF-36 scores ($p < 0.05$). The PainDETECT questionnaire scores showed positive correlations with Timed Up-and-go Test, VAS-resting, WOMAC scores, Hospital Anxiety Depression Scale scores, and a negative correlation with all SF-36 scores ($p < 0.05$). DN4 questionnaire scores showed a negative correlation with SF-36 scores and positive correlation with WOMAC scores ($p < 0.05$). To conclude, it should be kept in mind that patients with knee OA who describe intense pain may have a neuropathic component involved in the clinical condition. Quality of life and functional capacity are adversely affected in patients with knee OA who have neuropathic pain. This should be taken into account while planning the treatment of these patients.

Conflicts of interest: All authors declare no conflicts of interests.

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Introduction

Osteoarthritis (OA) presents with pain, functional disorders, and disability due to age-related loss of cartilage in the joint [1]. The disease process initially starts with the degeneration of the cartilage, continues with inflammation of soft tissues, subchondral bone and synovium, and progresses to joint space narrowing and irreversible destruction of the joint [2]. Risk factors for disease development include age, sex, trauma, extensive use, and genetics. The most commonly affected sites are the cartilage, synovium, and bone tissue [3].

Pain is the most prominent symptom in patients with knee OA and it is associated with loss of function [4]. It has been suggested that abnormal excitability in pain pathways of the peripheral and central nervous system (together with nociceptive and neuropathic mechanisms) are involved in OA [5]. Nociceptive pain is primarily held responsible in patients with knee OA but central sensitization also contributes to the chronic pain in these patients [6]. Animal studies have shown that subchondral bone constitution is rich in sensory nerve fibers and that destruction of this area in OA models leads to the development of neuropathic pain [7,8]. Findings related with neuropathic pain were present in 34% of patients with knee OA in the study by Hochman et al [9] and in 24% of patients in the study by Gölge et al [10].

Progressive pain caused by OA disturbs patient's functional movement ability. This results in loss of workforce, and the associated psychological effects lead to impairments in working life, entertainment, social life, and the sleep pattern of the patient, which greatly compromising quality of life [11,12]. Pang et al [13] reported that impairment of quality of life is more closely correlated with pain level in comparison to other joint symptoms and the radiological degree of injury. In addition to the nociceptive pain, neuropathic pain accompanying the disease also causes mood and sleep disorders and impairment of quality of life [14]. Meyer-Rosberg et al [15] found that quality of life was significantly compromised in patients with chronic neuropathic pain. In addition, Valdes et al [16] showed that the presence of neuropathic pain in patients with OA led to impaired quality of life.

In this study, we aimed to examine the neuropathic pain component associated with patients diagnosed with knee OA. In addition, we wanted to investigate the relationship between neuropathic pain and disease stage, pain level, functional state, depression, anxiety, and quality of life. To our knowledge, this is the first study in English literature evaluating neuropathic pain with more than one assessment questionnaire and trying to determine its functional, psychological effects in knee OA patients.

Methods

Participants

This cross-sectional study included 60 patients with knee OA that suffered from knee pain for a minimum of 3 months. Antero–posterior radiograms of the patients were examined again to confirm the American College of Rheumatology criteria. Patients that had a history of knee-joint operation, had active inflammation, received treatment due to malignancy, had rheumatic or metabolic bone disease or any other acute/chronic central nervous system disease, had cardiac or neurologic disease that can impair quality of life, and functional independence, were detected to have sensory or motor neuropathy (plexopathy, severe radiculopathy, nerve injury, etc.) in electromyography (EMG), had systemic disease such as diabetes or peripheral nervous system disease (polyneuropathy, entrapment neuropathy) that can cause neuropathic pain, and/or were pregnant, were excluded from the study. For all patients, demographic data (age, sex, educational state), body mass index, affected knee (unilateral, bilateral), Kellgren Lawrence radiological stage, and symptom duration were determined. All patients underwent detailed neurological evaluation and previous medical procedures (e.g., roentgenogram, EMG, magnetic resonance imaging, tomography) performed and medical drugs of all patients were reviewed. All participants were informed about the study and provided consent. The study was approved by the local Ethics Committee (approval number: 256).

Radiological evaluation

Knee radiograms of patients were evaluated by a physiatrist, and grading was performed by comparing it with the radiologist report in the hospital imaging system. Radiological grading was made according to the Kellgren Lawrence scale [17]. The scale consisted of a total of five grades, where Stage 0 signifies normal joint space and Grade 4 signifies the severest radiological injury.

Clinical evaluation

Visual Analog Scale

All patients were requested to evaluate their pain while at rest and during movement using a 10-cm Visual Analog Scale (VAS).

Timed Up and Go Test

The Timed Up and Go Test (TUG) is a balance test for the assessment of an individual's functional mobility during daily life. During the test, the patient was asked to rise from a chair, walk 3 m, turn around, walk back to the chair, and sit down. The time to complete the test showed a strong correlation with functional mobility. Additionally, patients that completed the test over 12 seconds were classified as having a high risk of falling in our study [18].

Chair Stand Test

The Chair Stand Test is regarded as one of the most important functional clinical evaluation tests. Patients sit straight back on a chair with a height of 43 cm above the floor keeping their feet flat on the floor and arms crossed at the level of the chest. With a "go" command, they rise to a full standing position and then sit back down again, and repeat this for 30 seconds. A number of times the patient comes to a full standing position within 30 seconds and the test score is recorded. Additionally, patients that had scores above the age and sex-specific limit values

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