



Diz Osteoartritinde Kemik Mineral Yođunluđu ve Radyolojik Bulgular Arasındaki İlişki

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Özet: Osteoporoz ve osteoartrit sıklıkla ileri yaşlarda ortaya çıkar. Mortalite ve morbidite açısından bu iki hastalık oldukça farklıdır. Osteoartrit genellikle normalin üzerinde kemik dansitesi ile ilişkilidir. Kemik yođunluđu açısından radyolojik olarak osteoporoz ile osteoartritin birlikte görüntülenemeyeceđi kabul edilir. Çalışmaların çoğunda bu iki hastalığın negatif ilişkili olduğundan bahsedilir. Bu çalışmaya, geriye dönük olarak diz osteoartriti tanısı almış olan toplam 50 kadın dahil edildi. Tüm hastaların diz röntgenleri deđerlendirildi. Diz osteoartriti evrelemesi, Kellgren-Lawrence skalasına göre yapıldı. Hastaların dosyalarından ağrı skorları kaydedildi. Dual enerji x-ray absorbsiyometri sonuçlarına göre lomber ve femoral bölge g/cm² kemik yođunluđu, t ve z skorları kaydedildi. Biz bu çalışmayı planlarken amacımız, diz osteoartriti hastalarında diz eklemi osteoartriti ile femur ve lomber bölge kemik yođunluđu arasındaki ilişkiyi araştırmaktı. Sonuçta, osteoartritin radyolojik bulgularıyla kemik mineral yođunluđu arasında pozitif ya da negatif ilişki saptanmadı.

Anahtar Kelimeler: Osteoporoz, osteoartrit, kemik mineral yođunluđu

Relationship Between Bone Mineral Density and Radiological Findings in Knee Osteoarthritis

Abstract: Osteoporosis and osteoarthritis are often seen in the older population. These diseases are clearly different clinical conditions with respect to morbidity and mortality. Generally, osteoarthritis is associated with above-average bone density. Osteoarthritis is associated with higher bone mineral density in related area. Osteoarthritis and osteoporosis do not normally present together in respect to radiological findings. Previous studies suggest that osteoarthritis is inversely related to osteoporosis. We retrospectively reviewed 50 women who were diagnosed with knee osteoarthritis enrolled to study. All patients' anteroposterior knee x-ray imaginations were evaluated. Knee osteoarthritis was determined according to the criteria of Kellgren-Lawrence grading scale. Pain score was also recorded from patients' files. Dual-energy X-ray absorptiometry as g/cm² of lumbar and femoral regions, T and Z scores were also recorded. When we were planning this study, our aim was to determine the relationship between knee osteoarthritis and the bone mineral density of the femur and lumbar vertebrae. As a consequence, there was no any relationship between knee osteoarthritis and bone mineral density in women.

Key words: Osteoporosis, osteoarthritis, bone mineral density

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1. INTRODUCTION

Osteoarthritis (OA) and Osteoporosis (OP) are major health problems in the elderly populations. However, the coexistence of these two clinical conditions in patients has been considered to be rare (1). Various reports show that an inverse relationship in OA and OP (2). We thought that there was no sufficient support in this topic in literature, and we investigated the relationship of radiographic OA of the knees and the level of Bone Mineral Density (BMD) in two regions in 50 women.

2. MATERIALS AND METHODS

We retrospectively reviewed 50 women who were diagnosed with knee osteoarthritis enrolled to study.

All patients' files screened from hospital archive. Those with a malignant disease, hyperthyroid/hypothyroid, chronic inflammatory disease, diabetes mellitus, uncontrollable heart and kidney diseases, and the use of any medication were excluded. The major complaints were pain and/or tenderness in all patients. The imaging findings of x-ray, musculoskeletal examination, whole blood count, C-reactive protein, erythrocyte sedimentation rate, and routine biochemical tests were recorded.

All patients' anteroposterior knee x-ray imaginations were evaluated. Knee osteoarthritis was determined according to the criteria of Kellgren-Lawrence grading scale (3). All of the patients had grade II-III knee osteoarthritis, according to radiological classification. Kellgren-Lawrence (KL) grading system (0-4) is the most widely used and accepted standard for diagnosis of radiographic OA. Kellgren-Lawrence (KL) grading system; grade 0: no radiographic features of OA are present; grade 1: doubtful joint space narrowing and possible osteophytic lipping; grade 2: definite

osteophytes and possible joint space narrowing on anteroposterior weight-bearing radiograph; grade 3: multiple osteophytes, definite joint space narrowing, sclerosis, and possible bony deformity; grade 4: large osteophytes, marked joint space narrowing, severe sclerosis, and definite bony deformity.

Pain score was also recorded from patients' files. VAS (6) which assesses the pain intensity and degree of relief experienced by the patient (score of 0 = no pain; 10 = unbearable pain) (4).

All patients were in the postmenopausal period at the time of screening. Dual-energy X-ray absorptiometry as g/cm^2 of lumbar and femoral regions, T and Z scores were also recorded. In diagnosing osteoporosis, T-score was defined to be -2.5 as lumbar Bone Mineral Density (BMD) value below the standard deviation (SD) and $0.759 g/cm^2$ for BMD under the criteria of World Health Organization (WHO) (5).

Statistical Method

Joint spaces were analyzed by paired t-test, the correlation between joint space and BMD values were tested with the Pearson correlation test. SPSS 22.0 packaged software was used in the analyses. $P < 0.05$ was accepted as statistically significant.

3. RESULTS

A total of 50 women with knee osteoarthritis were enrolled in our study. The mean age was 53.41 ± 2.4 years, disease duration was 8.8 ± 1.6 years, and VAS pain was 9.5 ± 1.2 in patients with knee osteoarthritis in patients with knee osteoarthritis. The mean values of joint spaces were 0.25 ± 0.1 ; 0.45 ± 0.4 ; 0.25 ± 0.1 ; 0.45 ± 0.4 mm in right medial, right lateral, left medial and left lateral in respectively. The mean age; the lateral and medial

joint spaces and VAS pain of the patients were shown in Table 1.

There was no significant correlation between BMD values of lumbar and femur regions and radiological knee joint spaces. Further, there were no relationship between radiological knee joint spaces and VAS pain. (Table 2)

4. DISCUSSION

Osteoarthritis is mainly an alteration of the chondral tissue and the most common reason for consultation is the pain (6). Osteoporosis itself does not cause pain. However, osteoporosis can weaken the vertebral body so that it can no longer withstand normal stress or a minor trauma, resulting in a fracture (7).

Osteoporosis and osteoarthritis are unlike conditions. Osteoporosis causes bones to present fragile and vulnerable to fracture, while osteoarthritis is a disease where damage occurs in the joint cartilage and the end of the bones. Osteoarthritis can cause back and knee pain, particularly in older people (8).

It is important to mention that osteoarthritis in the spine can also cause the bone to look denser on x-rays. People with osteoarthritis often have larger bones with a higher bone density, which helps to give bones better strength and makes fractures less likely. Some studies have shown that if you have osteoarthritis you might be less likely to develop osteoporosis (9, 10). On the other hand, we do not know if this is the case.

We wondered what the relationship between parameters in patients with both osteoporosis and osteoarthritis. For this purpose, we evaluated the cartilage loss in the knee joint and its relation to BMD values in two different regions in patients with knee osteoarthritis. We

found that cartilage loss was not related to BMD values. There was no any relationship between radiological findings of knee osteoarthritis and reduced BMD. Our data suggest that osteoporosis and osteoarthritis can be seen in the same patient.

Im Gi et al. (11) have been reported that reduced BMD was related to lower incidence of knee osteoarthritis. Similarly, Dequeker J et al. (12) have emphasized that the inverse relationship between in osteoarthritis and osteoporosis.

Our study was not a comprehensive study. However, these results may shed light on the relation between knee osteoarthritis and osteoporosis in the same patient group.

An objective limitation of this study is the lack of a control group, which is an obstacle in reaching definitive conclusions. Another limitation is the small number of patients. However, we can say lower BMD was not always associated with a lower incidence of knee osteoarthritis.

Although double-blind would be more appropriate for clinical parameters we could not find this opportunity during the study period. Further, the comparative sample size and homogeneity of the sample limit the generalizability of this study. Double-blind, placebo-controlled and long-term follow-up studies are needed to determine the relation between the osteoarthritis and osteoporosis.

Table 1. The mean \pm SD of VAS pain score and Joint space in patients with OA

Parameters	Mean \pm SD
Age (years)	62.5 \pm 3.4
Disease duration (years)	8.8 \pm 1.6
VAS Pain	9.6 \pm 1.1
Right medial joint space (cm)	0.25 \pm 0.1
Right lateral joint space (cm)	0.45 \pm 0.4
Left medial joint space (cm)	0.25 \pm 0.1
Left lateral joint space (cm)	0.45 \pm 0.4
Lumbar total BMD (g/cm ²)	0.72 \pm 3.2
Femoral total BMD (g/cm ²)	0.69 \pm 2.7

VAS: Visual Analogue Scale BMD: Bone mineral density

Table 2. The Relationships between BMD and Joint Spaces

	Right medial joint space	Right lateral joint space	Left medial joint space	Left lateral joint space
Lumbar BMD	r = 0.045 p = 0.770	r = 0.230 p = 0.175	r = 0.045 p = 0.728	r = 0.225 p = 0.176
Femur BMD	r = 0.741 p = 0.628	r = 0.136 p = 0.342	r = 0.725 p = 0.636	r = 0.156 p = 0.352
VAS pain	r = 0.105 p = 0.467	r = 0.153 p = 0.290	r = 0.102 p = 0.425	r = 0.152 p = 0.312

BMD: Bone mineral density, VAS: Visual Analogue Scale

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