RELATIONSHIP BETWEEN HAND OSTEOARTHRITIS AND BENIGN JOINT HYPERMOBILITY

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SUMMARY

Hand OA is a common condition mostly affecting postmenopausal women and causing considerable morbidity. The aim of this study was to determine the association between radiological grades, involved joints, hand-grip strength, and pinch strength in hand osteoarthritis and benign joint hypermobility.

One hundred-six postmenopausal female patients with hand osteoarthritis and sixty healthy postmenopausal women were included in this study. Patients' ages, body mass index (BMI), number of Heberden and Bouchard nodules, proximal interphalengeal (PIP), distal interphalengeal (DIP) and carpometacarpal joint (CMC) involvement, pain scales and Beighton scores were recorded. Our results did not reveal any significant correlation between Beighton scores and radiological grades, involvement localizations, hand-grip strength and pinch strength.

In conclusion we may say that, our hand osteoarthritis patients did not show any relationship between benign joint hypermobility and hand osteoarthritis. This result may be also due to joint limitation caused by osteoarthritis.

Key Words: *Hand osteoarthritis, hand grip strength, Beighton score.*

ÖZET

EL OSTEOARTRİTİ VE BENİGN EKLEM HİPERMOBİLİTESİ İLİŞKİSİ

El osteoartriti en çok postmenopozal kadınları etkileyen ve ciddi morbiditeye yol açan, sık karşılaşılan bir durumdur. Bu çalışmanın amacı, el osteoartriti olan hastalarda radyolojik evre, tutulan eklem, el kavrama gücü, parmak ucu kavrama gücü ile benign eklem hipermobilitesi arasındaki ilişkinin araştırılması idi.

Çalışmaya el osteoartriti olan 106 kadın hasta ile 60 sağlıklı postmenopozal kadın alındı. Hastaların yaşları, vücut kitle indeksleri (VKİ), Heberden ve Bouchard nodül sayıları, proksimal ve distal interfalengial eklem ile karpometakarpal eklem tutulumları, ağrı skorları ve Beighton indeksleri kaydedildi. Sonuçlarımız, Beighton skorları ile radyolojik evre, tutulum lokalizasyonu, el kavrama gücü, parmak ucu kavrama gücü arasında istatistiksel olarak anlamlı ilişki göstermedi.

Sonuç olarak, el osteoartriti olan hastalarımızda Beighton indeksi ile el osteoartriti parametreleri arasında ilişki olmadığını söyleyebiliriz. Ancak bu sonuç el osteoartritli hastalardaki eklem hareket açıklığının kısıtlanmasına da bağlı olabilir.

Anahtar Kelimeler: *El osteoartriti, el kavrama gücü, Beighton skoru.*

INTRODUCTION

Osteoarthritis (OA) is a slowly evolving articular disease characterized by the gradual development of joint pain, stiffness and limitation of motion (1,2). It is thought that, age, systemic factors and genetics lead to a predisposition to osteoarthritis and the site and severity of osteoarthritis are dictated by local biomechanical factors. Some postural abnormalities of joints associated with laxity of ligamentous structures predispose patients to OA (3). Hand OA is a common condition mostly affecting

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postmenopausal women and causing considerable morbidity. It tends to start in middle age and association with menopause has been observed (4).

Hypermobility diminishes rapidly throughout childhood and then more slowly during later life. Females generally show a greater joint range than males. Severe joint hypermobility states and benign articular hypermobility has been proposed in the development of OA (5).

The aim of this study was to determine the association between radiological grades, involved joints, hand-grip strength, and pinch strength in female patients with hand osteoarthritis and benign joint hypermobility.

MATERIAL and METHODS

One hundred-seven female patients with a mean age of 62±8 (range 46-83) admitted to our physical medicine and rehabilitation outpatient clinic who were diagnosed as hand osteoarthritis according to American College of Rheumatology clinical criteria were included in this study. Sixty healthy postmenopausal women whose mean age were 51±7 (range 39-76) formed the control group. All patients were in postmenopausal period. Patients with systemic disease such as rheumatoid arthritis, systemic lupus erythematosus and infectious disease were excluded. Patients' ages, body mass index (BMI), number of Heberden and Bouchard nodules, proximal interphalengial (PIP), distal interphalengeal (DIP) and carpometacarpal joint (CMC) involvement were recorded. Pain was evaluated by visual analogue scale (VAS). Tenderness was recorded on a four point scale (0-3). Heberden and Bouchard nodules were defined as present on one or more digits. Heberden nodule was determined as if Heberden nodule of clinical grade ≥1 were present on one or more digits. Severity of the swelling of Heberden nodules was scored on a four point scale (0-3) (6). Benign joint hypermobility was evaluated by Beighton criteria (5). Beighton criteria are based on the following tests: (1) passive dorsiflexion of the fifth finger ≥90º; (2) passive apposition of thumb to forearm; (3)hyperextension of elbows ≥10º; (4)hyperextension of knees ≥10º, (5)resting palms on floor on forward flexion with straight knees. The first four criteria are bilateral. The criteria are scored from 0 to 9 (5). Hand-grip strength was evaluated using a strength dynamometer (Jamar,USA) while the patient was sitting in a chair, with elbow flexion of 90° (7). The test was performed three times for both hands and the mean value of each hand was recorded in kilograms. Pinch strength measurements were performed with the subject seated by using manual pinchmeter which measures finger prehension force (8).

Statistical analysis was performed by SPPS 9.0. Patients' and controls' tenderness, PIP, DIP and CMC joint involvement parameters were analysed by chi-square test, pain and Beighton scores were compared with Man-Whitney U test.

RESULTS

7,9% of patients with hand osteoarthritis had no Heberden nodes, 11,9% had 1, 28,7% had 2, 27,7% had 3, 19,8% had 4, 4% had 5 Heberden nodes in their right hands. 10,9% of patients had no Heberden nodes in their left hands. 13,9% of patients had 1, 31,7% had 2, 25,7% had 3, 15,8% had 4 and 2% had 5 Heberden nodes in their left hands.

71,3% of patient group had no Bouchard nodes in right hands. 6.9% had 1, 5,9% had 2, 9,9% had 3 and 5,9 had 4 Bouchard nodes in right hands. 71,3% of women with hand osteoarthritis had no Bouchard nodes. 9,9% of patients had 1, 5,9% had

2, 8,9% had 3, 4% had 4 Bouchard nodes in left hands.

51,5% of patients had proximal PIP involvement in right hands and 45,5% had in left hands. 99% of patients had DIP involvement in both hands. 17,8 % of women with hand osteoarthritis had CMC joint involvement in right hands and 18.8% had CMC joint involvement in left hands.

Pain, tenderness, hand grip strength and pinch strength analysis of patients and controls are demonstrated in Table I.

Beighton scores of the 107 hand OA patients were obtained. Twenty of the patients had 4 and higher scores. Nine controls had 4 and higher scores. Hypermobility evaluation results are shown in Table II. Comparison of patients and controls regarding 4 and higher Beighton scores did not reveal statistical significance.

We did not determine any correlation between Beighton criteria and radiological score.

DISCUSSION

Hand osteoarthritis is a common benign articular hypermobility and has been implicated in the development of osteoarthritis.

The term hypermobility syndrome refers to healthy subjects with joint laxity in the absence of major features of the Marfan or Ehlers-Danlos syndromes and arthralgias and soft tissue rheumatism. The syndrome has a marked female preponderance (9). The prevalence of hypermobility varies markedly with age, gender, and ethnicity of the study population (10). Hypermobility may provide an advantage in the performance of certain activities, but by lacking the stability afforded by normal ligaments, hypermobile subjects may be more vulnerable to the adverse effects of injury and overuse.

Jonsson et al (11) investigated the impact of hypermobility on clinical and radiological findings in patients with clinical thumb base osteoarthritis. They also examined whether hand osteoarthritis associ-

Table I Hand-grip strength and pinch strength of patients and controls

	Patients	Controls	p
Hand grip strength (right)	19,45 ± 6,12	22,02 ± 5,48	0,0001
Hand grip strength (left)	19,17 ± 6,06	22,19 ± 5,70	0,0001
Pinch strength (right)	6,04 ± 1,99	7,44 ± 2,20	0,0001
Pinch strength (left)	5,99 ± 2,03	8,74 ± 11,14	0,0001

Table II Beighton score distribution of patients and controls

Beighton Score	Patients		Control	
	(%)	n (=107)	(%)	n (=60)
0	54,7	59	70	42
1	1,6	2	0	0
2	21,9	23	12	8
3	3,1	3	2	1
4	10,9	12	6	4
5	3,1	3	4	2
6	4,7	5	4	2
7	0	0	2	1

ated with hypermobility constitutes a definite radiological subset of hand osteoarthritis. They reported that, female patients with clinical thumb base osteoarthritis had more hypermobility features than controls. In another study of Jonsson et al (12) in 100 patients with established hand OA and 100 matched controls, clinical thumb base OA was more common in subjects with features of articular hypermobility. Hypermobile patients also had more severe thumb base involvement and more disability, but less interphalangeal joint OA.

Bridges et al (13) investigated occurrence and importance of joint hypermobility in adults referred to rheumatology clinics. Their findings supported the hypothesis that joint hypermobility predisposes to musculoskeletal disorders, especially osteoarthritis.

Lewkonia et al (14) reported three elderly female patients who had constitutional hypermobility with associated osteoarthritis; none had extensive involvement of either their inter-phalangeal joints or hips. The findings in these cases suggest that osteoarthritis occurring in hypermobile subjects has a restricted rather than a generalised distribution. Osteoarthritis seen in the elderly may be the result of differing mechanisms at different anatomical sites, and articular hypermobility may be a predisposing factor in only a limited number of joints.

Erdem et al (15) investigated the prevalence of hypermobility in a group of medical doctors. The mean age of female doctors was 29±6 and 17% of them had hypermobility.

In our study we did not determine any significant difference between patients with hand osteoarthritis and healthy controls regarding Beighton criteria. We did not find any relationship between involvement localization in hand and Beighton criteria. The age-related decline in joint mobility attributed to progressive biochemical changes in collagen structure may result in stiffening of the connective tissue components of joints. However, as the patients in this study had osteoarthritis, this situation may have caused some amount of range of motion limitation and cover hypermobility signs. Further prospective studies analysing the development of hand osteoarthritis in subjects with benign joint hypermobility are needed.

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