

Original research-Orijinal araştırma

Determining the prevalence of sacroiliitis in Behçet's disease by magnetic resonance imaging

Behçet hastalığında manyetik rezonans görüntüleme ile sakroiliit sıklığının belirlenmesi

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Abstract

Aim. The aim of this study was to determine the frequency of sacroiliitis in patients with Behçet's disease (BD) by using the magnetic resonance imaging (MRI), a sensitive method for early diagnosis of sacroiliitis. **Methods.** Thirty-eight consecutive volunteered patients who met the classification criteria of the International Study Group for Behçet's Disease and 35 consecutive volunteered age and sex matched subjects with noninflammatory low back pain were enrolled in the study. Sacroiliac MRIs of all subjects were taken. **Results.** There was sacroiliitis in eight (21.1%) of the patients with BD and in seven (20%) of the subjects in the control group. There was no statistically significant difference between the two groups by means of sacroiliitis prevalence ($p>0.05$). The patients with disease duration of ten years or longer were compared with patients with disease duration of less than ten years regarding sacroiliitis prevalence. There was no significant difference between the groups ($p>0.05$). **Conclusion.** According to the results of the present study, sacroiliitis does not seem to be a characteristic finding for joint involvement in BD.

Key words: Behçet's disease, magnetic resonance imaging, sacroiliitis

Özet

Amaç. Bu çalışmanın amacı sakroiliitin erken tanısında duyarlı bir yöntem olan manyetik rezonans görüntüleme (MRG) kullanarak Behçet Hastalığı (BH)'nda sakroiliit sıklığını belirlemektir. **Yöntem.** Uluslararası Behçet Hastalığı Çalışma Grubu'nun sınıflama kriterlerini karşılayan 38 gönüllü hasta ve inflamatuvar olmayan bel ağrısı şikayeti olan yaş ve cinsiyet eşleşmesi yapılmış 35 gönüllü olgu kontrol grubu olarak çalışmaya alındı. Tüm katılımcıların sakroiliak MRG'leri yapıldı. **Bulgular.** BH'lerin sekizinde (21,1%), kontrol grubundaki olguların yedisinde (20%) sakroiliitis vardı. Gruplar arasında sakroiliit görülme sıklığı açısından istatistiksel olarak anlamlı bir fark yoktu ($p>0,05$). Hastalık süresi on yıldan az olan BH'ler ile on yıl ve daha fazla olan BH'ler sakroiliit sıklığı açısından karşılaştırıldığında gruplar arasında istatistiksel olarak anlamlı bir fark yoktu ($p>0,05$). **Sonuç.** Bu çalışmanın bulgularına göre sakroiliit BH için karakteristik bir eklem tutulumu olarak görünmemektedir.

Anahtar sözcükler: Behçet hastalığı, manyetik rezonans görüntüleme, sakroiliit

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Introduction

For many years, there has been a debate whether Behçet's disease (BD) is one of the seronegative spondyloarthropathies (SpA) [1] or sacroiliitis is a feature of BD [2]. Some authors have reported a high frequency of sacroiliitis in Behçet's disease [3] while others reported an equal frequency with healthy controls [4-6].

In the literature, the frequency of sacroiliitis in BD has been investigated by using pelvic roentgenogram [2, 4, 7], computed tomography (CT) [6], and scintigraphy [8]. Magnetic resonance imaging (MRI) is the most preferred method for detecting sacroiliitis in aiding early diagnosis and also in showing the active inflammation in joint space, subchondral bone and also in adjacent connective tissue [9]. However sacroiliitis was investigated with MRI only in suspicious case reports needing definite diagnosis [10], not for determining the frequency of sacroiliitis.

The aim of this study was to determine the frequency of sacroiliitis in patients with BD by using the MRI which is a sensitive method for early diagnosis of sacroiliitis.

Materials and methods

Patients

Thirty-eight consecutive volunteered patients who met the classification criteria of the International Study Group for Behçet's Disease and 35 consecutive volunteered age and sex matched subjects with noninflammatory low back pain who served as controls were enrolled into the study. Disease durations were recorded. This study was approved and reviewed by the Local Ethics Committee. Informed consent was obtained from each subject and the study was performed in accordance with the principles of the Declaration of Helsinki.

Imaging Method

1.5 Tesla Toshiba (Pianissimo, Japan, Tokyo) device was used for routine and 0.2 Tesla Hitachi (Aris Mate, Japan, Tokyo) device was used in claustrophobic patients for MRI investigations. Supine position with the knees at 15 degrees of flexion was maintained in patients. Phase array body helix was used preferentially. Paraaxial (corresponding anatomically to the coronal plan) images were planned via sagittal priming image being parallel to the long axis of sacrum (with an angle of 30-45 degrees to the body axis). T1 weighted images were obtained (T1-W). SE, TE:10, TR:750, thickness 4 mm NAQ:2, time 2.03 minutes were the investigated parameters. T2 weighted images were obtained (T2-W). SE, TE: 120, TR:4000, thickness 4mm NAQ:2, time 3.32 minutes were the investigated parameters. Analysis of the images that were obtained from all participants was performed in two distinct sessions by two radiologists according to the sacroiliitis MR chronicity index (Table 1) [11].

Table 1. MRI chronicity index of sacroiliitis defined from images.

<i>Grade 0:</i> No chronic inflammatory changes of the sacroiliac joints
<i>Grade I:</i> Low subchondral sclerosis without sclerosis-induced blurring of the joint space with or without periarticular fat accumulations and/or ≤ 2 erosions per slice meeting the requirement of a normal joint width
<i>Grade II:</i> Moderate subchondral sclerosis with blurring of $<1/3$ of the articular cleft with or without periarticular fat accumulation and/or >2 erosions per slice. No pseudodilatation of the joint space resulting from confluence of erosions No narrowing of the joint space
<i>Grade III:</i> Pronounced subchondral sclerosis obscuring $>1/3$ of the articular cavity with or without periarticular fat accumulations and/or pseudodilatation of the articular cavity by confluent erosions and/or narrowing of $<1/4$ of the articular cavity
<i>Grade IV:</i> Definitive ankylosis of $>1/4$ of the articular cavity. In ankylosis the articular cavity could be filled with a fat marrow-like
<i>MRI: Magnetic resonance imaging</i>

Statistical Analysis

Independent sample t test and chi-square tests were used to compare the data among patients with BD and controls. Statistical significance was assumed at $p < 0.05$.

Results

Mean age of the 38 patients with BD was 35.32 ± 10.03 years. It was 34.52 ± 10.07 years in the control group including 35 subjects. There was no statistically significant difference between the two groups by means of age ($p > 0.05$). Twenty-four of the BD patients were male, (63.2%) and 14 of them were female (36.8%). Twenty-three of the subjects in the control group were male (65.7%), and 12 of them were female (34.3%). The sex range of groups were comparable ($p > 0.05$).

Sacroiliac MRI images of the BD patients and control subjects were evaluated according to sacroiliitis MRI chronicity index to determine whether there is any pathology (Grade 0 and I were considered normally, Grade II, III, IV were considered pathological). There was sacroiliitis in eight of the (21.1%) patients with BD. Sacroiliitis was unilateral in six patients while it was bilateral in two patients. We found sacroiliitis in 7 (20%) of the subjects in the control group of whom six were unilateral and one of them was bilateral. We did not find a statistically significant difference between the two groups by means of sacroiliitis prevalence ($p > 0.05$).

The patients were divided into two groups regarding disease duration as ten years or longer and less than ten years, and groups were compared for sacroiliitis prevalence. There was no significant difference between the groups ($p > 0.05$).

Discussion

Sacroiliitis prevalence in BD was similar to the control group in the present study. According to our knowledge this is the first study in the literature investigating sacroiliitis prevalence in BD by MRI. In the literature, there have been contradictory results about frequency of sacroiliitis in BD [1, 3, 4, 8].

The highest frequency rate of sacroiliitis in BD was reported by Dilsen et al [3] as 63% in a series of 106 patients. However this high prevalence was not confirmed in following studies including controlled trials [1, 2, 4-6, 8, 12, 13]. The first controlled study designed by Yazıcı et al [4] found the sacroiliitis prevalence in BD detected by radiography as 35.1%, while this ratio in healthy controls was 21.8%. In another controlled study performed by Kotevoglou et al [6], sacroiliitis prevalence detected by radiography was reported to be 23.1% in BD and 14.2% in healthy controls. In the second step of this study CT was used for documentation of sacroiliitis and the ratios were reported to be as 5% and 7% respectively. The decrease in these ratios was explained by CT eliminated inflammatory sacroiliitis in the patients with equivocal sacroiliitis. At the same time sacroiliitis was stated not to be property of BD in that study. In the present study we found a higher prevalence of sacroiliitis both in BD and the controls. This may be related to the higher sensitivity of MRI compared to CT in diagnosis of sacroiliitis. Chang et al [1] and Chamberlain et al [2] have reported that the prevalence of sacroiliitis was not different than the controls. In an uncontrolled study performed by Tc-99m bone scintigraphy, sacroiliitis frequency in BD was found to be 25% [8]. The prevalence of sacroiliitis in BD was reported to be higher than that of the controls only in two studies in the literature [12, 13]. Dilsen et al [12] found the prevalence of sacroiliitis to be 33.8% in their later controlled study which was lower than their previous study. Sacroiliitis prevalence in the control group was reported to be 6.5% in Dilsen et al's study. Oliveri et al [13] further supported the significantly increased frequency of sacroiliitis in BD compared with the controls (30% in BD vs 5% in controls).

Different frequency ratios of sacroiliitis in BD reported in different studies can be due to the high interobserver variation in interpreting the images and different imaging

techniques. MRI and CT have almost equal efficacy superior to radiography in staging joint destruction as part of sacroiliitis but MRI in addition allows visualization and grading of active inflammatory changes in the joint space, subchondral bone, and surrounding ligaments. MRI can replace CT in cases with a strong clinical suspicion of sacroiliitis and equivocal or normal plain radiographs [9, 14]. Also interobserver variability in the interpretation of MRI was low compared to the CT [15]. Bone scintigraphy has limited diagnostic value for the diagnosis of established AS, including the early diagnosis of suspected sacroiliitis. Therefore MRI is preferable diagnostically in the evaluation of sacroiliitis [9]. According to the results of the present study and other studies the prevalence of sacroiliitis among BD patients varies approximately between 5% and 63%. Most of the studies in the literature have used radiographs for evaluation of sacroiliac joints [1-4, 12]. Three studies used CT [6, 7, 13], and another one used scintigraphy [8]. Despite the different frequency ratios with distinct evaluation methods; controlled studies other than that of Dilsen et al [12] and Oliveri et al [13] have shown that sacroiliitis frequency in BD is not higher than age and sex matched controls. Perhaps the high frequency ratios could be due to the association of the type of joint involvement with the clinical severity, duration of the disease, and genetic factors. There is not a related comment in the literature. We did not find a significant difference in sacroiliitis prevalence regarding disease duration. Unfortunately, the disease severity, and genetic factors were not evaluated in the present study. This is the weak point of our study.

In conclusion, according to the results of this study, sacroiliitis does not seem to be a characteristic finding for joint involvement in BD. Further controlled studies with larger number of patients are needed to show whether the severity and duration of disease is influential on the type of joint involvement.

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