BRUCELLA SEROLOGY IN PATIENTS WITH LOW BACK PAIN WITH MODIC TYPE II LESION

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ABSTRACT

Objective: *Modic lesions are common bone marrow and endplate changes that are visible on magnetic resonance imaging of the lumbar spine. They are generally classified into three types. Histological examinations have shown that type I (hypointensity on T1- and hyperintensity on T2-weighted images) consists of fibrovascular tissue, type II (hyperintensity on T1- and T2-weighted images) is lipid, and type III (hypointensity on T1- and T2-weighted images) is sclerotic bone. These lesions are associated with low back pain.*

Some studies have suggested that intradiskal bacteria might play a role in the pathophysiology of Modic lesions. Brucellar spinal involvement is mostly seen at lumbar level, and may cause destructive changes and bone sclerosis visible on spinal images. In this study, we aimed to evaluate the indication of serum brucella antibody titer investigation in patients with lumbar Modic type II lesion.

Material and Method: *This study was performed on patients with Modic type II lesion who applied to our outpatient rehabilitation clinic between May 2012 and October 2012. All patients were investigated for serum brucella antibody titer by Wright test. Also, the patients were questioned about their past medical history related to brucellosis.*

Results: *A total of 28 patients (mean age: 39.85; male/female: 12/16) with Modic type II lesion were included in this study. All patients were found to be negative for brucella serology and their past experiences related to brucellosis.*

Conclusion: *In our clinic, non-selective evaluation of brucella antibody levels was not found necessary fort he patients with low back pain with Modic type II lesion.*

Key Words: *Modic, brucella, serology.* ***Nobel Med 2014; 10(2): 55-58***

MODİC TİP II LEZYONU OLAN BEL AĞRILI HASTALARDA BRUSELLA SEROLOJİSİ

ÖZET

Amaç: Modic lezyonları, lomber omurganın manyetik rezonans görüntülemesinde görünen yaygın kemik iliği ve son plak değişiklikleridir. Bunlar genellikle üç tip olarak sınıflandırılırlar. Histolojik incelemeler tip I (T1 ağırlıklı görüntülerde hipointensite ve T2 ağırlıklı görüntülerde hiperintensite)'in fibrovasküler doku olduğu, tip II (T1 ve T2 ağırlıklı görüntülerde hiperintensite)'nin yağ içerdiğini ve tip III (T1 ve T2 ağırlıklı görüntülerde hipointensite)'ün sklerotik kemik olduğunu göstermiştir. Bu lezyonlar, bel ağrısı ile ilişkilidir.

Bazı çalışmalar, disk içi bakterilerin Modic lezyonlarının patofizyolojisinde bir rol oynayabileceğini ileri sürmüştür. Brusella'nın spinal tutulumu, daha çok bel seviyesinde görülür ve spinal görüntülerde görünen yıkıcı değişiklikler ve kemik skleroza neden olabilir. Bu çalışmada, lomber Modic tip II lezyonlu hastalarda serum brusella antikor titresini inceleme endikasyonunu değerlendirmeyi amaçladık.

Materyal ve Metod: Bu çalışma, Mayıs 2012 ile Ekim 2012 tarihleri arasında, ayaktan rehabilitasyon polikliniğimize başvuran Modic tip II lezyonlu hastalar üzerinde yapıldı. Tüm hastalar Wright testi ile serum brusella antikor titresi açısından incelendi. Ayrıca, hastalar brusella geçmişi hakkında sorgulandı.

Bulgular: Bu çalışmaya toplam 28 Modic tip II lezyonlu hasta (ortalama yaş: 39,85; kadın/erkek: 12/16) dahil edildi. Bütün hastaların, brusella serolojisi ve bruselloz geçmişi açısından negatif olduğu tespit edildi.

Sonuç: Kliniğimizde, Modic tip II lezyonu olan bel ağrılı hastaların, serum brusella antikor seviyeleri açısından non-selektif olarak incelenmesi gerekli bulunmamıştır.

Anahtar Kelimeler: Modic, brusella, seroloji

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INTRODUCTION

Modic lesions are bone marrow and endplate changes that are visible on magnetic resonance imaging (MRI) and are common MRI findings in the lumbar spine.[1] They are generally classified into three different types, however, these lesions can convert from one type to another in time.[2] In prevalence studies, Modic type II lesions have been detected to be predominant in the lumbar spine.[3]

On the histological examinations, it has been found that Modic type I lesions (hypointense signal on T1- and hyperintense signal on T2-weighted images) are associated with fibrovascular granulation tissue within the subchondral bone and correspond to vertebral body edema; type II lesions (hyperintense signal on T1- and either hyperintense or isointense signal on T2-weighted images) reflect fatty replacement of the adjacent marrow; type III lesions (hypointense signal on T1- and hypointense signal on T2-weighted images) are observed in vertebral bodies with sclerotic changes (Table 1).[1,2,4]

Brucellosis is a zoonotic disease caused by the small, non-motile, gram-negative coccobacillus. Serological examination is important for the diagnosis of brucellosis. The standard tube agglutination (Wright test) is the most frequently used test in serological examinations. This test measures the serum total IgG and IgM antibodies.[5] While the serum levels of IgM antibodies for brucellosis may remain low even years after infection, the persistence of IgG antibodies suggests resistant to infection or relapse.[6]

In this study, we aimed to investigate the serum brucella antibody titer in patients with low back pain with Modic type II lesion (Figure 1). The results of the study may explain whether there is a relation between brucellosis and Modic type II lesions. Also, the results may evaluate the indication of serum brucella antibody titer investigation in patients low back pain with Modic type II lesion.

MATERIAL and METHOD

This study was performed on patients with Modic type II lesion who applied to the outpatient rehabilitation clinic of Bitlis State Hospital between May 2012 and October 2012. The study protocol was approved by the local ethics committee of Bozok University Medical Faculty (Decision No: 9/5; Date: 04/04/2013). All patients gave their written informed consent before entering the study. In the study, all patients were investigated in terms of the serum brucella antibody titer by standard tube agglutination test. In addition to this laboratory investigation, the patients were questioned about their past medical experiences related to brucellosis.

RESULTS

A total of 28 patients (range 28 to 59 years; mean age: 39.85; male: 12, female: 16) with Modic type II lesion →

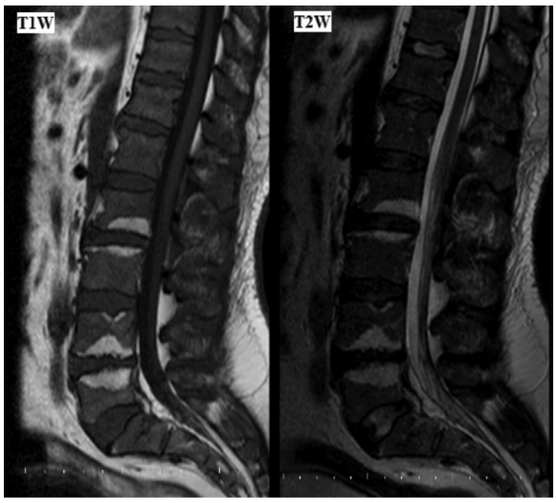

Figure 1: Magnetic resonance imaging of the lumbar spine in one of our patients, Modic type II lesions (hyperintensity on T1- and T2-weighted images) at the L2-L3 and L4-L5 disc levels

Table 1: Characteristics of Modic lesions

Modic Lesion	T1 Image	T2 Image	Histology
Type I	Hypointensity	Hyperintensity	Fibrovascular
Type II	Hyperintensity	Hyperintensity	Lipid
Type III	Hypointensity	Hypointensity	Sclerosis

were included in this study. All patients were found to be negative for brucella serology. Also, they stated that there were no experiences related to brucellosis in their past medical history.

DISCUSSION

Brucellosis is a serious public health problem in many developing countries including Turkey, and it can affect many organs and tissues. The clinical findings of brucellosis are protean and include rheumatic complaints in 20-85% of patients.[7] The spine is the most common region of musculoskeletal involvement, followed by the sacroiliac and large peripheral joints.[6,8] However, about 85% of patients with chronic brucellosis are asymptomatic, and symptoms are usually nonspecific.[9] Spinal involvement is seen mostly at the lumbar level, and destructive changes and reactive bone sclerosis may be observed in the involved vertebral bodies on the spinal radiological examinations.[6] Because of common spinal involvement, Sendur et al. have recommended that brucellosis should be considered in patients with chronic low back pain in endemic regions. [6]

Modic lesions are considered as a part of degenerative disc disease, and these lesions at L5-S1 level and especially type I lesions are strongly associated with low back pain.[1-3] Histological investigations have demonstrated that type I consists of fibrovascular granulation tissue, type II is yellow fat, and type III is sclerotic bone (Table 1).[1,2,4] However, underlying pathophysiological mechanisms for development of these lesions are still in debate.[4,10]

On the other hand, some studies have suggested that intradiscal bacteria in the spine might play a role in the pathophysiology of disk degeneration and Modic lesions.[11-13] In addition, different specific infectious, degenerative and immunological diseases such as osseous infections, osteoarthritis, ankylosing spondylitis and spondylarthritis can lead to subchondral bone marrow signal changes associated with pain.[4]

For reasons explained above, we wanted to investigate if there is a relation between brucellosis and lumbar Modic type II lesions which are more common than other types at the lower lumbar spine segments.[3,14] Also, we aimed to evaluate the indication of serum brucella antibody titer investigation in these patients. To our knowledge, this is the first study investigating the presence of brucellosis in patients with Modic lesion.

In the present study, brucella serology and medical brucellosis experiences were investigated in patients with low back pain with Modic type II lesion. As a result, all patients were found to be negative for brucella serology and past brusellosis experiences. Accordingly, the results of this study did not support an etiologic relationship between brucellosis and Modic type II lesions. Thus, we concluded that the evaluation of brucella serology was an unnecessary procedure in these patients. Hopefully, the results of our study will help to eliminate unnecessary expenses.

In agreement with our results, Oztekin et al. have determined that brucellar spondylodiscitis was hypointense and hyperintense in the acute stage, whereas it was hypointense and heterogeneous in the subacute and chronic stages on T1- and T2-weighted images, respectively.[15] Namely, Modic type II lesions (hyperintense on T1- and either hyperintense or isointense on T2-weighted images) were not observed at any period of brucellar spondylodiscitis. These findings corroborate the results of the present study.

This study has a few limitations. First, the study was performed with only patients with Modic type II lesion on their lumbar spine region.

For this reason, our findings may not be valid for other types of Modic lesions and lesions located at other →

spinal levels. Second, brucella serology was evaluated by Wright test in this study. However, this test may not be able to detect a treated and completely recovered past brucellosis. Therefore, the patients were questioned about their past medical experiences related to brucellosis to eliminate this limitation. Third, the number of patients were small included in the study. However, all patients were negative although their region was endemic for brucellosis.

CONCLUSION

In conclusion, the results of this study suggested that there was no etiologic link between brucellosis and Modic type II lesions. In our clinic, non-selective evaluation of brucella antibody levels was not found necessary fort he patients with low back pain with Modic type II lesion.

* The authors declare that there are no conflicts of interest.

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