

Concomitance of fibromyalgia syndrome and cervical disc herniation

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Abstract. [Purpose] Fibromyalgia syndrome (FMS) and cervical disc herniation (CDH) are a common diseases commonly encountered in physical therapy clinics. There are also patients who have both of these diseases. In this study we aim to investigated whether FMS is a risk factor for cervical disc herniation and the frequency of their coincident occurrence. [Subjects and Methods] Thirty-five patients having a primary FMS diagnosis according to the American Rheumatism Association criteria are taken into consideration and a control group were the subjects of this study. The two groups were compared with respect to cervical disc hernia using cervical region MRI. [Results] The distribution of disc hernia of 6 fibromyalgia patients who had cervical discopathy was: 16.6% C2–3, 16.6% C5–6, 16.6% C6–7, 33.3% C4–5, C5–6 (two levels in two patients) and 16.6% C4–5, C5–6, C7–1 (three levels in one patient) . The herniation directions were given as: central in 5 levels, right paramedian in 1 level, and left paramedian disc hernia in 1 level. There were 4 cervical disc hernia in the control group. The herniation direction were central in two, right paramedian in one, and left paramedian in one patient. [Conclusion] In this study, the existence of cervical disc herniation in fibromyalgia patients was found to be not different from the normal population.

Key words: Primary fibromyalgia syndrome, Cervical disc herniation, Fibromyalgia

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INTRODUCTION

Fibromyalgia syndrome (FMS) is a clinical presentation commonly seen in the middle age women, which is accompanied by psychosomatic complaints such as widespread pain and chronic fatigue along with sleep disorder or non-relaxing sleep, paresthesia and subjective swelling of the hands, migraine-type headache, irritable bowel syndrome and dysmenorrhea. Although musculoskeletal pains are generally localized in the neck, interscapular region and low back, they may also spread to the arm and to the chest. During the examination, objective findings other than sensitive points cannot be detected and laboratory analyses have normal results⁵⁾.

Most common reasons of the pain spreading to the neck and to the arm include cervical spondylosis and cervical root compression. Pains that result from the disc herniations located in the cervical region are generally radicular and they may be accompanied by neurologic deficits, such as loss of strength, paresthesia, reflex defect and atrophy^{2, 4)}. Moreover, in some cases, Raynaud-like swelling and vasomotor changes may be integrated in the clinical presentation^{1, 3)}.

Patients with fibromyalgia continuously present for a

visit and for the periodic controls with the complaints of neck, shoulder, arm, low back and knee pains. The patients resist to the therapy and they ask why they cannot be healed.

It may be very difficult to convince the patients to be treated. Some patients are not so happy despite all therapeutic methods and the doctors may hesitate about the diagnosis with some patients. A cervical MRI may be necessary to elucidate the patients and to eliminate our doubts in the patients that raised a hesitation. In both diseases, cervical and arm-shoulder pains are similar and the laboratory values are normal.

This study aims to determine the incidence of fibromyalgia-cervical disc herniation concomitance, to prevent a delay in the treatment of cervical disc herniation, if any, to inform the patients and to eliminate the question marks about the cervical disc herniation. In this study, it was investigated whether a concomitant cervical disc herniation existed in the patients diagnosed with primary FMS using MRI.

SUBJECTS AND METHODS

We enrolled a total of 35 patients presented to our polyclinic, who were diagnosed with primary FMS according to Diagnosis Criteria of American Rheumatism Association. Control group was compared with MRI of cervical region obtained from the subjects without neck pain. This group was consisted of 22 healthy controls.

All patients had anamnesis, systemic physical examination and routine laboratory analyses (biochemistry, CBC, thyroid function tests, urinalysis). Patient files were individually searched. The patients with secondary fibromyalgia

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were excluded from the study. All of our patients were questioned for age, gender, body weight and disease-related features. The cases, which showed neurologic findings such as loss of strength, reflex defect, atrophy and pathologic reflex, during the physical examination were not included in the study, despite FMS-consistent medical history. The patients who have been previously diagnosed with cervical discopathy were excluded from the study. Each patient had MRI. All MRIs were evaluated by the same person in the radiology department of our hospital. The patients with a MRI that showed bulging were considered as radiologically normal.

Our healthy controls included the subjects that have been previously adapted to the patient group and who have been already in our records. Our control group included our MRI records obtained from those without cervical pain. For the subjects of the control group, we did anamnesis and physical examination. Control group was questioned for age, gender, body weight and disease. The files of the control group were individually examined. As a result of these examinations, 8 healthy controls were excluded from the study because they did not meet our criteria.

Data for the patients and for the control group were presented as graphics. The results were analyzed using X2 test and statistically interpreted. Significance level was considered as $p=1.00$.

RESULTS

Of the patients, 34 (97.1%) were women and 1 (2.9%) was man. Overall mean age was 38.3 ± 6.8 , and mean age for the women was 38.2 (26–55) and for the men was 44 (44). Cervical disc herniation was detected in 6 of 35 patients with fibromyalgia (17.1%) (Table 3). Of the patient group, 28 were married, 6 were single and 1 was widow. Of the patient group, 26 were housewives, 6 were officers, 2 were retired and 1 was student. All patients with fibromyalgia, in whom cervical disc herniation was detected, were women. Their mean age was 40.

The distribution of disc herniation by the levels was as follows: 16.6% C2–3, 16.6% C5–6, 16.6% C6–7, 33.3% C4–5, C5–6 (two levels in two patients), 16.6% C4–5, C5–6, C7–T1 (three levels in one patient). In terms of herniation orientations, the disc herniation was central in 5 levels, right paramedian in 1 level and left paramedian in 1 level (Table 3).

The cases, in whom bulging was detected in MRI, were considered as normal and they were excluded from the analysis. Of the control group, 95% was women and 5% were male. In the control group, mean age was 36.00 ± 8.8 , being 35.9 for women and 37 for men. Of the control group, 16 were married and 6 were single (Table 1), and 7 were housewives, 10 were officers, 1 was student, 2 were retired, and 2 were self-employed (Table 2). In the healthy control group, 4 (18%) cervical disc herniation was detected (Table 5) and all of these 4 people were women. Their mean age was 42.75. The distribution of disc herniation by the levels was as follows: 25% C4–5, 75% C5–6. The orientation of the herniation was central in two, right paramedian in one and left paramedian in one (Table 4). As done in the patient

Table 1. Marital status of the patients and control groups

| Marital status | Patients group | | Control group | |
|----------------|----------------|-------------|---------------|-------------|
| | Number | Percent (%) | Number | Percent (%) |
| Married | 28 | 80 | 16 | 72.7 |
| Single | 6 | 17.1 | 6 | 27.3 |
| Divorced | 1 | 2.9 | - | - |
| Total | 35 | 100 | 22 | 100 |

Table 2. The distribution of the subjects according to their profession

| Profession | Patients group | | Control group | |
|------------|----------------|-------------|---------------|-------------|
| | Number | Percent (%) | Number | Percent (%) |
| Housewife | 26 | 74.2 | 7 | 31.8 |
| Free | - | - | 2 | 9 |
| Official | 6 | 17.2 | 10 | 45.6 |
| Retired | 2 | 5.7 | 2 | 9 |
| Student | 1 | 2.9 | 1 | 4.6 |
| Tradesman | - | - | - | - |
| Total | 35 | 100 | 22 | 100 |

group, the cases with herniation as bulging were excluded from the analysis.

$P=1.00$ (no statistically significant difference was detected between two groups in terms of the presence of cervical disc herniation).

DISCUSSION

Although the prevalence of fibromyalgia syndrome was 1–2% in the normal population, it was reported that the patients with FMS consisted 14–20% of the patient who were presented to the polyclinics of rheumatology. While the main complaints of the patients were chronic fatigue and pain especially localized in the neck, scapular, interscapular and low back regions, where muscular mass was concentrated, many patients might exhibit a presentation accompanied by several symptoms such as sleep disorder, anxiety or depression, headache, spastic cholestis and subjective swelling of the hands and paresthesia⁵.

Despite the studies conducted to date, etiology and pathophysiology of FMS have not been fully understood^{8,9}. In the tissue sample obtained from sensitive points of the trapezius muscle, light and electron microscopy revealed a substantial decrease of ATP, ADP and phosphocreatine, atrophied fibrils, lipid and glycogen changes and mitochondrial changes⁶. It was suggested that these changes were mainly due to decreased tissue blood supply and that the decrease of tissue blood supply was related to vicious cycle of pain-muscle spasm-pain^{10,11}.

Local tissue trauma (direct injury, sprain, emotional stress, exposure to cold, postural instabilities or a combination of these conditions) or recurrent occupational minor traumas are thought to play an important role in the formation of sensitive points⁷. Moreover, depression or anxiety disorders,

Table 3. Cervical disc herniation levels and directions in the patients group

| Patient no | C2-3 | C5-6 | C6-7 | C4-5 C5-6 C7-T1 | C4-5 C6-C7 | The direction of herniation |
|------------|------|------|------|-----------------------|---------------|--|
| 1 | + | | | | | Central |
| 2 | | | | | + | Anterior central C5-6 Left paramedian C6-7 |
| 3 | | | + | | | Anterior central |
| 4 | | | | + | | Anterior central |
| 5 | | | | | + | Anterior central |
| 6 | | + | | | | Right paramedian |
| Total | 1 | 1 | 1 | 1 | 2 | 6 |

Table 4. Cervical disc herniation levels and directions in the control group

| Control no | C4-5 | C5-6 | C6-7 | The direction of herniation |
|------------|------|------|------|-----------------------------|
| 1 | + | | | Right paramedian |
| 2 | | + | | Central |
| 3 | | + | | Central |
| 4 | | + | | Leftparamedian |
| Total | 1 | 3 | | 4 |

Table 5. Comparison of the cervical disc herniation of the in patients and control groups

| | Patients group | Control group |
|------------------------------|----------------|---------------|
| Cervical disc herniation (+) | 6 (% 17.1) | 4 (% 18) |
| Cervical disc herniation (-) | 29 (% 82.9) | 18 (% 82) |
| Total | 35 (% 100) | 22 (% 100) |

which are seen in a considerable part of the patients, cause the collapse of shoulder's elevator muscles (levator scapula, rhomboids) and increased dorsal kyphosis. As a result, elevator muscles continuously remain under stress beyond physiological limits. C fibers that play a role in the formation of the pain may be easily cleaved and become painful in the presence of tension and ischemia. Even if the factor or factors that promote the event are eliminated, sensitive points may be permanent⁷⁾.

Among the causes of the pain that spreads to neck-back and arm, one of the most commonly seen diseases is cervical disc herniation (CDH)^{12, 13)}. CDH mostly leads to radicular pain, dermatomal paresthesia and neurologic deficit. In some cases, pain and sensory impairment cannot be precisely localized due to more than one root innervations and variations. In these cases, pain that refers to the neck, scapular region, interscapular region, shoulder and the proximity of the arm and paresthetic complaints in the distal of the extremity are observed^{1, 12, 14, 15)}. Stimulation of the dorsal sensorial part of the nerve root causes neurogenic pain, whereas the stimulation of the ventral motor part leads to myogenic pain. In the other words, while the irritation of the dorsal region mostly causes electric shock-like pain in the periphery of the extremity and paresthesia, the pains resulting from the irritation of the ventral motor region have mainly proximal localization and they are felt in the scapula, shoulder and in the proximity of the arm^{1, 3)}. Moreover, occasionally, chest pain (atypical angina), pain in the breast tissue and the pains spreading to the face may be atypically observed. These types of pain and paresthesias that don't show a particular localization may also be encountered in the patients with FMS.

The mechanism of the pains that occur in the presence of disc herniation has not been fully understood^{1, 3)}. It was seen that mechanic pressure applied on the nerve in vitro did not lead to pain, whereas local ischemia and nerve traction caused pain. According to an alternative insight, it was claimed that the pain observed in CDH resulted from irritation-related reflex muscle spasm rather than nerve root compression or irritation¹⁾. Ultimately, fibromyalgia and cervical disc herniation have some common symptoms. Therefore, one disease may mask the other and the accurate diagnosis may be overlooked. In this regard, it was reported that some patients with FMS unnecessarily underwent cervical or carpal tunnel decompression via surgical intervention^{3, 20)}.

Long-term vicious cycle of pain-spasm-pain may play a role as a possible factor in the worsening and in the chronicization of the symptoms in FMS, by impairing physical and psychologic structure of the person over time. It is also possible to observe vice versa. In other words, cervical lordosis, which occurs to balance thoracic kyphosis increased during FMS, causes narrowing of the intervertebral foramina, compressed nerve roots and loading on facet articulations, and thereby, triggers the formation of CDH.

We conducted this study to investigate whether the patients with treatment-resistance FMS had concomitant CDH. There was no statistically significant difference between two groups (Fischer χ^2 p=1.00). The results obtained in both groups were parallel to each other.

Boden et al. conducted a study on 63 volunteer people without any cervical complaints and they reported that they detected abnormal findings at a rate of 19% on cervical MRI (disc herniation, bulging, foraminal stenosis, disc space narrowing, osteophytes, cord compression etc.) and that the rate of abnormality was increased with advanced age.

In this study, the volunteers were randomly selected and

the subjects with cervical abnormality were not excluded by previously detecting them using x-ray¹⁶). Lundsford reported in his series of 334 cases the presence of CDH at a rate of 48% at C5/6 level and at a rate of 37% at C6–7 level¹⁹).

The studies performed showed that MRI provided quite sensitive and accurate results in the diagnosis of the disc herniation. However, it should be kept in mind that clinical findings and radiologic findings are not always correlated in these patients and, moreover, imaging methods may give false-positive or negative results^{17, 18}). Bischoff et al.²¹) used pre-operative computerized tomography-myelography (CT-myelo), MRI and myelography in 57 patients to detect the sensitivity, the specificity and the precision of SDH. They reported that, although the comparison of the surgical results suggested CT-myelography to be the most sensitive and reliable method, MRI results were as important and reliable as CT-myelography. Moreover, they suggested that MRI was superior in previously operated cases and that MRI should be preferred in many cases due to its non-invasiveness and its nature that does not contain radiation.

Lehto et al.²²) examined cervical area of 89 asymptomatic subjects aged between 9 and 63 years-old using MRI. They noted that the subjects aged above 40 years-old had 62% more abnormal findings, that there was no noticeable difference between women and men, and that abnormal findings were more numerous at the level of C5/6.

Humphreys et al.²³) evaluated the cervical area in 56 people among symptomatic and asymptomatic individuals aged between 20 and 60 years-old and they obtained a cervical MRI. C4–5, C5–6, and C6–7 distances, lordosis changes, disc heights and spinal diameters, foraminal heights and widths were measured and the results were evaluated. It was noted that the foraminal heights and widths were greater in the symptomatic, the hypertrophic areas of the inferior facet tended to be decreased in elderly and there was no difference in terms of disc heights, lordosis, spinal cord and spinal tract diameter.

Heffez et al.²⁴) investigated the concomitance of cervical myelopathy in a study conducted on the patients diagnosed with FMS. Of the patients, 87% were women; mean age was 44 and mean duration of disease was 8 years. In this series of 270 patients, 46% of the patients showed spinal stenosis and 20% had Chiari 1 malformation. As the symptoms and the findings of the patients were similar to fibromyalgia characteristics, detailed neurologic examination was proposed.

Buskila et al.²⁵) investigated the incidence of fibromyalgia in 161 patients with trauma. Among these patients, 102 had cervical trauma and 59 had lower extremity trauma. While FMS developed in 21% of the patients 3.2 months after the cervical trauma, it developed in 1.7% of the patients with lower extremity trauma. As a result, the likelihood of FMS development after a neck trauma was found to be higher compared to the likelihood of FMS development after the lower extremity trauma.

At the end of 3 years, Neumann et al.²⁶) re-evaluated the patients with FMS developed following a cervical trauma. Of 20 patients (11 women and 9 men) who have been diagnosed with FMS following a trauma three years ago, 12 were re-evaluated as FMS, of which 11 were women and 1 was a man. Consequently, it was reported that the likelihood of

sustained post-traumatic fibromyalgia was high in women.

During our study, among nearly 60 patients who were presented with widespread pain, to whom we put the diagnosis of primary and secondary fibromyalgia, 10 patients had already had a cervical MR at the time of presentation. This demonstrated that the patients with fibromyalgia were not so satisfied and therefore, approximately 10% of these patients had a cervical MR.

In the literature, we could not detect a study similar to ours. The samples that we compared rather included the samples for post-traumatic fibromyalgia syndrome. Consequently, at least in some part of the cases with treatment-resistant FMS, the likelihood of a coexistent cervical disc herniation should not be ruled out and a detailed anamnesis and physical examination should be performed.

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