

Frequency of neuropathic pain in patients with shoulder pain

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Abstract. – OBJECTIVE: Shoulder pain is one of the most common musculoskeletal disorders in general population. Although shoulder pain is completely resolved within one year after treatment in more patients, persistent pain is observed in remaining patients. Neuropathic pain may play a role in persistent shoulder pain in some patients. The aim of the study was to investigate the neuropathic pain component in patients with shoulder pain.

PATIENTS AND METHODS: 49 patients with shoulder pain were enrolled in this study. The Pain-Detect questionnaire was used to determine the presence of neuropathic pain. Visual analogue scale (VAS) was used to evaluate shoulder pain. Quick Disabilities of the Arm, Shoulder and Hand (Quick-Dash) was used to determine to measure physical function and symptoms.

RESULTS: The neuropathic pain component in patients with shoulder pain was 20% and possible neuropathic pain was 19% according to Pain-Detect questionnaire. The mean VAS score, Quick-Dash score and symptom duration were significantly higher in the neuropathic pain group.

CONCLUSIONS: The patients with shoulder pain have a neuropathic pain component. We suggest that neuropathic pain should be assessed when prescribing treatment programs in patients with shoulder pain.

Key Words:

Neuropathic pain, Shoulder, Pain-Detect questionnaire.

Introduction

Shoulder pain is a common musculoskeletal problem in the general population, with a prevalence of 7-26%. It is the third most common musculoskeletal disease after low back and neck pain. 90-95% of shoulder pain is due to periarticular causes. These clinical pictures include rotator cuff lesions, adhesive capsulitis, acromioclavicular joint degenerations, calcific tendinitis, glenohumeral joint osteoarthritis. These are the most common rotator cuff lesions^{1,2}. The aim of the treatment of shoulder pain is to reduce the inflammatory response, to

provide full range of motion, to increase shoulder functions and to obtain a pain-free shoulder. Most shoulder patients are treated conservatively, but some patients may experience persistent shoulder pain that persists for many years^{3,4}.

Most of the pain in the musculoskeletal system is nociceptive pain caused by mechanical stimulation and inflammation. In recent years, it has been shown that neuropathic pain component is also present in many pathological conditions that cause nociceptive pain^{5,6}. In various studies, it has been shown that neuropathic pain accompanies in rheumatic diseases such as knee osteoarthritis, low back pain, rheumatoid arthritis and ankylosing spondylitis⁵⁻⁸. Neuropathic pain is a burning, stinging, throbbing, tingling and numbing pain that occurs due to pathological changes in the pathways that transmit pain and sensitivity^{5,9}. There is no gold standard method for the diagnosis of neuropathic pain. Therefore, the first step in the evaluation is to distinguish neuropathic pain from other pain types. For this purpose, neuropathic pain questionnaires are frequently used. In recent years, many screening questionnaires for neuropathic pain have been developed and validated. Neuropathic pain is typically severe and slow to heal. Pharmacological and non-pharmacological treatment methods are used in the treatment of neuropathic pain⁹.

Few studies have been conducted in the literature on the presence of neuropathic pain in patients with shoulder pain, and the frequency of neuropathic pain and central sensitization has been investigated only in patients with rotator cuff tears and surgical repair^{10,11}. In this study, we planned our study to investigate the presence of neuropathic pain in patients with shoulder pain.

Patients and Methods

In our study, patients who applied to our physical therapy and rehabilitation outpatient

clinic with shoulder pain lasting longer than 3 months were evaluated. Those who had shoulder surgery, cervical disc disease, upper extremity entrapment neuropathy, polyneuropathy, diabetes mellitus, those who received shoulder physical therapy and steroid injection in the last 3 months, and those who received neuropathic pain treatment were not included in the study. A total of 49 patients who met the study criteria were included in the study.

The severity of the patients' current shoulder pain was evaluated with the visual analog scale (VAS). While making the evaluation, a 10 cm long line was drawn, and this line was numbered at 1 cm intervals. It was explained that 0: painless and 10: the most severe pain, and the patient was asked to mark the value for his pain on the scale. Pain at rest and activity were recorded. The arm, shoulder, and hand problems quick questionnaire (Quick-Dash) was used to evaluate the symptom severity and functional capacity of the patients. Measurement results scored between 0-100 points in the Quick-Dash questionnaire are obtained, a high score indicates a high disability level. Pain-Detect neuropathic pain questionnaire was used to evaluate the presence of neuropathic pain in the patients. The questionnaire was first developed in order to detect the neuropathic component of pain in patients with low back pain. It is a questionnaire consisting of 12 items questioning the character, course and radicular nature of pain. Patients with a total questionnaire score of 12 or less are considered to have no neuropathic pain. If the total score is in the range of 13-18, the result is uncertain, but neuropathic pain may be present, while scores of 19 and above are considered to have neuropathic pain. The Turkish validity and reliability study of the questionnaire was performed by Alkan et al¹². VAS resting and VAS activity values of the patients, Pain-Detect Questionnaire for neuropathic pain, Quick-Dash questionnaire to evaluate symptom severity and functional capacity were evaluated by the same person. The study was approved by the Local Ethics Committee of Kayseri Training and Research Hospital. Voluntary consent forms were obtained from all patients.

Statistical Analysis

While evaluating the data obtained in the study, SPSS for Windows, Version 16.0 for statistical analysis (SPSS Inc. Chicago, IL, USA. Released 2007) program was used. Results were

given as ratio, mean and standard deviation. Chi-square test was used for qualitative data. Independent *t*-test was used for quantitative data showing parametric distribution in comparison between groups, and Mann-Whitney U test was used for quantitative data showing nonparametric distribution. Statistical significance level was accepted as $p < 0.05$.

Results

A total of 49 patients were evaluated in the study. In the shoulder magnetic resonance evaluations of the patients, 26 patients had rotator cuff rupture, 9 patients had tendinosis and impingement findings, 6 patients had degenerative changes in the acromioclavicular joint, 5 patients had findings in favor of adhesive capsulitis, and 3 patients had calcific tendinitis. Neuropathic pain was detected in 10 patients (20%) with a Pain-Detect score of 19 and above. While probable neuropathic pain was found in 9 patients (19%), neuropathic pain was not detected in 30 patients (61%). Demographic data and clinical parameters of all patients are given in Table I. When the clinical parameters of the patients with and without neuropathic pain were compared, no statistical difference was found in terms of age in both groups. There was a statistical difference between the two groups in terms of gender. Female gender was higher in the neuropathic pain positive group ($p < 0.05$). A statistically significant difference was found between the two groups in terms of symptom duration, Quick-Dash score, VAS resting and VAS activity values ($p < 0.05$) (Table II). While the mean duration of symptoms was 25.2 ± 14.64 months in the group with positive neuropathic pain, it was 9.67 ± 8.09 months in the group without neuropathic pain ($p = 0.001$). Quick-Dash disability score, VAS rest and VAS activity values were found to be statistically significantly higher in the group with neuropathic pain.

Discussion

In our study, in which we investigated the presence of neuropathic pain in patients with shoulder pain, we found neuropathic pain at a rate of 20%, and we found the symptom duration to be significantly longer in our patients with neuropathic pain.

Shoulder pain can usually be treated non-operatively, but in half of the patients, the pain persists for many years and surgery is performed. The superiority of surgical treatment over conservative treatment was not found in studies. Patients who do not improve in 1 year despite conservative treatment are usually sent to surgery³. Central hypersensitivity and neuropathic pain formation in patients with persistent pain despite long-term treatments may be responsible for this situation. By determining whether neuropathic pain accompanies patients with shoulder pain, treatment arrangements can be made, and patients can benefit from it. Pathological neuronal stimuli originating from the joint and surrounding tissues cause complex changes called central sensitization in the central nervous system. In the case of central sensitization, nociceptive stimulation increases and hyperexcitability occurs. Symptoms such as pain in the form of electric shock, sensory abnormalities, hyperalgesia, allodynia occur. Central sensitization and neuropathic pain have been detected in populations such as chronic whiplash injury, fibromyalgia, carpal tunnel syndrome, osteoarthritis, tension-type headache, temporomandibular joint pain, knee osteoarthritis, and low back pain. Central sensitization in shoulder pain and the pathogenesis of neuropathic pain are not fully explained. Inflammation in shoulder pain may initiate damage to neural mechanoreceptors and suprascapular nerve, which may cause neuropathic pain^{13,14}.

There are very few studies in the literature investigating the presence of neuropathic pain in shoulder pain. Karasugi et al¹⁰ investigated the presence of neuropathic pain in patients with rotator cuff tears and found neuropathic pain positive in 10.9% of patients and probable neuropathic pain in 30% using the Pain-Detect questionnaire. In another study, Sangbong et

Table I. Demographic data of all cases (n=49, mean \pm SD).

Age	53.4 \pm 13.7
Gender (Female / Male)	31 (63%) / 18 (37%)
Symptom duration (months)	13.2 \pm 10.8
Quick-DASH	81.71 \pm 15.42
VAS \dot{I}	37.96 \pm 26.84
VAS A	75.10 \pm 21.41
Neuropathic pain (+)	10 (20%)
Neuropathic pain (-)	30 (61%)
Possible neuropathic pain	9 (19%)

Quick-DASH: Quick Disabilities of the Arm, Shoulder and Hand; VAS: Visual analogue scale; VAS \dot{I} : VAS resting; VAS A: VAS activity.

al¹¹ found neuropathic pain at a rate of 15.8% in patients who underwent surgical repair due to rotator cuff tear. In our study, using the Pain-Detect questionnaire, we found neuropathic pain positive in 20% and probable neuropathic pain in 19% of patients. The lack of a gold standard for the diagnosis of neuropathic pain leads to difficulties in making the diagnosis. Therefore, the first step in the evaluation is to distinguish neuropathic pain from other pain types. In recent years, screening questionnaires have been developed and validated to distinguish and evaluate neuropathic pain from other pain types. The Pain-Detect questionnaire is an evaluation questionnaire consisting of 12 items questioning the character, course and radicular nature of pain. In a study evaluating the adaptation, validity and reliability of the Pain-detect questionnaire in subacromial pain syndrome, the questionnaire was found to be reliable³. In our study, we found the rate of neuropathic pain to be slightly higher than in other studies. We think that this may be because we evaluated the frequency of neuropathic pain not only in patients with a rotator cuff tear or undergoing

Table II. Data of patients with neuropathic pain (NA+) and without neuropathic pain (NA-).

	NA + (n=10)	NA - (n=30)	p-value
Age	50.5 \pm 15.9	58.1 \pm 12.6	0.1
Gender			0.04
Female	9	16	
Male	1	14	
Symptom duration (months)	25.2 \pm 14.64	9.67 \pm 8.09	0.001
Quick- DASH	92.6 \pm 15.29	79.35 \pm 15.49	0.03
VAS \dot{I}	61.0 \pm 28.46	29.0 \pm 23.54	0.002
VAS A	93.0 \pm 11.59	70.67 \pm 23.62	0.008

Quick-DASH: Quick Disabilities of the Arm, Shoulder and Hand; VAS: Visual analogue scale; VAS \dot{I} : VAS resting; VAS A: VAS activity.

surgery, but also in patients with shoulder pain. In our study, we found that the VAS resting and VAS activity values and symptom duration were significantly higher in the group with neuropathic pain. Similar to our study, Karasugi et al¹⁰ found a correlation between VAS values and neuropathic pain. In our study, we also evaluated the symptom severity and functional capacity of the patients and found the disability rate to be high in the neuropathic pain group. The limitation of our study was the small number of patients and the length of the symptom duration.

Conclusions

In our study, in which we evaluated the frequency of neuropathic pain in shoulder pain, we found neuropathic pain at a rate of 20%. We think that in patients with persistent shoulder pain that does not improve with conservative treatments, an appropriate treatment plan should be made by considering the possibility of neuropathic pain.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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None.

Informed Consent

The authors declare that the patients included in the study signed informed consent forms to use their medical information in the studies.

Ethical Committee Approval

The study was approved by the Local Ethics Committee of Kayseri Training and Research Hospital.

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