COMPARISON OF PHYSICAL THERAPY AND PERIARTICULAR TENOXICAM INJECTION IN SUBACROMIAL IMPINGEMENT SYNDROME

OMUZDA SIKIŞMA SENDROMUNDA FİZİK TEDAVİ VE EKLEM ÇEVRESİ TENOXICAM ENJEKSİYONU ETKİNLİĞİNİN KARŞILAŞTIRILMASI

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ABSTRACT

Aim: The aim of this study was to compare with effectiveness of physical therapy and periarticular Tenoxicam injection in the patients with shoulder impingement syndrome.
Methods: Forty patients with shoulder pain for less than 6 months who were diagnosed with clinical and radiological evidence of subacromial impingement syndrome were included. Patients were randomly divided into 2 groups. The 20 patients in group 1 received 10 sessions physical therapy (hot-pack, Ultrasound (US), Transcutaneous Electrical Nerve Stimulation (TENS)) and those in group 2 received one periarticular 20 mg/2 ml Tenoxicam injection. All patients were instructed to perform Codman's pendulum exercises during the study. Shoulder pain during rest and activity by visual analog scale (VAS), range of motion (ROM) measurements and Shoulder Disability Questionnaire (SDQ) were used as outcome measures. The evaluations were done before the treatment and at the 1st, 2nd and 6th week after the treatment.
Results: The improvement in the pain scores during the rest and activity at the end of 1st week was not significant in group-1 ($p>0.05$), whereas it was statistically significant in group-2. The improvement in shoulder ROM and SDQ scores was significant in group-1 at all follow-up assessments ($p<0.05$). A significant improvement of ROM and SDQ scores in group-2 was found only at 1st week ($p<0.05$), while measurements of 2nd and 6th weeks were not different from 1st week and each other ($p>0.05$). There was not a statistically significant difference between two groups in terms of measurements of shoulder ROM and SDQ scores ($p>0.05$).
Conclusion: Periarticular Tenoxicam injection is a safe, rapidly acting, well-tolerated and cost-effective treatment alternative.
Key words: Subacromial impingement syndrome, periarticular Tenoxicam injection, physical therapy, rehabilitation

ÖZET

Amaç: Bu çalışmanın amacı omuz sıkışma sendromu olan hastalarda fizik tedavi ve tenoxicam enjeksiyonunun etkinliğini karşılaştırmaktı.
Metodlar: Klinik ve radyolojik olarak subakromial sıkışma sendromu tanısı alan ve 6 aydan kısa süredir omuz ağrısı olan 40 hasta çalışmaya alındı. Hastalar rastgele olarak iki gruba ayrıldı. Birinci gruptaki 20 hastaya 10 seans fizik tedavi (hot pack, ultrason ve TENS), ikinci gruba ise eklem çevresine 20 mg/2 ml Tenoxicam enjeksiyonu uygulandı. Tüm hastalara çalışma boyunca Codman's pendulum egzersizleri öğretildi. Görsel analog skala (VAS) ile omuz ağrısı şiddeti, eklem hareket açıklığı (ROM) ölçümleri ve Omuz Özürlülük Sorgulaması (SDQ) kullanıldı. Sonuç değerlendirmeleri tedavi öncesi ve tedaviden 1, 2 ve 6 hafta sonra yapıldı.
Bulgular: İstirahat ve hareketle ağrıda 1. haftada Grup2'de anlamlı düzelme görülürken, Grup1'deki düzelme anlamlı değildi. Omuz eklem hareket açıklığı ve Özürlülük sorgulama anketi skorları Grup 1'de tüm takiplerde anlamlı düzelme gözlendi, ancak Group 2'de sadece 1. haftadaki düzelme anlamlı idi, 2. ve 6. haftalarda 1. haftadan farklı değildi($p>0.05$). İki grup arasında eklem hareket açıklığı değerleri ve Özürlülük skorları açısından anlamlı fark yoktu. ($p>0.05$).
Sonuç: Eklem çevresine Tenoxicam enjeksiyonu güvenli, hızlı etkili, iyi tolere edilen ve düşük maliyetli bir tedavi alternatifidir.
Anahtar kelimeler: Subakromiyal sıkışma sendromu, eklem çevresi tenoxicam enjeksiyonu, fizik tedavi, rehabilitasyon.

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INTRODUCTION

Shoulder is the most mobile articulation of the body. It has a complex structure including muscles, tendons, bones and neurovascular formations. Therefore, many intrinsic and extrinsic factors may cause shoulder pain (1). The most common reason of painful shoulder is the subacromial impingement syndrome (SIS). This syndrome is occurred secondary to the impingement and inflammation of the supraspinatus tendon, subacromial bursa and soft tissues between the humeral head and structures that make up the coraco-acromial arch (2, 3). Neer (4) has defined 3 stages for subacromial impingement syndrome: Stage 1: edema and hemorrhagia of rotator cuff and bursa; Stage 2: fibrosis and tendinitis of rotator cuff; Stage 3: partially or complete tears of rotator cuff. Treatment of Stage 1 and Stage 2 is conservative (rest, nonsteroidal antiinflammatory (NSAI) drugs, therapeutic exercises and physical therapy). These patients benefit dramatically from local steroid or anesthetic injections (5). NSAI drugs are not generally preferred for local injection because of local irritation potential. Tenoxicam, a thienothiazine derivative of the oxicam class of NSAIDs, is a long-acting agent which has an analgesic and anti-inflammatory effect (6). The aim of this study was to evaluate the effects of periarticular tenoxicam injection in the patients with SIS and to compare the results with physical therapy.

MATERIAL and METHODS

Participants

Forty patients, referred to outpatient PM&R clinic of Ankara Education and Research Hospital with shoulder pain from March 2003 to September 2005 were included in this study. Inclusion criteria were: 1) shoulder pain lasting 6 weeks 2) subacromial impingement syndrome which was established by clinical tests and magnetic resonance imaging (MRI). Patients with Zlatkin Stage III (8) MRI findings were not included. Subjects with systemic metabolic diseases (diabetes mellitus, thyroid disease, chronic inflammatory disease etc.), cervical spondylosis or disc lesions, lung and cardiac disease were excluded. The procedure was explained and written informed consent was taken from all patients. This study was approved by the ethics committee of our hospital. No sponsored by any company were taken.

Intervention

An assessor-blinded, randomized controlled design was used. All assessments were performed by the same investigator who was blinded for the treatment assignment.

MRI was ordered for the patients who had painful arch test and impingement sign as described by Neer (7). Patients were randomized using a random-number list and allocated to two groups (Figure 1).

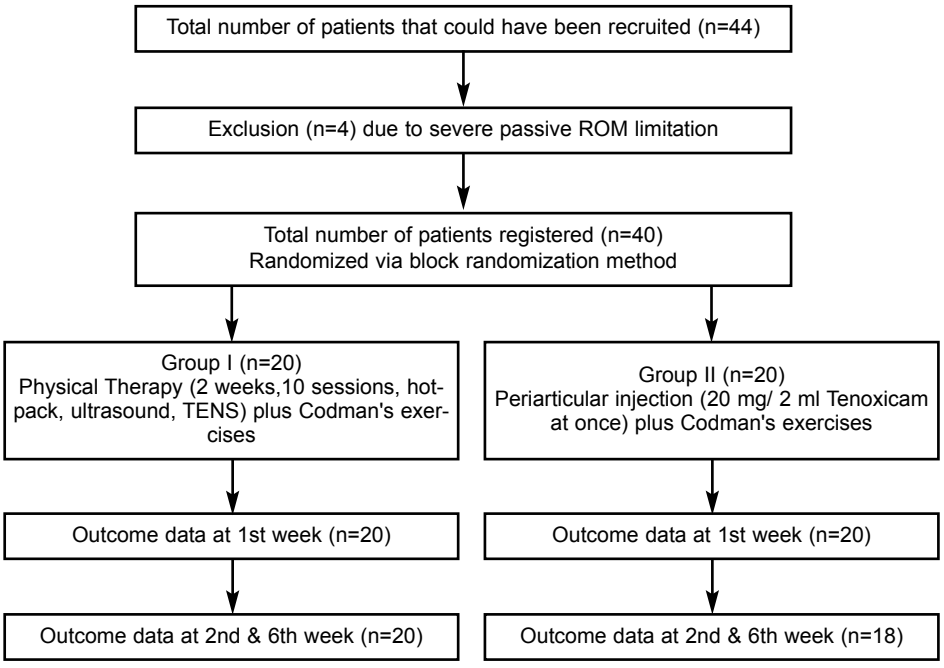

Figure-1: Flow diagram for randomized subject assignment in this study.

Twenty patients in Group-1 received physical therapy for 2 weeks (10 sessions) (hot-pack, ultrasound, transcutaneus electrical nerve stimulation). Twenty patients in Group-2 received one injection of 20 mg/ 2 ml tenoxicam by anterior approach technique. All patients were instructed to perform Codman's exercises in treatment period.

The evaluation of the patients was performed before the treatment, at the 1st, 2nd and 6th, week of treatment onset. Shoulder pain during rest and activity with a visual analog scale (10 point of VAS), range of motion of shoulder girdle (active abduction-flexion-internal rotation-external rotation) was evaluated by using a manual goniometer. The Shoulder Disability Questionnaire (SDQ) was used to assess functional status. The SDQ is a pain related disability questionnaire, which contains 16 items describing common situations that may induce symptoms in patients with shoulder disorders within the last 24 hours (9).

Tablo-I

Demographic characteristics of the patients in both groups.

	Group I (n=20)	**Group II (n=20)**
Sex (M/F %)	12/8 (40/60)	8/12 (60/40)
Age (years)	42.3 ±10.2	41.1±10.5
Disease duration (months)	5.35±4.2	4.9±3.9
	Group I (n=20)	**Group II (n=20)**
Sex (M/F %)	12/8 (40/60)	8/12 (60/40)
Age (years)	42.3 ±10.2	41.1±10.5

Tablo-II

Comparison with baseline and post-treatment values of the patients in both groups.

		Groupl (n=20)	**Group II (n=20)**	**P**
Pain at rest	baseline	6,45± 2,0	6,65± 1,7	<0,05
	1.week	6,25± 2,0	6,15± 1,4*	**0,025**
	2.week	4,45 ± 1,7 †	5,30± 1,3 †	<0,05
	6.week	4,05± 1,5‡	4,40± 1,3‡	<0,05
Pain on activity	baseline	7,15± 2,0	6,70± 1,8	<0,05
	1.week	6,90± 1,7	4,90± 2,1*	**0,037**
	2.week	4,75± 1,8 †	5,25± 1,8 †	<0,05
	6.week	3,40± 1,9‡	3,55± 2,1‡	<0,05
Active ROM degrees abduction	baseline	113,2± 35,5	110,0± 36,7	<0,05
	1.week	133,2± 30,1*	126,7± 37,5*	<0,05
	2.week	140,2± 28,7 †	132,0± 34,6 *	<0,05
	6.week	141,2± 28,1‡	133,0± 34,7*	<0,05
flexion	baseline	125,0± 44,5	121,0± 46,0	<0,05
	1.week	142,5± 32,7*	135,5± 39,8*	<0,05
	2.week	144,2± 31,5 †	147,7± 31,8 *	<0,05
	6.week	145,0± 30,4‡	148,2± 31,0*	<0,05
internal rotation	baseline	39,50± 5,8	38,50± 6,1	<0,05
	1.week	41,25± 4,8*	39,25± 6,1*	<0,05
	2.week	42,25± 4,1†	41,50± 4,8 *	<0,05
	6.week	43,00± 2,9‡	42,50± 4,1*	<0,05
external rotation	baseline	38,50± 6,5	36,50± 7,6	<0,05
	1.week	41,25± 4,2*	39,25± 5,4*	<0,05
	2.week	41,75± 4,0 †	40,75± 4,6 *	<0,05
	6.week	42,25± 3,4‡	41,25± 4,2*	<0,05
SDQ	baseline	49,78± 27,9	47,28± 25,3	<0,05
	1.week	46,52± 28,7*	42,81± 23,2*	<0,05
	2.week	36,45± 26,1 †	38,12± 24,2 *	<0,05
	6.week	32,29± 25,1‡	32,50± 25,1*	<0,05

* p<0,05 (changes from the baseline)
† p<0,05 (changes between 1st and 2nd week)
‡ p<0.05 (changes between 2nd and 6th week)

Statistical analysis

We analyzed the data using SPSS for Windows version 13.0. Groups were compared at baseline using the t test for independent samples. As all outcome variables were normally distributed, to test the study hypothesis we choose ANOVAs with repeated measures with a between-subject factor at 2 levels (the 2 groups) and a within-subject factor at 4 levels (the time: baseline, 1st week, 2nd week and 6th week of post-treatment).

RESULTS

Demographic and clinical characteristics as well as baseline comparisons of the groups are presented in Table 1. In total 40 participants were enrolled in the study (20 men, 20 women; 41.7±10.3 years; range 23-62 years). The mean duration of disease was 5.1±4.0 months (range 1-18 months). Baseline comparisons revealed that age, gender and disease duration did not differ between the groups ($p>0.05$). The improvement in the pain scores during the rest and activity at the end of 1st week compared to baseline was not significant in group-1 ($p>0.05$), whereas it was statistically significant in group-2 ($p=0.025$ for rest pain and $p=0.037$ for activity pain). The improvement in shoulder ROM (abduction, flexion, internal and external rotation), was significant at all assessments in group-1 ($p<0.05$). A significantly improvement of ROM in group-2 was found at 1st, 2nd and 6th week from the baseline ($p<0.05$), but measurements of 2nd and 6th weeks were not different from 1st week and each other ($p>0.05$). Both groups recovered significantly in SDQ scores ($p<0.05$). There was not a statistically significant difference between two groups in terms of measurements of shoulder ROM and SDQ scores ($p>0.05$) (Table 2).

DISCUSSION

This study reveals that both treatment options were effective in patients with shoulder impingement syndrome. However, injection therapy had a more rapid effect than physical therapy however, physical therapy was a long term effective treatment alternative. Several studies have shown that the results of operative and conservative treatment of shoulder impingement without structural defects do not differ substantially (10-12). The outcome comparisons of conservative treatment choices such as conventional physiotherapy, self-training, and shoulder brace (13) as well as local corticosteroid injections (14-17) were also not statistically different.

In a recent trial of comparison with intraarticular steroid and physiotherapy in shoulder capsulitis, it was found that corticosteroid injection was effective in improving shoulder-related disability while physiotherapy was effective in improving range of motion at 6 weeks after treatment (18). Carette et al observed that a single intra-articular corticosteroid injection combined with a simple home exercise program and physiotherapy was the faster effective than alone physiotherapy in the treatment of adhesive capsulitis (19). There are controversies in the literature regarding the benefits of of subacromial, periarticular or intra-articular steroids (20). Repeated corticosteroid injections are associated with accelerated deterioration of the joint due to cartilage breakdown or weakening of the tendon with tendon rupture (21). The main issues at this point may be safety, tolerability, and cost-effectiveness. It is well-known that physical therapy is a high-cost therapy depending on the cost of the physical therapy agents, the charges of physical therapist, and the loss of working hours compared to the injection therapy.

We found that periarticular tenoxicam had similar efficacy with physical therapy in shoulder impingement syndrome. Both treatments were well-tolerated and no adverse effects were recorded. The patients in injection group showed more rapid improvement in pain score of VAS while improvement in the physical therapy group started later but continued longer. The analgesic effects and well-tolerability of intra-articular tenoxicam were reported in the knee osteoarthritis (22) and after the knee arthroscopy (23, 24). So, we suggested that periarticular tenoxicam injection may be an alternative to corticosteroid injection and physical therapy because of low-cost, efficacy, safety, and tolerability. There was only one placebo-controlled study about periarticular injection of tenoxicam for painful shoulders (25). Itzkowitch et al found that tenoxicam 20mg injected locally was effective in alleviating pain and in improving shoulder mobility with well-tolerability in patients with a painful shoulder for a 4-week follow-up period in this study. As a matter of fact, this time of the follow-up was short to evaluate efficacy of treatment for soft tissue problems. Therefore, we have selected longer follow-up time because of the need of the longer time for healing process of soft tissues. The reports of tenoxicam about safety in soft tissues were also limited. It was shown in one study that intra-peritoneally administered tenoxicam decreases tissue

prostaglandin E2 levels and intra-abdominal adhesions with no peritoneal reaction in mice (26).

As a conclusion, we decided that periarticular tenoxicam injection is a rapidly-acting, safe, well-tolerated, and cost-effective treatment in shoulder impingement syndrome. The limitation of the present study was the lack of a placebo group and fack that we did not evaluate whether Codman's exercises were performed as effectively. Further placebo controlled studies are necessary to investigate the effectiveness of periarticular tenoxicam injections.

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