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Original Article

The Effects of Conventional Physical Therapy with and Without Dry Needling on Pain, Range of Motions and Functional Disability in Patients with Shoulder Impingement Syndrome

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ABSTRACT

Dry needling is a technique in which thin monofilament-based needles are inserted into soft tissues, especially trigger points in muscles. It is being used in a range of neuromuscular pain syndromes such as shoulder impingement syndrome in current study. In physical therapy, it is narrowly referred to as an intramuscular procedure for the treatment of myofascial trigger points (MTrPs). **Objective:** To compare the conventional physical therapy with and without dry needling on pain, range of motion, and functional disability in patients with shoulder impingement syndrome. **Methods**: It was randomized controlled trial conducted in 66 patients of shoulder impingement syndrome based on inclusion criteria and divided randomly allocated equally in two groups of 33 in each of conventional therapy and dry needling group. The outcome measures used were numeric pain rating scale for pain, DASH for hand arm function and shoulder ranges of motion. The SPSS 25.0 was used to analyse data. The descriptive statistics was applied, and inferential statistics was applied based on findings of tests of normality. **Results**: The results showed that the post interventional pain score was 1.43±1.37, 32.11 for conventional group and for experimental group that of 1.60±1.02, 34.89 with non-significant difference 0.544, while DASH score was 27.02±13.22, 38.85 for conventional group and for experimental group that of 19.92±11.20, 28.15 with significant difference 0.024. The results for flexion, abduction, internal and external rotation were non-significant with p value >0.05. **Conclusion**: It was concluded that although there was significant improvement in pain, range of motion and function in both of dry needling and conventional groups, however, pain and shoulder ranges improved equally in both groups without a statistically significant difference while that of disability improved significantly in dry needling group.

INTRODUCTION

Sub acromial pain syndrome refers to any shoulder problem that is not caused by an injury and causes pain around the acromion [1]. The pain typically intensifies during or after lifting the arm. It includes any kind of discomfort caused by damage to a structure or structures in the sub acromial space. SAPS is the most common shoulder condition [2,3]. SAPS accounts for 44 to 65 percent of all shoulder pain complaints, and its prevalence rises with age. The majority of cases occur within one's sixth decade of life. The majority of individuals affected are beyond the age of 40 and suffer from chronic pain that cannot be ascribed to an injury. Patients complain of pain while elevating the affected arm between 70 and 120 degrees, executing a "Painful Arc" over their heads, or sleeping on the affected side [4]. The symptoms may arise suddenly or gradually. Rather than a forceful outside force, most "impingement" is caused by a slow-growing sickness. Because of this, it may be hard for patients to figure out when their symptoms started. The patient's age, degree of exercise, and general health all influence the therapy. The goal is to relieve pain

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and restore functioning. For up to a year, or until the patient heals and can return to work, conservative therapy should be the preferred choice. If the patient does not respond to non-surgical treatment, surgery may be the next step [5,6]. Conservative treatment includes resting the shoulder as much as possible; limiting activities that aggravate the pain, especially overhead activities, taking non-steroidal anti-inflammatory drugs to improve pain and swelling; managing the shoulder with physical therapy, and receiving a sub acromial injection. Cortisone is often used to reduce inflammation and pain, but it is controversial and should be avoided for tendon pain [7]. There is no conclusive evidence that surgical therapy is preferable to non-surgical treatments. If non-surgical treatment fails to relieve pain or restore function, surgery should be considered [8]. Depending on the kind and severity of the damage, many types of surgery may be done, but there is no clear favourite at this time [9]. Recent systematic reviews on this subject have emphasized the need of additional high-quality research, particularly studies that cover a range of modalities to reflect actual practice [10-12]. In this randomized controlled trial, the effects of standard physical therapy with and without dry needling on pain, range of motion, and functional impairment in people with shoulder impingement syndrome were studied. Parvaneh Jalilipanah et al., conducted to compare the effects of muscle energy and dry needling among shoulder impingement syndrome patients with activated trigger points in infra-spinatus. Both interventions found to be effective in improving range and pain, however, dry needling technique was superior in its success to improve function and ranges [13].

METHODS

It was a randomized clinical trial conducted at Physical Therapy department of University of Lahore Teaching Hospital. Non-probability purposive sampling was used. Patients having unilateral non traumatic shoulder pain for at least 3 months, age ranges from 30 to 65 years and pain intensity of 4 points or more on an 11-point numeric pain rating scale were included while patients with the history of shoulder dislocation or fractures, radiculopathy, fibromyalgia Syndrome, medical history of steroid injections in shoulder region or any past cervical or shoulder surgery were excluded. Patients were screened to meet inclusion criteria. Consent form was taken from patients than 33 Patients were randomly allocated in each group. The study was a single blinded Randomized Controlled Clinical Trial. Pain, function and range of motion were assessed at the baseline, after 1st week and 4th weeks of treatment. Range of motion of the shoulder was assessed using a goniometer. Patients were assigned in two groups, control group was given conventional therapy and Group 2 was given dry needling with conventional treatment. The coin toss method of randomization was used to randomly allocate patients with 'Heads' going to dry needling group and 'Tails' going to control group. Dry needling was given once per week in the four weeks of treatment. NPRS for pain, DASH Scale for function and goniometer for range of motion were used. Data were analysed using SPSS 25.0. The categorical variables of Gender and 'affected side' were analysed as frequency tables. Based on tests of normality which showed it to be normative, independent samples T test was used to compare both groups at pre-interventional, post-interventional 1st and 4th week. p-value ≤ 0.05 was considered as significant.

RESULTS

The results regarding gender of the patients for frequency of the interventional group such as conventional group female 51.5% and male 48.5% and for the experimental group female 33.3% and male 66.7% were found whereas the frequency of the affected side of the limb for the conventional group right side 54.5% and left side 45.5% and for the experimental group right side 30.3% and left side 69.7% were found, Table 1.

	Intervention Group		Frequency	Percentage
Gender	Conventional	Female	17	51.5
		Male	16	48.5
	Experimental	Female	11	33.3
		Male	22	66.7
Affected side	Conventional	Right Side	18	54.5
		Left Side	15	45.5
	Experimental	Right Side	10	30.3
		Left Side	23	69.7

Table 1: Gender and Affected Side of the Patients

The results regarding the summary table of outcome measures such as NRPS at baseline for conventional group mean 6.59±SD 1.5, for the experimental group mean 6.98±SD 1.3with p-value 0.327, at 1st week for conventional group mean 3.95 ±SD 1.3 and experimental group mean 3.85±SD 1.1 with p-value 0.739 and at 4th week for conventional group mean 1.44±SD 1.1 and for experimental group mean 1.61 ±SD 1.1 with p-value 0.544 were found whereas DASH score at baseline showed non-significant p value 0.653 and at 1st and 4th week of intervention it showed significant p values 0.023 and 0.024 respectively. Overall ROM for flexion, internal and external rotation at baseline, 1st and 4th week of intervention showed non-significant p values> 0.05, Table 2.

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	Intervention Group	Mean±SD	P-value
NPRS Baseline	Conventional	6.59+1.5	0.327
	Experimental	6.98+1.3	
NPRS 1st week	Conventional	3.95+1.3	0.739
	Experimental	3.85+1.1	
NPRS 4th week	Conventional	1.44+1.1	0.544
	Experimental	1.61+1.1	
DASH Baseline	Conventional	69.39+14.1	0.653
	Experimental	71.92+12.1	
DASH 1st week	Conventional	57.81+15.8	0.023
	Experimental	48.73+15.8	
DASH 4th week	Conventional	27.02+13.1	0.024
	Experimental	19.93+11.2	
ROM Baseline Flexion	Conventional	119.39+22.9	0.534
	Experimental	113.73+16.9	
ROM 1st week flexion	Conventional	144.24+18.5	0.001
	Experimental	121.54+20.3	
ROM 4th week flexion	Conventional	170.27+8.1	0.548
	Experimental	171.72+5.7	
ROM Baseline Internal Rotation	Conventional	44.64+16.3	0.555
	Experimental	42.76+19.2	
ROM 1st week Internal Rotation	Conventional	59.97+10.9	0.918
	Experimental	59.45+15.3	
ROM 4th week Internal Rotation	Conventional	72.39+8.9	0.585
	Experimental	73.36+10.4	
ROM Baseline External Rotation	Conventional	55.15+24.3	0.555
	Experimental	57.27+16.3	
ROM 1st week External Rotation	Conventional	68.18+11.8	0.123
	Experimental	72.51+12.8	
ROM 4th week External Rotation	Conventional	79.79+9.1	0.283
	Experimental	81.79+8.2	

Table 2 : Summary of the Outcome Measures

DISCUSSION

Conservative treatment is the best option for patients with SIS. However, the most effective treatment method, known as the "Gold standard," hasn't been studied yet. A lot of different things, like injections and medication, as well as physical exercise and even cognitive therapy, are recommended by professionals because they have different levels of evidence. When the Visual Analogical Scale was used to measure pain, seven out of the eight trials showed a significant decrease in pain (VAS). Despite this, the addition of DN did not have any statistically significant effects on the level of pain at any time during the follow-up. It was also used in the study by Imani et al [14]. The numerical Pain Rating Scale (NPRS), which is the same as the VAS, was also used. At the end of the study, Gattie et al [15]. looked at data on night pain, pain at rest, and pain during activity. They found that the EG had unique effects across groups, with a big difference in night pain when compared to the other groups. The results of tests that used range of motion (as measured by goniometry) were very different. Halle et al [16]. found that the conventional group did better at shoulder flexion than the group that did the experiment (conventional physiotherapy). People who had DN as part of their treatment had a lot more shoulder abduction [17]. They looked at how these two movements affected the shoulder joint. In six of the studies, the DASH questionnaire [18]. was used to measure how well people were doing as a result of the treatment they were getting. It was found statistically significant differences between the CG and EG at all the time points (immediately, 3–6 months, and 12 months after the intervention) [19]. To examine the effect of dry needling to the infraspinatus muscle function, pain sensitivity and shoulder range of motion in symptomatic and asymptomatic patients with unilateral sub-acromial shoulder pain and concluded that dry needling showed its beneficial effects on reducing pain and increasing range of motion in shoulder joint after 3-4 days of session in especially symptomatic patients with shoulder pain [20,21].

CONCLUSION

It was concluded that there were inconsistent findings regarding effect of dry needling in addition to conventional physical therapy. There was significant improvement in disability of arm and shoulder, however, there was no significant difference in level of pain and shoulder ranges of motion.

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