

Comparison of Conventional Physical Therapy with and Without Maitland Thoracic Manipulation in Shoulder Impingement Syndrome Patients. A Randomized Controlled Trial (RCT)

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ABSTRACT: *The most typical cause of shoulder or sub acromial pain was impingement syndrome. Between 6.7 and 66.7% of people reported having shoulder pain at some point in their lives, and this frequency increases with age, reaching its peak around 50. The most frequent causes of shoulder pain were rotator cuff disease and adhesive capsulitis, both of which may present with the same signs but differ in the results and consequences of particular therapeutic approaches. Various therapies, such as joint mobilization and therapeutic exercises targeted at particular shoulder tissues, were employed in current practice to treat shoulder pain, but their efficacy was limited. The Mayo hospital in Lahore's OPD physiotherapy department hosted this blinded, controlled trial. In this study, two groups of 40 participants were randomly chosen. Static conservative exercise treatment was used to treat the subjects in Group A. The individuals in Group B received Maitland Thoracic Manipulation as part of a conservative exercise therapy regimen. Each patient signed a Performa, and informed consent was obtained from them all. The Neer Impingement test and a self-made and peer-reviewed questionnaire were both utilized to collect data and determine the prevalence of shoulder impingement syndrome. The findings of this study demonstrated that Maitland manipulation was more successful for treating Shoulder Impingement syndrome than conservative therapy alone. Impingement syndrome was the most common cause of shoulder or sub acromial pain. The incidence of shoulder pain was ranging from 6.7 to 66.7% which increase in frequency as age progresses, peaking at 50 years of age. Rotator cuff pathology and adhesive capsulitis were the most common causes of shoulder pain, may exhibit same findings but with variety of outcomes and effects to specific treatment strategies. In current practice,*

different interventions were used for treating shoulder pain, such as joint mobilization and therapeutic exercises, directed at specific tissues of the shoulder, but the effectiveness of these treatment options were limited. According to the study, conservative physical therapy combined with Maitland Mobilization and Manipulation is more effective at treating shoulder impingement discomfort and produces greater results than conservative physical therapy alone.

KEYWORDS: shoulder impingement syndrome, exercise, manual physical therapy, spinal manipulation therapy.

INTRODUCTION

Only low back pain has a higher prevalence than shoulder pain, which is a frequent and debilitating illness. The most typical shoulder issue is shoulder impingement syndrome (SIS), which causes 44% to 65% of all shoulder pain. (1) Many patients with shoulder pain do not usually recover well. Approximately 40 to 50 percent of all patients who seek primary care for a new episode of shoulder pain report continuing symptoms after six to twelve months. (2) The rotator cuff becomes impinged between the greater humeral tuberosity and the bottom of bony prominence or coraco-acromial arch as soon as the upper arm is elevated above shoulder level. Shoulder impingement problem is more prone to occur in those who use their upper arms often at or above shoulder level. (3)

Neer's research helped us understand that the coracoacromial ligament and the front edge of the acromion serve as the primary sites of impingement, and that the functional arc of elevation of the shoulder is forward rather than lateral. As the coracoacromial ligament inserts into the anteromedial border of the acromion, these modifications may include osteophyte forms along a portion of the ligament, supporting the ligament's involvement. The larger tuberosity tends to go more beneath the coraco-acromial arch when the shoulder is bent forward, causing the impingement area to be immediately under the coraco-acromial ligament. (4) Although widespread in middle-aged individuals, non-traumatic symptomatic shoulder diseases are thought to be relatively uncommon among the elderly, according to hospital-based research. (5) Physical therapists frequently see patients with shoulder pain, which has a wide range of probable causes and suggested therapies. This experimental study's goal is to document the immediate effects of thoracic spine and rib manipulation in patients with shoulder discomfort as their principal complaint. (6) Shoulder impingement is a chronic, excruciating condition that impairs a patient's ability to function and quality of life. (7) Evidence suggests that people with shoulder impingement can benefit from guided shoulder stretching and strengthening activities. (8)

The phrase "Regional Interdependence," is used to characterise the prevalence of subacromial discomfort, illustrates how impairment in a distant anatomic region might link patients' symptoms of shoulder pathology. (9). Because shoulder dysfunction could potentially be linked to the dysfunction of the spine, as well as the cervical spine, thoracic spine, ribs, and shoulder complex, manipulative therapy at the thoracic spine is important clinically for treating patients

with shoulder pain. These are all intrinsically connected. From a biomechanical perspective, it has been demonstrated that unilateral side bending, rotation, and extension of the thoracic spine are associated with normal, non-pathologic overhead shoulder movement. (10, 11). Because many muscles important for shoulder kinematics are associated to the thoracic region, the scapula and the shoulder's normal physiological function with complete anatomical range are connected. (10, 12, 13). Joint manipulation may be more effective than traditional therapy alone in treating individuals with shoulder girdle dysfunction than traditional therapy alone, such as stretching and therapeutic exercise. (14) The primary form of treatment for pain, function, and range of motion should be exercise therapy. The short-term pain-reduction process may be sped up by including mobilizations with exercises(15) In a small clinical research, manual physical therapy administered by skilled physical therapists along with guided exercise was found to be superior to exercise alone for boosting strength, reducing pain, and enhancing function in patients with shoulder impingement syndrome. (16).

A randomized clinical trial study was used for comparative efficacy of spinal manipulation with conservative exercise therapy in subjects with shoulder impingement pain. Subjects with syndrome of impingement fulfilling the predetermined sample selection criteria were divided into two groups by even odd randomization. The results of this study proved that Maitland manipulation was more effective with conservative therapy than conservative therapy alone for Shoulder Impingement syndrome.

METHODOLOGY

This particular participant group underwent a randomized clinical trial as the study design (RCT). The Mayo Hospital Lahore's Outpatient Department served as the study's location. Through random sampling, a group of 40 patients was included in the sample. The patient visited the physical therapist on their own initiative or with a physician's referral. Physical therapy techniques and physical provocative tests were used to evaluate the patient. Hawkins Kennedy Impingement Neer Impingement Test were used for the assessment. (17) After obtaining consent, the physical therapist began the evaluation by using the NPRS for pain, ROM for mobility, Manual Muscle Strength, and SPADI for functional status.

By randomly assigning patients to even and odd numbers on dice, patients were split into two groups. Thoracic manipulative therapy was given to patients in Group 1 (the experimental group), whereas conservative therapy was given to individuals in Group 2. Before the first treatment session, the patient underwent a first assessment. With three sessions per week, patients received treatment for two weeks. Patients were monitored for another week to look for any changes in their symptoms and signs.

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| <p>Group A (the Experimental group)</p> | <p>Patients received : Three separate thrust manipulation techniques specifically targeted at the thoracic spine were used in thoracic manipulative therapy, along with exercise therapy such as hot or cold packs, mobility exercises, and strengthening exercises.</p> <p>POSITIONS FOR MANIPULATIVE TECHNIQUES A: Prone mid and lower thoracic manipulation techniques. i. The therapist instructed the subject to take a deep breath in and let it out completely. The therapist administered posterior to anterior pressure to remove soft tissue slack as the individual exhaled. ii. The therapist delivered a high-velocity, low-amplitude manipulative push after the patient had completely exhaled. B: Seated cervicothoracic manipulation technique. i. The therapist put their hands in a fist-crack position close to the C7eT1 region of the participant and passed their arms through their arms. ii. The participant's upper thoracic region was used as a fulcrum by the therapist, who applied one side of the chest to their chest. iii. A high-velocity, low-amplitude thrust in the cephalad direction was delivered while the participant was in thoracic extension during exhale by the therapist.</p> |
| <p>Group B(the control group)</p> | <p>• While in Group 2(control group), patients received Conseavative Exercise therapy including i. hot or cold pack, ii. mobility exercises iii. shoulder strengthening exercises</p> |

RESULTS

Table 1 depicts the demographics data of the groups. There were 14 males and 6 females in group A wile 2 males and 18 females in group B. Mean value of age in group A was 40.5 ± 14.006 while in group B was 55.70 ± 9.995 . Marital status was 4 single, 16 married in group A and in group B were 1 single, 19 married.

Table 2 shows the pre and post treatment scores of NPRS, SPADI and ROM. Showing that group A improved more in scales, pre and post treatment scores in group A and B show significant difference as value of p is less than 0.05. Table 3 depicts the post treatment scores of NPRS, SPADI and ROM. Showing that group A improved more in scales, show significant difference as value of p is less than 0.0

Table 1: Descriptive statistical analysis (N=40) Intervention group and control group

| Intervention Group Mean (SD) | Control Group Mean (SD) |
|---|--|
|---|--|

| | | |
|----------------|-------------------|------------------|
| Gender | 14(M)/6(F) | 2(M)/18(F) |
| Age | 40.95 ± (14.006) | 55.70 ± (9.995) |
| Marital Status | 4(s)/16(M) | 1(s)/19(M) |
| Side Involved | 11(R)/9(L) | 12(R)/8(L) |

Table 2 : Pre and Post Treatment Mean values of intervention group and the control group

| Scale | Intervention Group | | Control Group | | p-value |
|---------------|--------------------|--------------|---------------|-------------|---------|
| | Pre-value | post-value | Pre-value | Post-value | |
| NPRS | 8.6 ± 0.82 | 3.35±1.182 | 7.8± 1.196 | 4.6 ±1.273 | 0.00 |
| SPADI | 88.55±11.33 | 44.7±10.64 | 81.45 ±13.63 | 53.1±13.31 | 0.00 |
| ROM Flexion | 163±13.21 | 174.75± 7.86 | 156.7±16.48 | 162.5±12.92 | 0.00 |
| ROM Abduction | 127.25± 13.32 | 141.75± 6.74 | 126.2 ±13.06 | 131.7±9.07 | 0.00 |
| ROM ER | 69± 12.93 | 81.2±7.75 | 65.75±8.62 | 71.0± 6.80 | 0.00 |

Table 2: Post Treatment Mean values of intervention group and the control group

| Scale | Intervention Group | Control Group | p-value |
|---------------|--------------------|---------------|---------|
| | Post-value | Post-value | |
| NPRS | 3.35±1.182 | 4.6 ±1.273 | 0.00 |
| SPADI | 44.7±10.64 | 53.1±13.31 | 0.00 |
| ROM Flexion | 174.75± 7.86 | 162.5±12.92 | 0.00 |
| ROM Abduction | 141.75± 6.74 | 131.7±9.07 | 0.00 |
| ROM ER | 81.2±7.75 | 71.0± 6.80 | 0.00 |

DISCUSSION

The two most frequent causes of shoulder discomfort were rotator cuff pathology and adhesive capsulitis, both of which may present with the same symptoms but respond differently to various treatment modalities. Various therapies, such as joint mobilisation and therapeutic exercises targeted at particular shoulder tissues, were employed in current practise to treat shoulder pain, but their efficacy was limited.

Conservative therapy alone has less of an impact than thoracic SMT combined with conservative therapy. Although patient ratings of outcomes had improved in both groups, the SMT group had superior outcomes. (18) Variations in patient-rated results pointed to potentially significant advancements. Comparatively to the control group, the experimental group experienced a greater decline in pain levels from the pre- to post-treatment period. The use of thoracic spinal and rib manual treatment of shoulder was significantly more successful, as evidenced by a trend that the intervention group reported a faster recovery in pain. However, the study's findings might have been more significant had it used a larger sample size. In order to track changes in participants' reported levels of pain, the SPADI and an NRS were also used. Both methods revealed significant changes in the experimental group.(19)

According to one study, the care of patients with stage 2 primary impingement was improved by physical therapist monitoring over a placebo and was just as successful as sub acromial decompression surgery combined with postoperative rehabilitation. Joint mobilisation may be more effective than traditional therapy alone in treating individuals with shoulder girdle

Most shoulder impingement pain sufferers are between the ages of 49 and 59. In this study, the experimental group's SPADI scale score ranged from 53.10 to 28.350, while the control group's range was 88.55 to 44.7. When randomized to receive manipulation (including manipulation of the cervical spine, upper thoracic spine, upper ribs, acromioclavicular joint, and glenohumeral joint) as opposed to traditional physical therapy, it had better outcomes. (21)

It was determined from the explanation above that Maitland Thoracic Manipulation combined with exercise therapy is superior to a conservative treatment approach alone.

The goal of the study was to evaluate the effectiveness of exercise therapy against conservative care for patients with sub acromial discomfort. Both of these interventions have been employed in the current study to treat patients with sub acromial discomfort.

Limitations

Early onset degenerative joint disease may result in osteophyte formation on the inferior surface of the acromion could affect shoulder impingement syndrome. Ultrasound or radiographic examination was not utilized in this study to determine a diagnosis. Results and conclusions have limited applicability since data was collected only from Mayo Hospital Physiotherapy ward, Lahore. Less patients were enrolled into the study due to the shortage of time. There was a huge follow up loss.

6. Consent for publication: The study's goals were explained to the participants, and written informed consent was obtained.

7. Competing interests: There are no competing ideas declared by the authors. The study's findings are given simply and honestly, with no exaggeration, manipulation, or improper deletion of information.

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