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EFFECT OF STANDARDISED MANUAL THERAPY AND HOME EXERCISE PROGRAM FOR CHRONIC ROTATOR CUFF DISEASE: A RANDOMIZED CONTROLLED TRAIL

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ABSTRACT

Shoulder complaints are one of the most common musculoskeletal complaints seen by health professionals with an incidence of 9.5 per 1000 patients presenting to primary care and varying data for point prevalence (6.9%--26%). A combination of modalities of physiotherapy, such as manual therapy and exercise, is often used in the management of Rotator cuff disease. These aim to correct modifiable physical impairments thought to contribute to pain and dysfunction rather than to treat the specific pathology. These impairments include rotator cuff and scapular muscle weakness and dysfunction, tightness of the posterior capsule and other soft tissues, and postural abnormalities. Thirty subjects with chronic Rotator cuff disease were selected based on the selection criteria and randomly divided in to two groups. Group-A subjects received standardised Manual therapy and home exercises. Group-B subjects received Ultrasound therapy and home exercise. Both groups were treated for 4 days a week for 3weeks.All the values were tabulated and statistically analyzed by using paired and unpaired t-test. Data analysis revealed significant difference between the two groups in the parameter functional disability. Manual therapy and home exercise is effective than Ultrasound therapy and home exercise in the management of Subjects with chronic Rotator cuff disease in reducing Pain and Disability, thereby improving the functional activities.

Keywords: Chronic Shoulder Pain, Manual Therapy, Ultrasound Therapy, Home Exercises, Numerical Pain Rating Scale (NPRS), Shoulder Pain and Disability Index (SPADI)

INTRODUCTION

Shoulder disorders are a common cause of persistent musculoskeletal morbidity, **[1, 2]** particularly in the middle to older age groups **[3]**. Pain and compromised shoulder function have a substantial impact on tasks essential to daily living, as well as on sleep **[4]**. Shoulder disorders are a common reason for seeking medical care and may require surgical intervention in up to 28% of cases **[5-7]**. Shoulder disorders can thus lead to considerable disability, reduced health related quality of life, absenteeism from work, and use of healthcare resources **[4, 8, 9]**. Although definitions of different diagnostic categories of shoulder pain are controversial, a large proportion of shoulder problems can be classified as "rotator cuff disease," the most common cause of shoulder pain in primary care **[10]**. The term, or its variants such as impingement syndrome, may include a spectrum of pathologies of rotator cuff disease (such as subacromial bursitis, partial rotator cuff tears, and bicipital tendinosis), but they are characterised clinically by pain with abduction (painful arc) and signs of impingement **[11]**. Although standard criteria have not been established for use in clinical trials, most trials that have assessed interventions for rotator cuff disease have used variations of these features to select their study populations **[12-14]**. Rotator cuff disease differs from other major diagnostic categories of shoulder pain such as adhesive capsulitis, osteoarthritis, and calcific tendinitis, which are known to have different presentations, underlying causes, prognoses, and responses to treatment. A combination of modalities of physiotherapy, such as manual therapy and exercise, is often used in the management of rotator cuff disease **[15]**. These aim to correct modifiable physical impairments thought to contribute to pain and dysfunction rather than to treat the specific pathology. These impairments include rotator cuff and scapular muscle weakness and dysfunction, tightness of the posterior capsule and other soft tissues, and postural abnormalities **[16]**.

MATIERIALS AND METHODS

Participants

We recruited sixty (28-male; 32-female) people with chronic rotator cuff disease through medical practitioners and from the community. Inclusion criteria were age over 18 years, shoulder pain for more than three months, severity of pain on movement rated greater than 3/10 on an 0-10 numerical rating scale, pain on active abduction or external rotation, and a positive quick test for shoulder impingement **[17]**. Exclusion criteria were resting severity of shoulder

pain greater than 7/10; reason to suspect a complete rotator cuff tear (for example, substantial shoulder weakness, a positive drop-arm sign, or a high riding humerus on plain radiograph); previous shoulder surgery; radiological evidence of shoulder osteoarthritis, calcification, or previous fracture; systemic pathology including inflammatory joint disease or neoplastic disorders; more than 50% restriction of passive range of motion in two or more planes; shoulder pain referred from vertebral structures diagnosed by spinal clearing tests **[18]**; symptoms of complex regional pain syndrome; active intervention in the previous three months including corticosteroid injection, arthrographic distension of the glenohumeral joint with corticosteroid and saline (hydrodilatation), or physiotherapy; anti-inflammatory drugs in the previous two weeks.

Procedure

Allocations were sealed in opaque and consecutively numbered envelopes kept in a central locked location. An independent administrator opened the envelopes in sequence and then revealed the group allocation to the relevant physiotherapist by facsimile just before the participant presented for treatment.

Manual Therapy

- Soft tissue massage – Ant. & Post. shoulder tissues - 6min each position
- Gleno humeral joint mobilisation—AP & Inferior glides- 4*30 bounds
- Thoracic spine mobilisation (T1-8)--central PA- Grade IV on each level: 4 min in total
- Cervical spine mobilisation (C5-7)--unilateral PA- Grade IV on each level: 4 min in total
- Scapular retraining-elevation/protraction to retraction/depression-- 15*5 with 10 sec hold.
- Home exercises--twice daily in first two weeks; once a day there after.

Ultrasound Therapy

Ultrasound therapy application of a therapeutic gel to the shoulder region for 10 minutes each session.

Outcome Measures

The primary outcomes were the shoulder pain and disability index (SPADI), average pain on movement assessed by a numerical rating scale, and participants' perceived global rating of change overall. The shoulder pain and disability index is a self administered, shoulder specific index consisting of 13 items divided into two subscales-pain (five items) and function (eight items)-with responses to each item recorded on a 10 point scale **[19-21]**. We measured isometric shoulder strength of the symptomatic limb for shoulder abduction and internal and external rotation with the Nicholas Manual Muscle tester. For

abduction, participants were in supine position with the shoulder in 90° of abduction and the dynamometer positioned on the lateral surface of the distal humerus. Measurements of external and internal rotation were made in sitting position with the arm by the side against a folded towel with the elbow flexed to 90° and the dynamometer positioned on the distal forearm.

RESULTS

The collected data were tabulated **(Table 1; Figure 1, 2)** & analyzed using descriptive & inferential statistics. To all parameters mean & standard deviation (SD) were used. Paired t-test was used to analyze significant changes between pre-test & post-test measurements. Unpaired t-test was used to analyze significant changes between two groups.

The post-test mean value of NPRS in Group-A is 3cms (SD-0.45) and post-test mean value of NPRS in Group-B is 4cms (SD-0.56), this shows that Group-B is greater than Group-A with the P value (0.0001).

The post-test mean value of MODI score in Group-A is 36.79% (SD-14.89) and post-test mean value of MODI score in Group-B is 61.33% (SD-12.46), this shows that Group-B is greater than Group-A with the P value (0.0001)

From the Data Analysis of post test, Numerical Pain Rating Scale (NPRS) and shoulder Pain and Disability Index (SPADI) revealed that there is high statically significant difference seen between group A and group B.

DISCUSSION

In this study manual therapy and home exercise reduces chronic rotator cuff disease, after 3 weeks of exercise. The amount of pain experienced was reduced faster in the experimental group than in the control group, Hence thereby we reject the null hypothesis.

The single assessor blinded, controlled trial evaluated the efficacy of a 3week manual therapy and home exercise programme delivered by physiotherapists for the treatment of chronic rotator cuff disease in middle aged to older adults. However, we found significant differences favouring the active group for objective and subjective measures of muscle strength. At follow-up (8 weeks), we saw greater improvements. Changes in overall pain and function measured by the shoulder pain and disability index favoured the active group, Several secondary outcomes also favoured the active group, including shoulder pain and disability index function score, muscle strength, interference with activity, and quality of life. we included patients only if their pain was worse than a specific

threshold level. The next change in symptoms is thus more likely to be an improvement. However, evidence from the secondary outcome of shoulder pain and disability index function score suggests that shoulder function was improved to a significantly greater extent with active treatment. The indicates that manual therapy and home exercise may be beneficial particularly over time. Secondly, several participants failed to complete more than half of the prescribed home exercises, particularly during the unsupervised follow-up period.

Comparison With Previous Studies

A limited number of randomised controlled trials of physiotherapy modalities for chronic rotator cuff disease have been done, and none has tested a combined intervention of manual therapy and exercise against a Ultrasound therapy and home exercise control to allow a direct comparison with our results.

Other studies have compared exercise with arthroscopic surgery and shown similar beneficial outcomes in patients with rotator cuff disease **[23]**. The limited studies evaluating exercise combined with manual therapy have used an exercise only group as the comparator **[24]**. These have found that the effects of exercise on both pain and function are augmented with manual therapy, providing a rationale for evaluating a combined intervention.

CONCLUSION

Our study showed that the particular Manual therapy and home exercise programme tested in this study demonstrated signifi-cantly greater improvement showed compared to Ultrasound and home exercise program group, the benefits of manual therapy and exercise may accrue over time.

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Table 1: Comparison Between Pre & Post Values of NPRS & SPADI for Group -A & B

		GROUP A			GROUP A		
		MEAN	SD	P VALUE	MEAN	SD	P VALUE
NPRS	PRE TEST	14.03	1.03	0.0001	16.02	1.06	0.0001
	POST TEST	4.2	1.45		8.9	1.56	
SPADI	PRE TEST	226	38.13	0.0001	228	26.20	0.0001
	POST TEST	43.79	24.89		79.33	24.46	

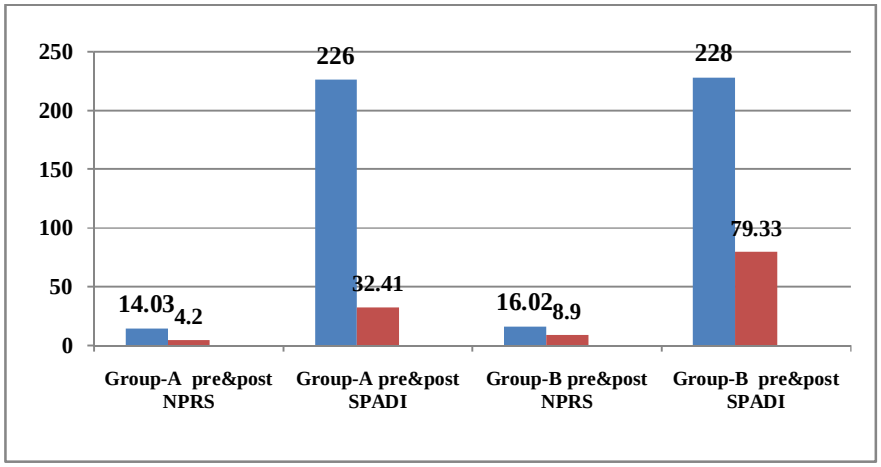

Figure 1: Comparison Between Post Values of NPRS & SPADI for Group -A & B

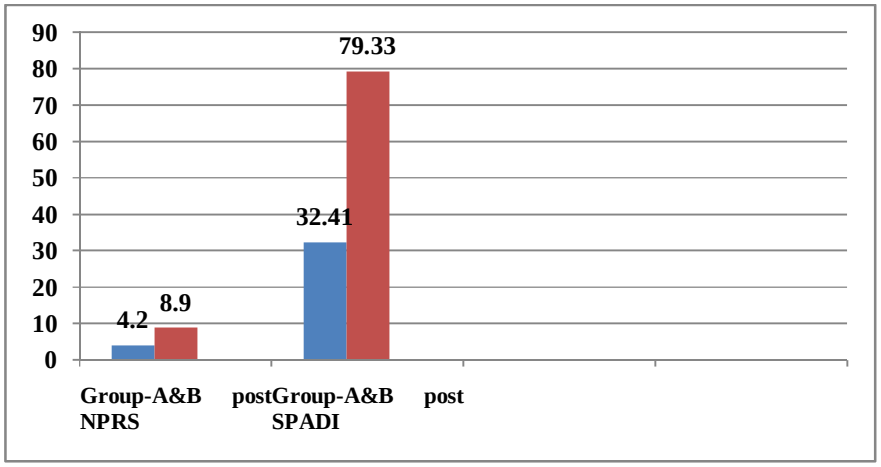

Figure 2: Comparison Between Post Values of NPRS & SPADI for Group -A & B