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RESEARCH ARTICLE

EFFECTIVENESS OF SOFT TISSUE MASSAGE AND EXERCISE FOR THE TREATMENT OF NON-SPECIFIC SHOULDER PAIN.

R. Monisha[1] and Aparna Krishnakumar[2].
1. Assistant Professor, SRM College of physiotherapy, SRM University, Chennai, India.
2. Physiotherapist, Narayana Hrudayalaya, Banglore, India.

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Abstract

Background: Shoulder joint is a highly functional joint in performing normal activities of daily living and other recreational activities. The range of motion of shoulder joint could be limited due to degenerative changes and other non-specific causes.
Objectives: The purpose of the study is to analyze the effectiveness of soft tissue massage and exercise for the treatment of non-specific shoulder pain
Need for the study: The hallmark of the treatment in shoulder pain is a rehabilitation programme aimed at improving the range of motion by reducing the pain by the intervention of exercise and massage. The proposed physiological basis for the effect of soft tissue massage on nonspecific shoulder pain is presently unclear. . This study is therefore conducted to find the effectiveness of soft tissue massage in the management of non-specific shoulder pain.
Methodology: Total number of 20 patients was selected for the study. Out of 20 patients 10 were assigned into two groups, Group A received Soft tissue Massage and Shoulder exercises.Group B received shoulder exercises alone. This study was carried out for a period of 12 weeks. The values of the parameters selected were assessed in pre test and post test study design pattern.
Outcome measures: Visual analogue scale and Range of motion analysis
Conclusion: The outcome of the data collection reveals that the soft tissue mobilization plays a vital role in the reduction of pain in patients with non-specific shoulder pain. The recordable change shows in visual analogue scale and range of motion analysis.

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Introduction:-

Pain motivates the individual to withdraw from damaging situations, to protect a damaged body part while it heals, and to avoid similar experiences in the future[1]. Most pain resolves promptly once the painful stimulus is removed and the body has healed, but sometimes pain persists despite removal of the stimulus and apparent healing of the body; and sometimes pain arises in the absence of any detectable stimulus, damage or disease.

It is a major symptom in many medical conditions, and can significantly interfere with a person's quality of life and

Corresponding Author:- R. Monisha.
Address:- Assistant Professor, SRM College of physiotherapy, SRM University, Chennai, India.

general functioning[2]. Shoulder joint is a highly functional joint in performing normal activities of daily living and other recreational activities[3]. Shoulder pain leads to difficulties in performing activities of daily living and it is an economic burden for both the person and society as a whole. People likely to search health care if they are experiencing severe pain intensity, disability, long duration of the complaint, and chronic pain symptom[4]. Unfortunately, many shoulder problems are non specific in nature.

Methodology:-

Sample design:-

Experimental study design was employed to find out the pre and post intervention measurements

Sample Size:-

In total of 20 patients were included into the study with 10 patients each in the Group A-Experimental group and Group B-Control group.

Selection criteria

Inclusion criteria

a. Pain with restricted ROM of shoulder joint.
b. Impingement syndrome of shoulder.
c. Unilateral involvement
d. Age group between 18 to 50 years.
e. Both sexes were taken for the study.

Exclusion criteria:

a. Subjects with pre existing contractures and deformity
b. Fracture and dislocation in and around shoulder joint
c. Disorders of cervical spine, elbow, wrist and hand.
d. Head injury patient
e. Stroke

Assessment parameters:

- Visual Analogue scale (VAS) is used to measure the severity of pain.
- Goniometer: Used to measure range of motion.

Study protocol:-

Group A: (EXPERIMENTAL GROUP):-

The patients with shoulder pain after evaluation was subjected to massage therapy in the first session and exercise therapy in the second session for the entire treatment session.

Prior to the application of the technique and explanation about the massage and exercise technique is given to every patient. Each patient is given 20 minutes of therapy and ROM is measured after both the session. After the end of the program patient is instructed with exercise program for home.

Intervention:-

Subjects were treated using Soft tissue massage.

Techniques of massage:-
These techniques are applied to upper arm muscles such as deltoid, extensors (triceps and anconeus) and flexors (biceps, brachialis and coracobrachialis).

Superficial stroking
↓
Effleurage (towards the lymph nodes)
↓
Kneading (palmar, whole finger kneading)
↓
Effleurage
↓
Picking up
↓
Effleurage
↓
Wringing
↓
Effleurage
↓
Friction (transverse) (around the shoulder joint)
↓
Effleurage
↓
Hacking
↓
Effleurage

Core Techniques:-
1. Palmar, whole finger kneading
2. Friction (transverse)
3. Effleurage (towards the lymph node)

Group B: (Control Group):-
The following treatment methods were given to the control group patients with non specific shoulder pain. Also patients were given an exercise program which included stretching, range of motion and progressive resistive exercises[5-7]. Each exercise was performed once a day with 10-15 repetitions.

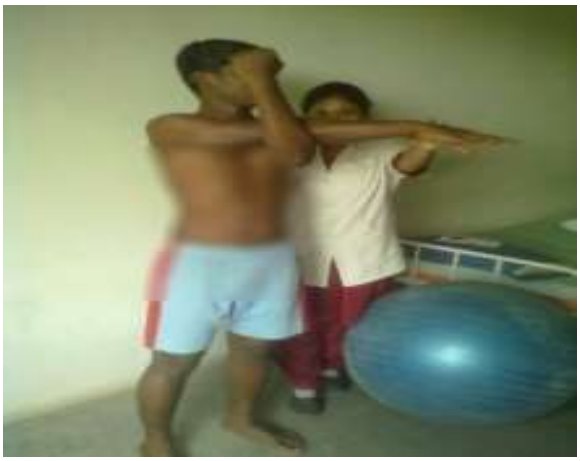
Stretches:-

Wall stretches are exercises that help make injured shoulder joint more flexible.

Wall push-ups are exercises that stretch the muscles and joint capsule of shoulder joint.

Arm across Chest Stretch:-

Begin this exercise standing with back and neck straight. Gently take arm across body using other arm to take it a little further. Hold at a mild to moderate stretch pain free for 15 seconds and repeat 4 times on each arm.



Subscapularis & Pectoral Stretch:-
Begin standing with forearm against a wall and elbow bent to 90 degrees as demonstrated. Gently turn body away from the wall until there is a feel of mild to moderate stretch across chest and front of shoulder without pain. Hold for 15 seconds and repeat 4 times on each arm provided the exercise is pain free.

Basic Rotator Cuff Exercises:-
To begin with, the following basic rotator cuff strengthening exercises should be performed approximately 3 times daily. As strength improves, the exercises can be progressed by gradually increasing the repetitions, frequency or duration of the exercises provided they do not cause or increase pain.

Static Rotator Cuff Push Out:-
Begin this exercise standing with back and neck straight. Keeping elbow at side and bent to 90 degrees, push hand out against the other hands resistance as hard as possible provided it is pain free.
Hold for 5 seconds and repeat 10 times.

Static Rotator Cuff Push In:-

Begin this exercise standing with back and neck straight. Keeping the elbow at side and bent to 90 degrees, push hand in against the other hands resistance as hard as possible provided it is pain free. Hold for 5 seconds and repeat 10 times. Perform on each side.

Shoulder Blade Squeezes:-

Begin this exercise standing or sitting with back straight. Chin should be tucked in slightly and shoulders should be back slightly. Slowly squeeze your shoulder blades together as hard and far as possible provided it does not cause or increase symptoms .Hold for 5 seconds and repeat 10 times.

Pendular Exercises:-
Begin leaning forwards with uninjured forearm supported on a table or bench. Keeping back straight and shoulder relaxed, gently swing injured arm forwards and backwards as far as possible without pain and provided the patients feel either nothing, or, no more than a mild to moderate stretch .Repeat 10 times provided the exercise does not cause or increase symptoms.

Pendular Circles:-
Begin leaning forwards with uninjured forearm supported on a table or bench. Keeping back straight and shoulder relaxed, gently swing arm in circles clockwise as far as can go without pain and provided feel either nothing, or, no more than a mild to moderate stretch.

Repeat the exercise swinging counter clockwise. Repeat 10 times in each direction provided the exercise does not cause or increase symptoms

Shoulder Blade Shrug:-
Begin this exercise standing with back and neck straight. Arm should be at side, slightly away from body with palm facing forwards as demonstrated.

Slowly elevate shoulder blade towards ear as far as possible provided it is pain free. Hold for 5 seconds and repeat 10 times on each side.

Shoulder Blades Forwards against Wall:-
Begin this exercise standing with back and neck straight and hands against the wall as shown. Shoulder blades should be squeezed together fully in this position, elbows straight and should be leaning into the wall slightly.

Keeping back straight, slowly bring shoulder blades forward allowing arms to lengthen. Hold for 5 seconds and then slowly return to the starting position. Repeat 10 times provided the exercise is pain free.

Intermediate Exercises:-
The following intermediate rotator cuff strengthening exercises should generally be performed 1 - 3 times per week provided they do not cause or increase pain. Ideally they should not be performed on consecutive days, to allow muscle recovery. As strength improves, the exercises can be progressed by gradually increasing the repetitions, number of sets or resistance of the exercises provided they do not cause or increase pain.

Resistance Band External Rotation:-
Begin this exercise standing with back straight, shoulder blades back slightly and holding a resistance band as demonstrated. Keeping elbow at side and bent to 90 degrees, slowly move the hand away from body keeping the shoulder blade still. Perform 3 sets of 10 repetitions as far as possible provided the exercise is pain free. Perform on each side.

Resistance Band Internal Rotation:-
Begin this exercise standing with the back straight, shoulder blades back slightly and holding a resistance band as demonstrated .Keeping the elbow at side and bent to 90 degrees, slowly move the hand towards body keeping the shoulder blade still. Perform 3 sets of 10 repetitions as far as possible provided it is pain free on each side.

Resistance Band Pull Backs:-
Begin this exercise in standing or kneeling with back straight and holding a resistance band as demonstrated .Slowly pull the arms backwards, squeezing shoulder blades together as demonstrated. Hold for 2 seconds and return to the starting position. Perform 3 sets of 10 repetitions provided the exercise is pain free.

Side lying External Rotation:-
Lie on side with arm resting on stomach and a small rolled up towel under the arm. Slowly rotate arm upwards and stop when forearm is in a position just above horizontal.

This exercise can be initiated using a 2-3 pound dumbbell

Prone Horizontal Abduction:-
Lie on stomach with arm hanging over side of table and the thumb facing forward.
Slowly raise arm straight out to the side and stop when arm is parallel to the body.

Prone Elevation in the plane of the Scapula:-
Begin in the same position as in the exercise above, except rotate hand so the thumb is rotated 45° out to the side. Slowly raise arm in a plane 45° forward and stop arm just below parallel to the body


Standing Elevation in the plane of the Scapula:-
Stand with dumbbells in your hands, with hands rotated 45° out to the side.
Slowly raise arms at 45° angle approximately ¾ of way above head.

"It must be stressed that all exercises performed with dumbbells must be performed with light weights (2-3 pounds), and later on progress to heavy weight"

Data Analysis:-
Independent't' test
Independent't' test was used to compare the effectiveness of treatment between two groups

$$t = \frac{\overline{x_1} - \overline{x_2}}{S}\sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

$$S = \sqrt{\frac{\sum\left(x_1 - \overline{x_1}\right)^2 + \sum\left(x_2 - \overline{x_2}\right)^2}{n_1 + n_2 - 2}}$$

Table 1:- Visual Analogue Scale

S. No	GROUP A			GROUP B		
	Pre test	**Post test**	**Difference**	**Pre test**	**Post test**	**Difference**
1	9	4	5	8	5	3
2	8	2	6	10	6	4
3	9	5	4	7	6	1
4	7	4	3	6	5	1
5	8	3	5	8	6	2
6	9	5	4	9	4	5
7	6	3	3	10	6	4
8	9	4	5	6	5	1
9	8	3	5	6	4	2
10	7	2	5	8	5	3

MEAN = 4.50 MEAN = 2.60

SD = 1.222
t = 3.475

Table 2:- Range Of Motion: Pre-Test And Post-Test Values Of Shoulder Flexion

S.No	GROUP A			GROUP B		
	Pre test	**Post test**	**Difference**	**Pre test**	**Post test**	**Difference**
1	150	180	30	120	150	30
2	155	175	20	135	160	25
3	150	180	30	145	170	25
4	120	170	50	100	130	30

5	110	160	50	110	145	35
6	150	180	30	100	130	30
7	140	175	35	125	150	25
8	85	160	75	140	170	30
9	90	170	80	150	180	30
10	125	175	50	110	130	30

MEAN = 45 MEAN = 28

SD = 14.453
t = 2.630

Table 3:- Pre Test And Post Test Values Of Shoulder Extension

	GROUP A			GROUP B		
S.No	Pre test	Post test	Difference	Pre test	Post test	Difference
1	50	60	10	40	50	10
2	50	60	10	20	35	15
3	30	50	20	25	35	10
4	35	55	20	30	45	15
5	50	60	10	35	45	10
6	30	50	20	40	50	10
7	40	60	20	45	60	15
8	35	55	20	45	55	10
9	35	60	25	30	45	15
10	40	55	15	25	40	15

MEAN = 17 MEAN = 12.5

SD = 4.233
t = 2.377

Table 4:- Pre Test And Posttest Values Of Shoulder Internal Rotation

	GROUP A			**GROUP B**		
S.No	**Pre test**	**Post test**	**Difference**	**Pre test**	**Post test**	**Difference**
1	25	55	30	45	65	20
2	30	60	30	30	45	15
3	50	65	15	40	60	20
4	50	70	20	25	40	15
5	55	70	15	35	50	15
6	50	65	15	40	60	20
7	45	65	20	30	45	15
8	30	60	30	35	50	15
9	50	70	20	25	45	20
10	35	60	25	20	35	15

MEAN = 22 MEAN = 17

SD = 4.830
t = 2.315

Table 5:- Pre Test And Posttest Values Of Shoulder External Rotation

S.No	**GROUP A**			**GROUP B**		
	Pre test	**Post test**	**Difference**	**Pre test**	**Post test**	**Difference**
1	50	80	30	30	45	15
2	40	70	30	25	45	20
3	55	70	15	40	55	15
4	55	75	20	35	55	20
5	60	75	15	20	35	15
6	70	85	15	25	45	20
7	60	80	20	30	45	15

8	45	65	20	35	55	20
9	40	70	30	40	55	15
10	45	70	25	45	60	15

MEAN = 22 MEAN = 17

SD = 4.830
t = 2.315

Table 6:- Pre Test And Posttest Values Of Shoulder Abduction

S.No	GROUP A			GROUP B		
	Pre test	**Post test**	**Difference**	**Pre test**	**Post test**	**Difference**
1	130	160	30	110	130	20
2	130	150	20	150	180	30
3	135	165	30	140	170	30
4	120	170	50	125	150	25
5	95	140	45	100	130	30
6	120	155	35	110	145	35
7	105	140	35	100	130	30
8	75	150	75	145	170	25
9	100	170	70	135	160	25
10	110	160	50	120	150	30

MEAN = 44 MEAN = 28

SD = 12.910
t = 2.771

Discussion:-

Twenty patients who had non specific pain of shoulder joint participated in this study. They were divided into 2 groups, group A and B each group consisting of 10 patients. They were evaluated before and after treatment. All patients completed the study with the duration of 6 months.The 10 patients in the group A showed maximal pain reduction. The remaining patients in the group B complaint about minimal pain.The range of motion for flexion, extension, abduction, internal rotation and external rotation also showed significant improvement in group A.

Based on the statistical analysis, VAS score showed mean improvement of 4.50 in group A than the mean value obtained in group B is 2.60 with a combined standard deviation of 1.222. The range of motion in group A showed the mean improvement of 45,17,44,22,22 than the mean value of group B 28,12.5,28,17,17 of flexion, extension, abduction, internal rotation, external rotation respectively with a combined standard deviation of 2.630,2.377,2.771,2.315,2.315.The independent t test was used to evaluate whether pain and range of motion was improved with soft tissue massage and exercise significantly before and after treatment. The independent t value for pain is 3.475 which is greater than the table value of 2.262.

The independent t value for shoulder flexion range of motion is 2.630, extension range of motion is 2.377, and abduction range of motion is 2.771.Internal rotation range of motion is 2.315, external rotation Range of motion is 2.315 which are greater than the table value of 2.262.Hence the outcome is considered to be significant favoring the rejection of null hypothesis which could be stated as “there is no effects for soft tissue massage and exercise for the treatment of non specific shoulder pain”

Conclusion:-

The analysis of the data shows that there is significant improvement in two groups. But group A showed more significant improvement than group B.In this study comparing the soft tissue massage and exercise along with home exercise for non specific shoulder pain, it appeared that soft tissue massage and exercise along with home exercise is effective compared to exercise along with home exercise.From this study it is concluded that soft tissue massage along with home exercise is effective in the management of non specific shoulder pain.

Suggestion For Further Study:-

1. This study can be done with larger sample size.
2. Inclusion of patients with shoulder pain with other pathologies.

3. This study can be done in long term duration.
4. This study can be done comparing the effectiveness of ultrasound in the management of non specific shoulder pain.

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