

A comparative study: Effectiveness of exercise program with soft tissue massage and exercise program alone for pain management in adhesive capsulitis of shoulder.

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Abstract

Purpose of the study: The main purpose of the study is to find out the effectiveness of exercise program combined with soft tissue massage as compare to exercise program for pain management following adhesive capsulitis. *Objectives:* To find out the efficacy of exercise program combined with soft tissue massage as compare to exercise program for adhesive capsulitis of shoulder in resting positions and different functional positions. *Methodology:* Quantitative true experimental single blinding study design. 14 patients with adhesive capsulitis were allocated into two groups. 7 patients were in exercise combined with soft tissue massage (experimental) and 7 patients were in the only exercise program (control) group. *Measurement of outcome:* Pain intensity was measured by numerical visual analogue scale. Pain intensity was measured in resting position, forward elevation, sideways elevation, during touching top of the head, during touching opposite shoulder by the affected hand and pain at night. *Result:* Following treatment, the study found that the experimental group showed a high response significant improvement ($P < 0.005$) of pain intensity in resting position, ($P < 0.025$) in forward elevation, ($P < 0.025$) during touching opposite shoulder by the affected hand. A good response in reduction of pain intensity at night was achieved ($P < 0.01$) but in sideways elevation and during touching top of the head, significant pain reduction was not found where ($P < 0.10$). *Discussion and conclusion:* The result of the study showed that exercise program combined with soft tissue massage was better than exercise program alone for pain management in adhesive capsulitis of shoulder. Further well controlled double blinded study with large sample size is recommended.

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Introduction:

The musculoskeletal problems are the center of attention of the health professionals and the pain and disability associated with these problems represent a significant increasing health burden in worldwide (Storheim and Zwart, 2014). Smith (2014) found that who seek medical care following shoulder problems 40% are suffering from adhesive capsulitis. It is the commonest condition referred to physiotherapist for treatment. Physiotherapy is recommended as a first line treatment for the patient with adhesive capsulitis (Ulusoy, et al., 2011). In common physiotherapy intervention exercise program are commonly advised for the patient to prevent the shoulder stiffening up (Robinson et al., 2012). On the other hand, massage is shown to be more effective treatment method for adhesive capsulitis (Camarinos and Marinko, 2010). In Bangladesh there is no real statistics that show how many patients are suffering adhesive capsulitis. There are some non-government organizations that are providing physiotherapy service to the adhesive capsulitis patients. Unfortunately, the researcher did not find out any published statistics from here. On the other hand Centre for the Rehabilitation to the paralysed (CRP) has 100 beds Spinal cord hospital with outdoor services supported physiotherapy department. Many

patients come to the physiotherapy outdoor department with orthopedic and neurological conditions. In the year 2013-2014 (June-July), 12890 patients were treated in the CRP with musculoskeletal problems. Among those patient 1210 had adhesive capsulitis of shoulder joints (Annual Report-CRP, 2014).

Physiotherapy Management: Physiotherapy play an important role in the treatment as well as resolution of adhesive capsulitis (Zuan, et al., 2013), also it is called the first option of conservative management of shoulder adhesive capsulitis. According Page and Labbe (2010) the treatment program primarily consists of pain relief and physical therapy technique which initiated as early as possible to relief pain and restoration of movement

Exercise therapy:

Research show that exercise is one of the best treatments for adhesive capsulitis. According to Australian physiotherapy Association, Exercise is a key component of physiotherapy treatment and symptoms can properly manage by the tailor-made program of exercise (Camarinos and Marinko, 2010; Ulusoy et al., 2011) stated that three types of exercise are commonly used in adhesive capsulitis management these are mobilizing, stretching and strengthening exercise.

Pain relieving modalities: Pain relieving modalities play important roles in management following adhesive capsulitis of the shoulder .Ice, heat ultrasound are commonly used (Kramer et al., 2014). But Dogru (2008) stated that there was no significant advantage was found in application of ultrasound. Also describe that ultrasound application has no beneficial effects and did not demonstrate its effectiveness when compared to placebo.

Methodology

Study design:Quantitative true experimental study design was used for this study. A true experimental design was selected by the researcher because it is perhaps the best known design for beginning researcher (Shahidullah, 2008).
Sampling procedure:14 patients with adhesive capsulitis of shoulder were selected conveniently from outdoor physiotherapy Department of Centre for the Rehabilitation to the Paralyzed (CRP).Typically in health and human health service research, subjects participate in the volunteer basis. That's why group allocation is preferred than random selection. Group allocation was completed by computer generated random number in which 7 participants were recruited in experimental and rest of 7 in the control group.
Material of data collection: The researcher used same materials and the same structured questionnaire in pre-test and post-test condition. The main advantage of structured questionnaire was that it allowed the researcher to collect the data easily and relatively within the short period of time (Shahidullah, 2008). Data collection was completed within 4 weeks from the date of pre-test data collection.

Intervention: In this study, the researcher formulated the exercise program with specific four direction stretching, mobilization and strengthening exercise. At the initial stage of treatment physiotherapist provide same exercise in both control and experimental group. Also in the study the researcher introduced soft tissue massage (Deep transverse friction massage and kneading massage) alone with in the experimental group. The concern physiotherapist applied massage for 10 minutes and also advise patient career to apply massage on shoulder at home. As it was difficult for the patient to apply massage own self, so patient career also involved in this session. At first physiotherapist showed patient career the way of massage application then took a short look at from patient career and ensured that career was understood about the whole process perfectly. Also physiotherapist rechecked the whole process of massage whenever the patients came to take treatment in next session. Each group received 2 sessions of treatment per week for 3 weeks totaling 6 sessions of treatment. In this project study, treatment time was equal in both groups. Both groups received facilities and the duration of treatment session that were same as other outdoor patients in the physiotherapy department. The amount of time spent for both were approximately 30 minutes.

Stretching Exercise	
Exercise	Measures
1. Forward elevation	Five to ten repetitions with 30 sec hold.
2. External rotation	Five to ten repetitions with 30 sec hold.
3. Horizontal adduction	Five to ten repetitions with 30 sec hold.
4. Internal rotation	Five to ten repetitions with 30 sec hold.

Mobilizing Exercise	
Exercise	Measures
1.Joint traction	10 repetitions
2.Caudal glide	10 repetitions
3.Posterior glide	10 repetitions
4.Anterior glide	10 repetitions

Strengthening exercise	
Exercise	Measures
1. Forward elevation in supine.	One set of 10 repetitions with 6 sec hold
2. Forward elevation in sitting	One set of 10 repetitions with 6 sec hold One set of 5 repetitions with 5 sec hold
3. End range Strengthening using theraband	

Massage application:

Deep transverse friction massage:

Firstly physiotherapists observed the shoulder area and identify the location where massage was performed(Manska and Prohaska, 2008). Then place finger across the longitudinal axis of structure and perform the friction by moving the digits, hand, forearm in a line parallel to the movement to be perform. At the time of performing friction massage, finger should move forward and backward across the stretcher with the sufficient sweep or amplitude to the fiber at a depth to engage the affected tissue. Depth of massage is maintained by applying the technique slowly and also to gain some numbing effect.

Kneading massage:

Double handed kneading of the shoulder usually start by reaching hard with shoulder so that hand rest over the shoulder joint with fingertip touching. Thenkneading was given with alternate hand circles. That means the pressure is exerted erom6 o' clock to 9 o' clock with the right hand from 6'o clock to 3 o' clock with left hand give inward pressure, slowly porting on fingertip so that heel of the hand move to rest over mid line of the muscle about six to eight circle with each hand (Harsulkar, et al., 2013).

Process of data collection:

Researcher formulated an assessment form with question about the intensity of pain during resting position, forward elevation, sideway elevation, during touching ton of the

head, and opposite shoulder by affected hand and pain at night. Data collection was completed in two session from subjects one before starting treatment which was pretest test data and another after completing the treatment which was post test data. The researcher had given a responsibility to concern patients physiotherapist to collect the data during the pre-test and post-test both in the experimental and in the control group.

Data analysis:

Data analysis was done using statistical technique. In this Experimental study there were unmatched groups of different subjects, who were conveniently allocated to exercise program combined with soft tissue massage and only exercise program group. Measurement of outcome came from Visual Analogue Scale into ration form. Sharma (2014) stated that the ratio measures represent the highest level of measurement and had an absolute 0 (Zero) point. In view of this, parametric unrelatedt-t-test was used to calculate the significant level in the study.

Significant level:

To find out the significance of the study, the researcher calculated the Pvalue. 'TheP value in an experiment is called the significant level'. The P value refers the probability of the results for this experimental study. A P value of <0.05 was accepted as significant result for health service researcher (Macdonald et al., 2013). According to Skaik (2015), t value to be significant at a particular probability level, it should equal to or larger then critical value associated with the df.

Variables	't' value	P value less than	Significa nt	Not Significa nt
Resting position	3.183	0.005	Significa nt	----- --
Forward elevation	2.580	0.025	Significa nt	----- --
Touching top of the head	0.842	0.10	----- --	Not Significa nt
Sideway elevation	1.189	0.10	----- --	Not Significa nt
Touching opposite shoulder by the affected hand	2.481	0.025	Significa nt	----- --
Pain intensity at night	2.724	0.01	Significa nt	----- --

Discussion and Recommendation:

When massage is applied on adhesive capsulitis shoulder, it showed an effective treatment to reduce pain. The study

revealed that exercise program with soft tissue massage provided significantly greater pain reduction than only exercise program in the management of adhesive capsulitis of shoulder. The results of this study showed and overall improvement in pain rating over the 6 sessions of treatment. Significant pain reduction was found in resting position, forward elevation, during touching the opposite shoulder by the affected hand and night pain. Significant pain reduction was not found in touching top of the head and sideway elevation.

In resting position, significant (P<0.005) pain reduction was observed in exercise program with soft tissue massage than only exercise program group. The result is similar to the study by (Aseer and Subramanian, 2013) thatcompared of exercise versus joint mobilization with soft tissue massage on pain, function and range of motion in patient with adhesive capsulitis of the shoulder. In this study, a significant (P<0.025) pain reduction was found during forward elevation of shoulder in exercise program with soft tissue massage group than only exercise program group. This result is consistent with previous studies where Camarinos and Marinko (2010) found a positive result in favor of massage for patients with adhesive capsulitis of shoulder.

During touching top of the head, significant (P<0.10) pain reduction was not found between the groups. The main reduction of pain intensity in exercise program with soft tissue massage group was 2.7 and in only exercise program group were 2.2 which mean that pain reduction in exercise program with soft tissue massage group was not statistically significant. Joint simultaneously produce two movements and an impingement below the acromion. It may be a cause of pain intensity during touching top of the head.

The event of measurement of pain in side way elevation showed that the pain reduction was not significant (P<0.10) between the two groups. There are six treatment of soft tissue massage around the shoulder brought significant (0.20) pain reduction in side way elevation. Moreover abduction is the close packed position for the shoulder joint and in this position surface of the joints closely contacts and capsule became very taught that may be a cause of pain and could be the reason of the poorest outcome in side way elevation (Hand et al., 2007). So, further study was needed to verify this research outcome.

During touching the opposite shoulder by the affected hand, exercise program with soft tissue massage group showed significant (P<0.025) pain reduction than only exercise program group. One research showed that after receiving 4 weeks treatment (joint mobilization and soft tissue massage) significant reduction of pain was observed during touching the opposite shoulder by the affected hand with a P< 0.001 (Vermeulen et al.,2011).

Reduction of pain intensity at night, there was a significant

($P < 0.10$) improvement found in exercise program with soft tissue massage group than exercise program group. Zerosch and Mansour (2013) did a comparative study on 40 participants which were randomly allocated in to 1 of 2 groups. Both group received 6 sessions treatment (2 weeks) and 95% participants reported significant ($P < 0.05$) pain reduction at night. The researcher only measured pain intensity in this research. But joint range of motion (ROM) is also decrease following adhesive capsulitis shoulder.

Conclusion:

The result of this study identified the effectiveness of exercise program with soft tissue massage was better than the exercise program alone for pain management in adhesive capsulitis of shoulder in different positions. The researcher has found significant pain reduction in 4 variables out of 6. That's why; the researcher could reject the null hypothesis. Ultimately the objectives of this study have been fulfilled and formulated a management guideline for the treatment of pain. Thus, it indicates that the current results can be an effective therapeutic approach for the patient with adhesive capsulitis.

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