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Effect of yogic asana on Adhesive capsulitis (frozen shoulder) to increasing the internal rotation

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Abstract
Frozen shoulder is a condition that causes restriction of motion in the shoulder joint. Frozen shoulder cause the capsulitis surrounding the shoulder joint to contract and from scar tissue. Yogic exercise is vital in maintaining good range of motion (ROM) with joint and the flexibility of muscles. though there are different yogic asana for the treatment of frozen shoulder but the aim of the study was to compare the effect of sleeper stretch and yogic asana intervention for increasing the internal rotation in frozen shoulder and which one is more beneficial for the treatment of frozen shoulder and to increase its internal rotation which can be recommended for the treatment.

Keywords: Frozen shoulder, yogic asana. adhesive capsulitis

1. Introduction
Adhesive capsulitis which means that the capsule is inflamed and scarred. it is also known as "Frozen shoulder" as the name implies movement of the shoulder is severely restricted in people with a. Frozen shoulder this condition is frequently caused by injury that leads to lack of motion due to pain. Frozen shoulder is characterized by pain and loss of motion or stiffness in the shoulder. Frozen shoulder syndrome is a condition in which a soft tissue glenohumeral capsular lesion is accompanied by painful and restricted active and passive shoulder motion [1, 2] It affects about two percent of the general population. Frozen shoulder most commonly affects people the age of 35-65 years and this problem also appears (10-20%) among player who play Lawn tennis, Volley ball, Basketball due to repetitive load due to overhead motions of capsule [3,4]. Rheumatic disease (Gout, Rheumatoid arthritis) progression and recent shoulder surgery can also cause frozen shoulder. Intermitted periods of use may cause inflammation. Adhesions (abnormal band of tissue) grow between the joint surfaces, restricting motion. There is also a lack of synovial fluid, which normally lubricates the gap between the arm bone (humerus) and socket to help the shoulder joint to move. it is the restricted space between the capsule and ball of the humerus that distinguishes adhesive capsulitis from a less complicated painful, stiff shoulder. People with diabetes, lungs disease or who have been accident are at a higher risk for Adhesive Capsulitis. The condition rarely appears in people below thirty years. Yoga therapist cans such type of patients to develop a stretching and Yogic exercise program and also incorporate modalities into rehabilitation for Adhesive Capsulitis (Frozen shoulder)
As stretching involves the fullest elongation of a skeletal muscle in order to improve the muscle's elasticity and reaffirm comfortable tone. The result is a feeling of increased muscle control, flexibility and Range of Motion (ROM).stretching is also used therapeutically to alleviate cramp. In Yoga therapy, different kind of stretching postures (asana) are implemented for the treatment of frozen shoulder. The deceleration phase of the throwing motion creates large distraction force at the shoulder, which may result in posterior shoulder tightness and ensuing alteration in shoulder range of motion (ROM) and may result in an increased risk of shoulder injury. Research have hypothesized that various type of yogic posture increase this motion. Kevin G. *et al* proposed a statistically significantly acute increase in posterior shoulder flexibility. However, his change in motion may not be clinically significant [5].

Idiopathic adhesive capsulitis is a commonly recognized but poorly understood cause of a Painful and stiff shoulder. Although most orthopedic literature supports treatment with physical therapy and stretching exercise, some studies have demonstrated late pain and functional deficits. it was observed that the majority of patients who have phase two idiopathic adhesive capsulitis can be successfully treated with a specific four direction shoulder stretching exercise program. Although measurable limitation and deficiencies were noted at the outcome evaluation, these appeared to be acceptable to most of the patient and did not affect their general health status. Patient with more severe pain and functional limitation before treatment had relatively worse outcomes. more aggressive treatment such as manipulation or capsular release was rarely necessary and the efficacy of early use of these treatments should be further studied [6].it was postulated that the home program for frozen shoulder can lead to improved self-assessed shoulder function [7].

Most asanas are static postures, some of which require muscle contraction which are of Isometric nature. The effects of continued isometric exercise training probably have not been studied well. There is no great increase in the bulk of muscles, but, as can observe in a trained Yogi; capacity to sustained isometric contraction increases.

2. Materials and methods

2.1 Subjects

Forty frozen shoulder patients of both genders at the age group of 35-45 years were randomly involved in the study. They were randomly divided into two groups. Group A consisted of twenty patients and group B twenty patients those who meet the inclusion criteria. Group A had received sleeper stretch and group B Yogic asana introduced. the detail of the examination protocols were explained to each subject and their written consents were taken. pain was measured by VAS(visual analog scale). And affected shoulder Range of Motion (ROM) was measured by goniometer.

2.1.1 Inclusion Criteria

- Forty non-exercise individuals with frozen shoulder.
- Male and female.
- Experience symptoms of pain and limited range of motion for not longer than four months.

2.1.2 Exclusion Criteria

- Progressive muscular weakness
- History of shoulder surgery and other surgery which affects yogic exercise
- Subjects suffering from diabetes, CHD, Ulcer, Hernia, neurological disorder.

2.2 Materials required

- Range of motion measured by using universal goniometer.
- Pain is measured by using visual analog scale (VAS)
- Asana stretching is done manually without any machine/equipment.

2.3 Methods

2.3.1 Scale (VAS) Visual analog

A VAS is designed to measure a characteristic or attitude that is believed to range across a continuum of values and cannot easily be measured directly. Respondents mark the location on the ten centimeter line corresponding to the amount of pain they experienced. This given them the greatest freedom to choose their pain's exact intensity. It also gives the max. Opportunity for each respondent to express a personal response style. There are ten marks (from left to right) over the scale for grading the pain.

2.3.2 Sleeper stretch

- The patient is in side lying on a bed or floor placing his her arm at an angle of 90degree to his/her body.
- Elbow is at 90 degree.
- The patient actively brings the elbow to the maximum height of the shoulder.
- The patient then keeps the opposite hand on the forearm and pushes the forearm down towards the beds.
- Tell the patients to hold this position for thirty seconds.
- Ask to repeat a minimum of 2-5 times per day.

2.3.3 Yogasanas Practices

- Surya namaskara (10 rounds)
- **Sarvangasana:** This performed by elevating the lower four –fifth of the body with the back of the neck and head resting upon the ground. One can stay up to five minutes in this posture or according to capacity.
- **Matsyasana:** Sitting in asana, lie, and supine turning the head backward and resting it in the ground. Lift the buttock up. Attempt to lift the head off the ground putting slight weight on the elbows. Holding the two toes with the two hands and touching the ground
- **Halasana:** In this asana lying supine elevated the lower half of the body putting the weight on the arms and hands just like in sarvangasana. now turn the legs backward and slowly bring them down to touch the ground.
- **Akarna Dhanurasana:** Sitting with legs extended, hold the right great toe with the left hand. now flex the left knee, hold the left foot with the right hand and pull it to touch the right knee. Then repeat it on the other side
- **Matsyendrasana:** Sit with legs extended, flex the right knee, lift it so as to place the right foot in the neighborhood of the left knee. Flex the left knee and insert the left heel under the right hip. Turn rightwards, push the right knee with the left elbow and hold the right foot. Turn backwards look back
- **Bhujangasana:** Lie prone. keep the two hands on the ground on both the sides of the shoulder. Now elevated the head, neck and chest in that order like a serpent. Keep the elbows half flexed. Stay in this position for two minutes then come down.
- **Dhanurasana:** Lying prone, flex the knees, hold near the ankles. Elevate the head and neck. Now elevated the knees off the ground. by contracting the quadriceps muscles, stretch the back, look forwards.
- **Chakrasana:** Lie supine, flex the knee so as to place the feet near the buttocks place the hands on the ground near the shoulders. Now elevate the whole body so as to bear the entire weight the four limbs making the trunk like an arch

Table 1: Effect of Sleeper stretch and Yogic Asana on pain and ROM of Frozen shoulder patients

Sl. No.	Variable	Group a		S.E	t	p	Group B		S.E	t	p
		PRE	Post				Pre	Post			
1.	PAIN	6.0	5.5	0.44	1.11	$p>0.05$ insignificant	7.0	5.7	0.43	3	$p<0.001$ significant
2.	ROM	63.8	64.9	1.28	0.85	$p>0.05$ insignificant	62.1	64.5	1.12	2.13	$P<0.001$ significant

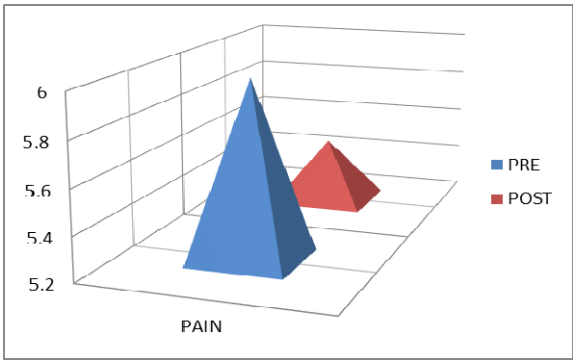

Fig 1: Analysis of Pre Test and Post Test Mean of Pain in Group A

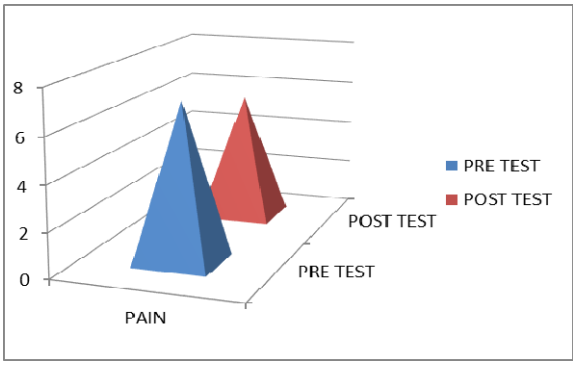

Fig 2: Analysis of Pre Test and Post Test Mean of Pain in Group B

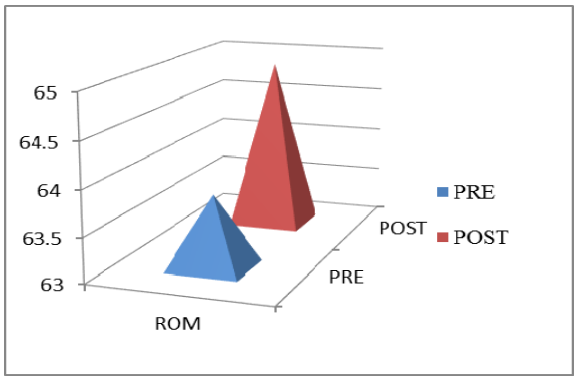

Fig 3: Analysis of Pre Test and Post Test mean of ROM in Group A

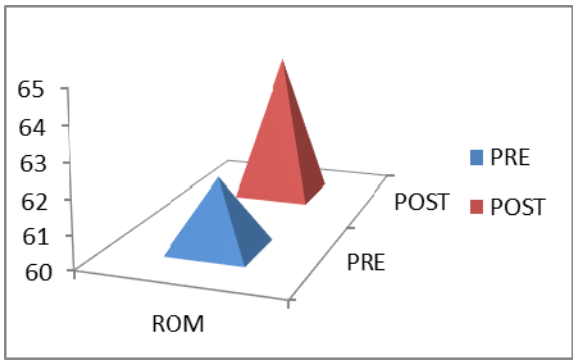

Fig 4: Analysis of Pre Test and Post Test mean of ROM in Group B

3. Statistical Analysis

The data were analyzed using student's t-test. the level of significance was set at $p<0.05$.It is evident from table 1that in group A, sleeper stretch was given for a month on the shoulder joint. The mean difference of pain score for pre test and post test was insignificant ($p>0.05$).hence, pain was not reduced with these intervention given to group A. the mean of ROM for pre test and post test were insignificant ($p>0.05$). Hence, the ROM for internal rotation did not significantly improved with sleeper stretch exercise.

In group B, Yogic asana was given for a month on the shoulder joint(frozen shoulder). the mean of the pain score between pre test and post test was highly significant. Hence, pain was reduced with the intervention made for group B($p<0.001$). The mean of ROM between pre test and post test was highly significant. hence the ROM for internal rotation significantly improved with this intervention made for group B ($p<0.001$)

4. Discussion

Adhesive capsulitis syndrome is a condition in which a soft tissue glenohumeral capsular lesion is accompanied by painful and restricted active and passive shoulder motion. Although several type of pathogenesis have been postulated [8, 9]. But the origin of frozen shoulder syndrome still remains unclear. In many studies the definition is unclear, as are the indication for and timing of interventions. E As a starting point for most published studies, the changes in pain, ROM were noted before and after the treatment in group B. these changes were compared between the group, which showed significant improvement in variables after applying the respective stretches. Pain was found to be reduced and ROM was significantly increased following a month protocol as both muscular and periarticular connective tissue aloe length changes with adequate tensile stress and both are stretched with the asana stretching procedure used in the study. While in group A, no significant improvement in pain and ROM was noted as subjects complained that the stretch itself was painful, whereas no such complaint of pain was made by subject in Yogic Session (group B), Based on itself reported data, Yog asana, will help the patients from frozen shoulder by increasing flexibility and strengthening muscles. Practicing yoga will do more than help shoulder injuries [10] - it will improve all aspects of life. It will help in : - Body and mind coordination, Improve concentration - Control anxiety [11]- Increase flexibility -, strength and breath control, which is part of every Yoga posture, Reduce the risk of injury - Improve patients body work Gain strength and endurance [12-13].

5. Conclusion

We concluded from this study that Yoga posture had more beneficial effect than sleeper stretch exercise in the subjects suffering from frozen shoulder. so, Yoga posture or yogic exercise should be recommended for the treatment of frozen shoulder as per our study but further research is necessary to elucidate a clear and factual basis for therapeutic intervention of frozen shoulder.

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