

A Comparative Study To Find Out The Effectiveness Of Throwers Ten Exercise Vs High Intensity Shoulder Abduction Exercise In Subacromian Pain Syndrome Among Swimmers

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Abstract:

Background: Swimming requires several overhead movement patterns, involving nonstop humeral circumduction in clockwise and untoward clockwise directions. subacromial pain pattern is else known as swoon's pattern. Subacromial smash pattern has been setup to be most common opinion for shoulder joint. NPRS and posterior shoulder abidance test were used as an outgrowth measure. The purpose of the study to compare the effectiveness of throwers ten exercise versus high intensity shoulder abduction exercise of the patients with subacromial impingement syndrome among swimmers.

Methodology: The study was conducted in Pondicherry swimming centre, 30 subjects who have subacromial smash pattern were signed for the study, subjects were named grounded on selection criteria. Group A – throwers ten exercise and Group B – high intensity interval training.

Result: The data were analysed using mated t test to find the significance of intervention used among groups. The logical test showed significance for both groups in throwers ten exercise (group A) and HIIT training (group B) were effective in reducing pain and adding the shoulder abidance among both group $p < 0.001$. According to mean difference group B showed more significant than group A

Conclusion: The comparative study conducted among the swimmers concluded that high intensity interval training shows pronounced enhancement in reducing pain and enhancement of shoulder abidance than the flyers exercise.

Key words: subacromial impingement syndrome, throwers ten exercise, high intensity shoulder abduction exercise, NPRS scale, posterior shoulder abduction exercise.

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I. Introduction

Swimming is an individual or platoon racing sport that requires the use of one's entire body to move through water. Swimming requires several overhead movement patterns, involving nonstop humeral circumduction in clockwise and untoward clockwise directions¹ subacromian pain pattern is otherwise known as swoon's pattern. Shoulder pain is the most common musculoskeletal complaint in swimming with reports of prevalence of disabling shoulder pain in competitive insensibility ranging from 27% to 87%^{2,3}. Shoulder pain is third most common musculoskeletal pain encountered in clinical practise after neck and low reverse pain. Subacromial smash pattern has been setup to be most common opinion for shoulder pain.⁴ Manual labour workers requiring prolonged overhead arm position or reiteration outflow sport similar as swimmers and volley ball. SAPS affect from overuse or injury to rotator cuff tendon's this most generally supraspinatus muscle which helps raise the arm into the air. About 40-91% of insensibility are reported to shoulder visage due to repeated abovehead condition. Flyer ten exercise is designed to exercise major muscle around the shoulder complex⁶. Recent study says that flyer ten exercises has appreciatively affected pain relief and ameliorate ADL. High intensity interval training (HIIT) or explosive anaerobic exercise with brief recovery period until point of exhaustion⁵. HIIT of rotator cuff to usual care was doable in SAPS and ameliorate endurance⁵ The subject were assessed by using outgrowth measure similar as

1) NUMERICAL PAIN RATING SCALE: A pain scale used to measure the case intensity.

- 2) POSTERIOR SHOULDER ENDURANCE TEST: It is used to measure the muscular endurance of the shoulder.

II. Materials And Methodology:

The study design was a Comparative study with randomized sampling technique, 30 swimmers were selected from Pondicherry swimming centre. They were allocated into two group, group A(n=15) throwers ten exercise. Group B(n=15) HIIT exercise, the treatment duration is about 6weeks, the outcome measure NPRS and posterior shoulder endurance test.

Study design : comparative study

Study location : Pondicherry swimming centre.

Study duration : 6 months

Sampling size : 30 participants

Sample size calculation : group A [n = 15] throwers ten exercise

Group B [n = 15] HIIT exercise

Subjects & Selection Method: The study design was a comparative study, 30 swimmers with shoulder impingement syndrome were selected from Pondicherry swimming centre. They were allocated into two group, group A(n=15) throwers ten exercises. Group B(n=15) HIIT exercise, The treatment duration is about 6week, the outcome measure NPRS and posterior shoulder endurance test.

Inclusion Criteria:

1. Age between 13-20years
2. Both male and female
3. Pain > 3month
4. NPRS scale ranges value 2 to 7. (Mild to moderate) Posterior shoulder endurance test (below 30 beats perminute)
5. Swimmers with near normal shoulder passive range of motion.
6. Three positives of four following tests
 - Neer impingement sign
 - Hawkins Kennedy test
 - Jobes supraspinatus test
 - Painful arc between 60-90 degree of abduction

Exclusion Criteria:

1. Subject with history of shoulder surgery
2. Neurological deficit Adhesive capsulitis Osteoarthritis.
3. Full rotator cuff tear
4. Rom was restricted due to burns or postoperative scars
5. Cancer patient
6. Diabetic patients.

Procedure:

The subject who fulfill the inclusion criteria were participated in the study. Such eligible subject was selected in this study after obtaining informed consent. The subject will be assessed before the treatment and at the end of 6-week by using posterior shoulder endurance test and numerical pain rating scale. The tool of 30 subject will be divided equally into 2 group. GROUP A(n=15) and GROUP B(n=15). GROUP A will receive throwers ten exercise and GROUP B will receive high intensity interval training exercise.

GROUP A: throwers ten exercise

Throwers ten exercise

1. diagonal pattern flexion
2. diagonal pattern extension
3. external rotation at waist
4. external rotation at shoulder level

- 5.shoulder abduction to shoulder level
- 6.press up
- 7.push up

FREQUENCY	2-3days/week
REPITATION	2 set of 10 reps
DURATION	30-40 minutes.

Group- B: High intensity interval training

High intensity interval training is a training protocol alternating short period of intense or explosive anaerobic exercise with brief recovery period until the point of exhaustion, which thereby relies on “The anaerobic energy releasing system almost maximally”

- 1) Dumbbell lateral raise
- 2) Bent arm lateral raise
- 3) Push ups
- 4) Dumbbell front raise
- 5) Cable lateral raise

Frequency	4 days per week
Repetition	6 to 8 reps
Duration	rest about 2 mins between eachset

Cryotherapy

Cryotherapy is applied to both the group to reduce the pain. The duration of this method is 10-15 minutes.

Statistical Analysis & results

A study “**To compare the effectiveness of throwers ten exercise vs high intensity shoulder abduction exercise in sub acromial pain syndrome among swimmers**”- the pretest and post interventional differences within the two groups were analysed using paired ‘t’ test and the interventional difference between the two groups were analyzed using unpaired ‘t’ shirt for the outcome measure. statistical analysis was said that $p < 0.001$.

WITHIN THE GROUP ANALYSIS OF POSTERIOR SHOULDER ENDURANCE TEST.

Showing the pre and posttest values of group A(paired t- test values)

GROUP A	MEAN	SD	t- value	p-value
Pre test	24.8	3.32	12.7	<0.001
Post test	35.53	1.72		

The p value of posterior shoulder endurance test in group A is <0.001 considered significant. The t value of posterior shoulder endurance test in group B is 12.7 with 14 degrees of freedom

WITHIN THE GROUP ANALYSIS OF POSTERIOR SHOULDER ENDURANCE TEST

GROUP B	MEAN	SD	t- value	p-value
Pre test	23.6	3.82	26.6	<0.001
Post test	48.6	4.62		

The p value of posterior shoulder endurance test in group B is <0.001 considered significant. The t value of posterior shoulder endurance test in group B is 26.6 with 14 degrees of freedom

WITHIN THE GROUP ANALYSIS OF NUMERICAL PAIN RATING SCALE

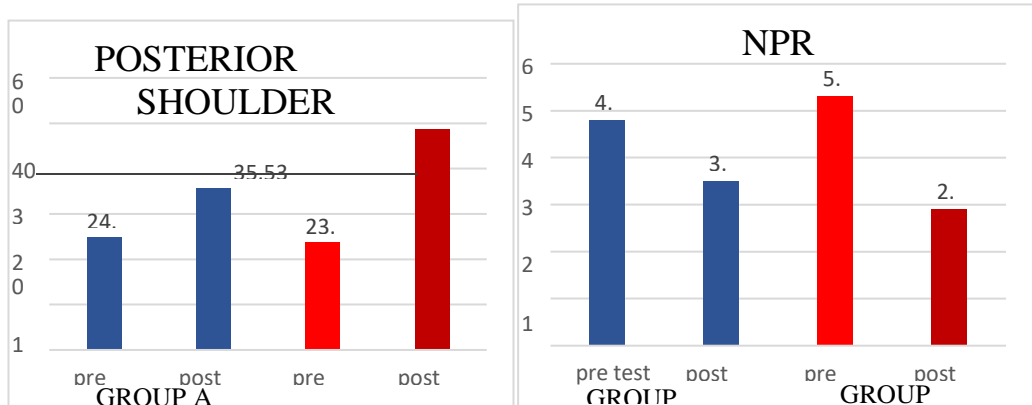
GROUP A	MEAN	SD	t- value	p-value
Pre test	4.8	0.63	6.09	E<0.001
Post test	3.5	1.08		

The ‘t’ value NPRS in Group A is **6.0908** with 14 degrees of freedom and considered statistically significant (‘p’ <0.001)

GROUP B	MEAN	SD	t- value	p-value
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Pre test	5.3	0.82	14.6969	<0.0005
Post test	2.9	0.74		

The 't' value NPRS in Group B is **14.6969** with 14 degrees of freedom and considered statistically significant (**'p' < 0.0005**)



Within the group analysis of pre and posttest of posterior shoulder endurance test in group A and B
Within the group analysis of pre and posttest of NPRS in group A and B

BETWEEN THE GROUP ANALYSIS OF PSET IN GROUP A AND GROUP B

Showing the pre and post-test values of GROUP A & B (unpaired t-values)

	MEAN	SD	t- value	p-value
GROUP A	10.73	3.19	10.93	<0.001
GROUP B	25	3.64		

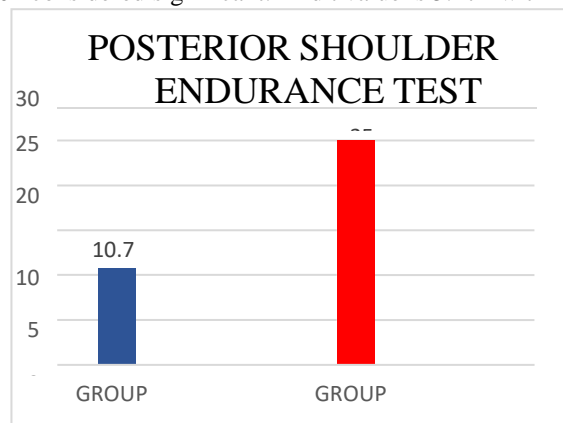
The p value of PSET is <0.001 considered significant. And t value is 10.93 with 28 degree of freedom

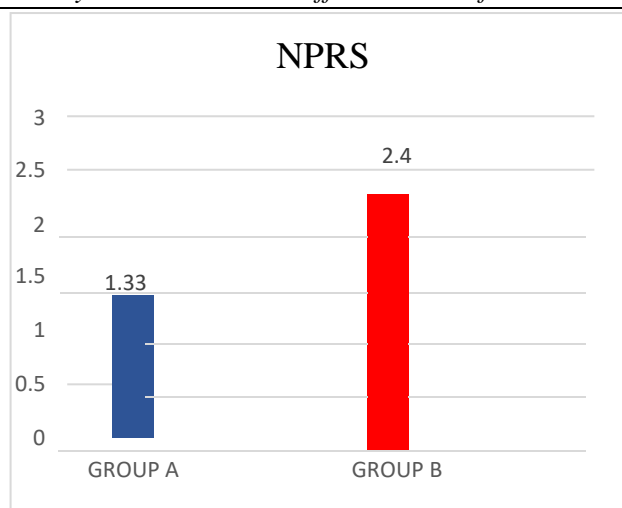
BETWEEN THE GROUP ANALYSIS OF NPRS IN GROUP A AND GROUP B

Showing the pre and post-test values of GROUP A & B (unpaired t-values)

	MEAN	SD	t- value	p-value
GROUP A	1.33	0.61	5.171	<0.001
GROUP B	2.4	0.507		

The p value of NPRS is <0.001 considered significant. And t value is 5.171 with 28 degree of freedom





**Between the group analysis of PSET in group A and B
Between the group analysis of NPRS in group A and B**

III. Discussion

The present study is to compare the effectiveness of throwers ten exercise and high intensity shoulder abduction exercise in subacromian pain syndrome among swimmers

Pre and posttest were assessed before 6 weeks using the outcome measure such as NPRS and posterior shoulder endurance test. The value was statistically analyzed using repeated measure of paired t test

In this study who fulfilled the inclusion and exclusion were taken with age group between 13-20 years. they were randomly allocated to 2 group A and group B each containing 15 subjects. Throwers ten exercise was given to group A and High intensity shoulder abduction exercise was given for group B. The outcome was assessed by using the NPRS and posterior shoulder endurance test. The outcome measure is used to assess the pain and endurance before and after treatment.

Subacromial pain syndrome defined as pain of non-traumatic origin localised around the acromian, is a debilitating, common and often chronic condition. Throwers ten exercise programmed is designed to work out the major muscles of overhead athletes and this exercise programmed strengthen the major muscle around the shoulder joint and thereby increase the endurance of the shoulder. **Zeynep hazar et.al.**, said that throwers ten exercise programmed has a positive effect on reducing pain and functions in shoulder impingement syndrome.

High intensity interval training is a training protocol alternating short periods of intense or explosive anaerobic exercise with brief recovery periods until the point of exhaustion. **Thomas j o' leary et.al.**, conducted a study to examine the effect of high intensity interval training compared to volume matched moderate intensity training on muscle pain tolerance .and this study concludes that HIIT has increase muscle pain tolerance and increased muscle endurance of the shoulder joint.

The result of this study demonstrated that 6 week of high intensity interval training and thrower ten exercises had shown an improvement in reducing pain and improvement in endurance of the shoulder joint. But finally, it concludes that high intensity interval training (group b) is more effective than throwers ten exercise (group a).

Limitation

- ❖ Study duration is less
- ❖ In this study involved only 13-20 years of age groups
- ❖ In this Study only swimmers are involved

IV. Conclusion

This study concludes that high intensity shoulder abduction exercise (group B) shows significant effect on reducing shoulder pain and improving shoulder endurance when compare with throwers ten exercise (group A) for 6weeks on swimmers with shoulder impingement syndrome. Hence null hypothesis is rejected.

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