

Effectiveness of shoulder stabilization exercises and core stabilization exercises on pain and shoulder range of motion among shoulder impingement syndrome patients

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Abstract

Background of the study: Shoulder impingement syndrome is most commonly seen in the individuals participate in sports and repetitive overhead activities. The most common clinical features include pain, limited range of motion, and decreased strength in the arm. Various physiotherapy approaches are available to treat the patients with shoulder impingement syndrome. This study was an attempt to compare the effectiveness of shoulder stabilization exercises and shoulder stabilization along with core stabilization exercises on pain and range of motion among shoulder impingement syndrome patients.

Objective of the study: The objective of the study was to find and compare the effectiveness of shoulder stabilization exercises and shoulder stabilization along with core stabilization exercises on pain and range of motion in the management of shoulder impingement syndrome patients.

Methodology: 20 patients with shoulder impingement syndrome were selected based on the inclusion and exclusion criteria. They were randomly allocated into two groups A and B, consists of 10 subjects each. Group A was treated with shoulder stabilization exercises and group B with shoulder stabilization along with core stabilization exercises. The pain was measured by VAS scale and shoulder abduction and external rotation range of motion was measured by goniometer.

Conclusion: Shoulder stabilization exercises and shoulder stabilization along with core stabilization exercise both shows significant reduction in pain and increased range of motion in both groups but when comparing both shoulder stabilization along with core stabilization exercises is more effective than the shoulder stabilization exercises alone in reducing pain and improving shoulder range of motion.

Keywords: Shoulder impingement syndrome, Stabilization exercise, Core stabilization, Visual analogue scale, Goniometer.

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I. Introduction

Shoulder impingement is a clinical syndrome in which soft tissues become painfully entrapped in the area of the shoulder joint. Patients present with pain on elevating the arm or when lying on the affected side (1). Shoulder pain is the third most common musculoskeletal complaint in orthopedic practice (2) and impingement syndrome is one of the more common underlying diagnoses (3). Shoulder impingement syndrome is commonly diagnosed in athletes with shoulder pain especially those who participate in overhead and/or throwing activities (4). The most common clinical features include pain, limited range of motion, and decreased strength in the arm (5). The purpose of the study is to find and compare the effectiveness of shoulder stabilization exercises and shoulder stabilization along with core stabilization exercises on pain and range of motion among shoulder impingement syndrome patients.

II. Methodology

Review Board of Kanyakumari Medical Mission, C.S.I Hospital has approved this two group pre and post-test experimental study and a written consent was obtained from the participants after giving clear instructions regarding the treatment procedure and its implications. The study was conducted in Physiotherapy

outpatient department, Kanyakumari Medical Mission C.S.I Hospital, Neyyoor, Kanyakumari, Tamil Nadu, India.

Twenty shoulder impingement syndrome patients age between 20 to 30 were selected for the study and randomly assigned into anyone of the two experimental groups. Group A ten subjects received shoulder stabilization exercises, it includes scapular pushups, ITYW's position. Group B ten subjects received shoulder stabilization along with core stabilization exercises, core stabilization exercises include side forearm plank and prone extension exercise. Intervention lasted for one hour per day, three days in a week and the same was continued for 4 weeks. Pain and shoulder range of motions abduction and external rotation were measured before and after 4 weeks of intervention by visual analogue scale and goniometer.



Figure 1: Scapular push-up Exercise



Figure 2: ITYW Exercises



Figure 3: Forearm Plank Exercise



Figure 4: Prone Extension Exercise

III. Data Analysis And Results

The study aims to find and compare the effectiveness of shoulder stabilization exercises and shoulder stabilization along with core stabilization exercises on pain and range of motion in the management of shoulder impingement syndrome patients.

Table 1: Mean value, Mean Difference, Standard deviation and Paired ‘t’ value of Pain, Shoulder abduction and External rotation range of motion among group A subjects

	Group	Pre test Mean	Post test Mean	Mean Difference	Standard deviation	Paired 't' value
Pain	A	6.7	3.1	3.6	1.17	9.70*
Shoulder abduction		42.8	45.4	2.6	0.84	9.74*
Shoulder external rotation		43.9	47.7	3.8	0.92	13.05*

0.005 level of significance

In group A for pain, shoulder abduction and shoulder external rotation range the calculated paired ‘t’ values are 28.44, 9.74 and 13.05 respectively and the ‘t’ table value is 3.250 at 0.005 level. Since all the calculated ‘t’ values are more than the ‘t’ table value, there is significant difference between pre and post test scores of pain, shoulder abduction and external rotation range of motion following shoulder stabilization exercises among shoulder impingement syndrome patients.

Table 2: Mean value, Mean Difference, Standard deviation and Paired ‘t’ value of Pain, Shoulder abduction and External rotation range of motion among group B subjects

	Group	Pre test Mean	Post test Mean	Mean Difference	Standard deviation	Paired 't' value
Pain	B	7	3.8	3.2	0.91	11.01*
Shoulder abduction		48.3	53.3	5	0.93	16.8*
Shoulder external rotation		43.6	49.4	5.8	0.78	23.29*

0.005 level of significance

In group B for pain, shoulder abduction and shoulder external rotation range the calculated paired ‘t’ values are 34.76, 16.8 and 23.29 respectively and the ‘t’ table value is 3.250 at 0.005 level. Since all the calculated ‘t’ values are more than the ‘t’ table value, there is significant difference between pre and post test scores of pain, shoulder abduction and external rotation range of motion following shoulder stabilization along with core stabilization exercises among shoulder impingement syndrome patients.

Table 3: Mean value, Mean Difference, Standard deviation and Unpaired ‘t’ value of Pain, Shoulder abduction and external rotation range of motion among group A and B subjects

	Group A	Group B	Mean Difference	Standard deviation	Unpaired 't' value
Pain	3.6	3.2	0.4	1.05	8.48*
Shoulder abduction	2.6	5	2.4	0.83	6.35*
Shoulder external rotation	3.8	5.8	2.0	0.85	5.23*

0.005 level of significance

In between group analysis the calculated unpaired ‘t’ values for pain, shoulder abduction and external rotation range of motion are 28.3, 6.35, 5.23 respectively and the ‘t’ table value is 2.878 at 0.005 level. Since all the calculated ‘t’ values are more than the ‘t’ table value there is significant difference between shoulder stabilization exercises and shoulder stabilization along with core stabilization exercises in the management of pain, shoulder abduction and external rotation range of motion among shoulder impingement syndrome patients. When comparing the mean values of both the groups, group B subjects treated with shoulder stabilization along with core stabilization exercises showed more difference in pain and shoulder range of motion than group A subjects treated with shoulder stabilization exercises alone.

IV. Discussion

Results of the present study shows that there is a significant difference both shoulder stabilization exercises and shoulder stabilization along with core stabilization exercises in reducing pain and improving shoulder range of motion among shoulder impingement syndrome patients. Shoulder stabilization exercises prevents inappropriate contraction of the muscles, adjusts the movement, and aids proper posture. The use of stabilization exercises to treat shoulder impingement syndrome in patients reduced their pain and had positive effects on their functional recovery (6). The positive changes occur following core stabilization exercises, as it serves as a muscular corset that works as a unit to stabilize the body and spine and perform as the center of the functional kinetic chain. Because it makes optimal energy production and transfer to distal segments, functional stability of the shoulder may be associated with core control. core stabilization exercises should be improved to provide neuromuscular coordination and normal functioning of the muscles in the shoulder, thereby providing protection from coming injurie (7).

V. Conclusion

Shoulder stabilization exercises and shoulder stabilization along with core stabilization exercises both shows significant reduction in pain and increased range of motion in both groups but when comparing both shoulder stabilization along with core stabilization exercises is more effective than the shoulder stabilization exercises alone in reducing pain and improving shoulder range of motion among shoulder impingement syndrome patients.

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