

Original article:

Short term effectiveness of Kalternborn mobilization in adhesive capsulitis : A randomized control trial

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Abstract:

Introduction: Currently no any standard medical, surgical, or therapy regimen is universally accepted as the most efficacious treatment for restoring motion in patients with shoulder adhesive capsulitis. Present study was planned to check the short term effectiveness of anterior and posterior Kaltenborne joint mobilization techniques for improving shoulder external rotation range of motion in patients with shoulder adhesive capsulitis.

Methodology: Total of 40 patients diagnosed with shoulder adhesive capsulitis were recruited and randomly allocated into two groups. In Group A ($n= 20$) subjects were treated with Therapeutic ultrasound (8mins,2w/cm²,3Mhz),Kalterborn anterior mobilization techniques ,Stretching exercises and strengthening exercises for roatator cuff using theratubes, whereas subjects in Group B ($n= 20$) received Therapeutic ultrasound (8mins,2w/cm²,3Mhz),Kalterborn posterior mobilization techniques ,Stretching exercises and strengthening exercises for roatator cuff using theratubes. These were recorded before and after the session of the training. Total duration of the study was 2weeks.

Results : Statistical analysis of the data revealed that Group A and Group B, there was a highly significant difference between VAS1 and VAS6 ($P<0.01$), highly significant difference in ROM1 and ROM6($P<0.01$) , highly significant difference in Functional Assessment Questionnaire Score FAS1 and FAS6($P<0.01$).

Conclusion: The study confirmed that Posterior Kaltenborne joint mobilization is effective as compared to anterior Kaltenborne joint mobilization and to bring about overall improvement in the condition.

Key Words: Adhesive Capsulitis, Kalternborn Anterior mobilisation, Kalternborn Posterior Mobilisation

Introduction:

The incidence of shoulder pain in general medical practice is estimated to be 11.2/1000 patients ⁽¹⁾.The annual incidence of shoulder symptoms is estimated to be 10 to 25/1000 enrolled patients. ⁽²⁾ Adhesive capsulitis was seen in 17.9% Diabetics compared to 7% in non-diabetics in Indian population.⁽³⁾ The incidence of frozen shoulder in the general population has been reported to be 2-5%, while among individuals with Diabetes it is 10-20% ^(4,5,6) Most authorities agree that adhesive capsulitis is caused by inflammation of the joint capsule and

synovium that eventually results in the formation of capsular contractures⁽⁷⁻⁹⁾ The capsule does not become adhered to the humerus, as the term adhesive implies, but the contracted capsule holds the humeral head tightly against the glenoid fossa⁽¹⁰⁾ Clinically, there is global loss of both passive and active ROM of the glenohumeral joint ⁽¹¹⁻¹³⁾ with external rotation usually being the most restricted physiologic movement⁽¹¹⁾

Currently, no standard medical, surgical, or therapy regimen is universally accepted as the most efficacious treatment for restoring motion in patients

with shoulder adhesive capsulitis⁽¹⁴⁾ While physical therapy is commonly prescribed for this condition⁽¹⁵⁻¹⁶⁾ some studies have found little treatment benefit⁽¹⁾The aim of our present study was to find out the effectiveness of anterior and posterior Kaltenborne joint mobilization techniques for improving shoulder external rotation range of motion in patients with shoulder adhesive capsulitis.

Methodology:

40 subjects (both male and female) between age group of 40 to 70 were selected from outpatient department of Physiotherapy, PIMS,Loni . They were diagnosed of shoulder adhesive capsulitis. After the initial assessment, written informed consent forms were obtained from the participants who met the inclusion criteria. The inclusion criteria of the study were age between 40 to 70 years; shoulder ROM restriction in specific pattern, patients with both primary and secondary Adhesive Capsulitis, normal radiographs of previous two months. Subjects were excluded if they had history of Previous shoulder surgeries to affected shoulder, Previous manipulation under anesthesia of affected shoulder,Patients with shoulder girdle motor control deficits associated with

neurological disorders (e.g. stroke , Parkinson's disease).

The selected subjects were randomly allocated to two different groups: experimental (Group A) and control (Group B) each having 20 participants. The randomization was done using a computerized randomization method. Variables of this study included VAS (Visual analogue scale) for pain, functional assessment questionnaire and Range of Motion(ROM). Abduction range and external rotation range were measured by goniometer. Each subject was asked to mark on the 10 cm long visual analogue scale (VAS) for pain intensity and is also requested to complete functional assessment questionnaire . After the assessment and the data collection, participants were given the therapeutic intervention according to their groups. The whole procedure was approved from the Institutional Ethical Committee (IEC) of Pravara Institute of Medical Sciences,Loni.

Two groups pre-treatment-post treatment test design was done, and study period of this study was 2 weeks.

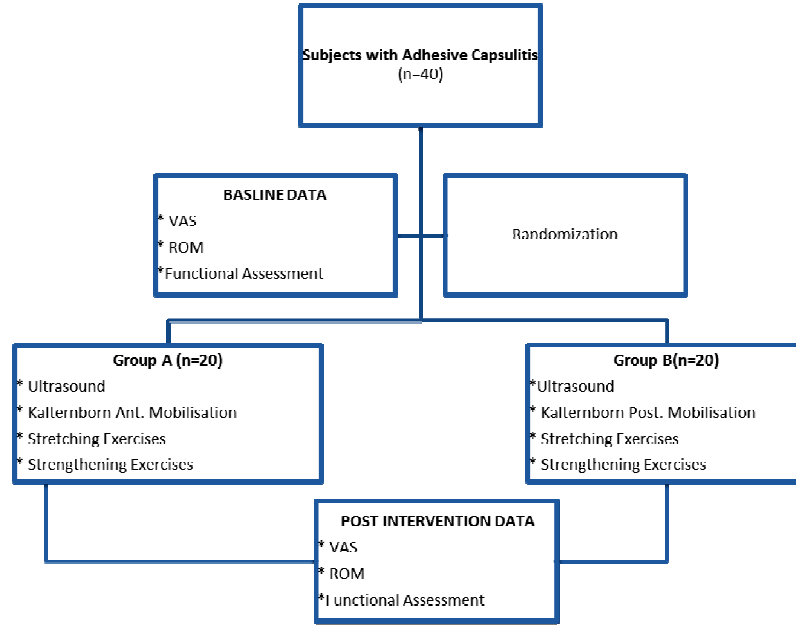
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1. Methodology Flow Chart

Intervention:

Experimental Group A (n=20) was treated with Therapeutic ultrasound (8mins,2w/cm²,3Mhz), Kallernborn anterior mobilization techniques , Stretching exercises and strengthening exercises for roatator cuff using theratubes. This was applied for 3 times a week for 2 weeks (6 sessions).

Control Group B (n=20) was treated with Therapeutic ultrasound (8mins,2w/cm²,3Mhz), Kallernborn posterior mobilization techniques ,Stretching exercises and strengthening exercises for roatator cuff using theratubes. This was applied for 3 times a week for 2 weeks (6 sessions).

Results:

Table 1: Comparison of VAS between two groups

Visits	Group –A Mean+_SD	Group – B Mean +_SD	‘t’ value	‘P’ value	Result
1 st (VAS1)	6.6+_1.18	6.7+_1.17	0.245	P>0.05	Not Significant
6 th (VAS6)	5.3+_1.12	4.3+_1.04	2.85	P<0.01	Highly Significant

Table 2: Comparison of Pain Free External Rotation ROM between two groups

Visits	Group –A Mean+_SD	Group – B Mean +_SD	‘t’ value	‘P’ value	Result
1 st (ROM1)	36.45+_4.50	38.6+_5.31	0.358	P>0.05	Not Significant
6 th (ROM2s)	48.8+_5.66	52.6+_4.70	2.30	P<0.01	Highly Significant

Table3: Comparison of Functional Assessment Questionnaire Score between two groups

Visits	Group –A Mean+_SD	Group – B Mean +_SD	‘t’ value	‘P’ value	Result
1 st (FAS1)	17.19+_2.83	19.84+_2.67	0.268	P>0.05	Not Significant
6 th (FAS6)	25.2+_3.42	29.05+_3.42	11.38	P<0.01	Highly Significant

In both groups, that is, Group A and Group B, there was a highly significant difference between VAS1 and VAS6 ($P<0.01$), highly significant difference in ROM1 and ROM6 ($P<0.01$), highly significant difference in Functional Assessment Questionnaire Score FAS1 and FAS6 ($P<0.01$).

Discussion:

This result is consistent with the findings of Roubal et al ⁽¹⁸⁾ and Placzek et al ⁽¹⁷⁾ who with a posterior gliding manipulation found marked increases in external rotation as well as internal rotation ROM. In contrast, anterior glide mobilization techniques applied in combination with the same program of therapeutic ultrasound and upper extremity exercises

were not effective in improving shoulder external rotation ROM.

Our findings agreed with those of Shaffer et al ⁽¹⁹⁾ in that as subjects experienced less pain their function improved. There was significant reduction in pain in both the groups. (t-value 12.36 p-value <0.01 in anterior mobilization group and t-value - 21.47 & p-value < 0.01 in posterior mobilization group.) A study by Paungmali et al confirmed that manual therapy treatment technique for the shoulder joint is capable of producing hypoalgesic effect during and after its application, this is demonstrated by improvement in PFER during treatment and immediately after treatment.

Harryman et al ⁽²⁰⁾ found in their cadaver studies that altering the capsule (tightening or cutting) affects the translation of the humeral head on the glenoid during physiologic movement of the humerus. They suggest that a tight rotator cuff interval “may not only limit the ROM, but it may also produce unwanted obligate anterosuperior translation,” thus limiting the posterior translation associated with external rotation ⁽²¹⁾ Roubal et al ⁽¹⁸⁾ suggest that by manipulating the humeral head posteriorly, they might have increased the total allowable excursion of the capsule, thus improving external rotation

In this study, the stretch mobilization procedures were performed for a total of 15 minutes of low-load stretch at end range external rotation and/or abduction during each treatment session, with the intention to elongate the glenohumeral capsular

contracture. Substantial improvements were made in the PM group in just 6 treatment sessions. If a component of the improvement in external rotation ROM is associated with normalizing the humeral head position in the glenoid fossa, then it may be that stretch mobilizations of shorter duration are adequate to produce similar results.

Conclusion:

Posterior Kaltenborne joint mobilization is effective as compared to anterior Kaltenborne joint mobilization and to bring about overall improvement in the condition. Additionally there were no adverse effects reported in the short term implying that the technique is both safe and effective in producing pain relief.

Conflict of Interest: The author’s report no conflict of interest



1. Subject receiving posterior kaltenborne joint mobilization for shoulder adhesive capsulitis.



2. Subject receiving anterior kaltenborne joint mobilization for shoulder adhesive capsulitis.

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