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ROLE OF KALTENBORN MOBILIZATION IN IMPROVING SHOULDER FLEXION ROM IN ADHESIVE CAPSULITIS

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ABSTRACT

Introduction: Shoulder joint is one of the most mobile joint of human body. Being very mobile joint its stability is compromised. Because of these factors along with some others, it is prone to different disorders such as adhesive capsulitis. An individual suffering from frozen shoulder finds him into a difficult situation in performing activities of daily living. Decrease blood supply, inflammation and injury to joint capsule may lead to restricted range of motion (ROM). Frozen shoulder can be primary or secondary. Primary being without any cause while secondary frozen shoulder is due to any other co-morbidity such as cervical spondylosis or diabetes mellitus. Females are more prone to develop frozen shoulder than males. This condition is also seen more in the non-dominant side. **Setting:** Fatima memorial hospital (FMH) Lahore. **Material and Methods:** In this study, effects of Kaltenborn mobilization in improving shoulder flexion ROM due to frozen shoulder were observed. Two groups having 30 patients each were formed in this research. A combination of Kaltenborn along with ROM exercises was administered to one of the groups while the other group was given Kaltenborn mobilization alone. During the study it was observed that combination therapy showed better results in improving shoulder flexion ROM. **Results:** Mean change in flexion was 43 ± 6.48^0 in combination of kaltenborn + ROM while for kaltenborn alone the mean change in flexion was 15.60 ± 5.04^0. **Conclusion:** The combination of Kaltenborn mobilization with ROM exercises was cost effective, non-invasive and safe without any danger to the patient with frozen shoulder.

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INTRODUCTION

There is shoulder pain and loss of active and passiverange of motion (ROM) due to debilitating frozen shoulder. All ranges are restricted in such individuals but external ROM in particular.[1] In frozen shoulder fibrosis leads to formation of capsular adhesions.[2] Although this condition is difficult to treat yet it is self-limiting.[3,4]

Different ailments such as acromioclavi cularar thropathy, neoplasm, osteoarthritis, rotator cuff tendinopath, asystemic lupus erythematorsus, subacromial or subdeltoid bursitis can mimic frozen shoulder. There are multiple treatment options under the headings of conservative and non-conservative treatments. Analgesics e.g. NSAIDs, acetaminophen; oral prednisone and intra-articular injections of corticosteroid are included in conservative treatment. Manipulation under anesthesia and capsular release are some of the other options which are under cover of non-conservative treatment.[5]

Multiple options are available for treating frozen shoulder. Pulley therapy and passive articular stretching are among them. Apart from above mentioned strategies there are some other methods such as thermoanalgesics and electroanalgesic which are being used as treatment options.[6,7,9] Mobilization is another choice for some researcher. Such mobilizations include Kaltenborm, Mulligan, and Maitland etc. Main target of these mobilization techniques is to

gain near to normal ROM. Yang*et al.*, conducted a research in which end range mobilization (ERM), mid-range mobilization (MRM) and mobilization with movements (MWM) were compared for their effectiveness. All of these were equally beneficial. Kaltenborn and Mulligan mobilization techniques were compared for improving shoulder abduction ROM by Tharanath and Mulligan mobilization was found more effective than Kaltenborn in that study.[9] Shorter lever manipulation was quite useful in reducing compressive forces on the joint and this technique is frequently used by different physiotherapists. Compression forces are reduced by the concept of Kaltenborn which uses the transitory traction forces produces the gliding in treatment plane.[10,11]

ROM exercises and Kaltenborn mobilization technique were proved to be more effective in improving shoulder flexion ROM in adhesive capsulitis. This was compared with application of Kaltenborn mobilization alone. Both the groups of participants were given 20 minutes of treatment for three days a week.

OBJECTIVE

The effectiveness of Kaltenborn mobilization technique was compared in improving shoulder flexion within and without ROM exercises which was the main objective of the current study.

MATERIAL AND METHODS

Study Design: randomized clinical trial.

Setting: Fatima Memorial Hospital (FMH) Shadman Lahore.

Study Group

Group I (Experimental group): in this group 30 participants were treated with kaltenborn mobilization technique with ROM exercises.

Group II (Control group):this group comprised of 30 participants which were treated with kaltenborn mobilization technique alone

Sample Size

60 patients were distributed into two groups.

Sampling Technique

Systematic sampling was used in which all the odd ordered patients (1st, 3rd, 5thetc.) were included in group I while all the even ordered patients (2nd, 4th, 6thetc.) in group II.

SAMPLING SELECTION CRITERIA

Inclusion Criteria

Patients suffering from idiopathic frozen shoulder with age 40 to 60 years were included in the current study.

Exclusion Criteria

- Arm fracture
- Diabetes
- Cardiovascular disease
- Cerebrovascular disease
- Post-surgical stiffness of involved side
- Shoulder dislocation
- Malignancy

METHODOLOGY

20 minutes of mobilization treatment for three days a week was given to both the groups. To make the patients suitable for mobilization the subjects were given analgesics so that mobilization can be tolerated in order to gain the ROM. Except analgesics no other treatment options such as shortwave, infrared, etc. were given to the subjects as these could affect the outcomes of the study. Shoulder flexion ROM was measured with the help of goniometer.[12]

Treatment table, towel rolls and mobilization belts were used during the current study.

RESULTS

The following table shows the changes in ROM before and after the application of techniques. Mean change in flexion was 43 ± 6.48^0 in combination of kaltenborn + ROM while for kaltenborn alone the mean change in flexion was 15.60 ± 5.04^0. All were significantly higher in ***Kaltenborn + ROM group, p-value < 0.05.***

Table1. Flexion range of motion

	Study groups	Mean	S.D	p-value
Flexion change	***Kaltenborn + ROM***	43.00	6.48	<0.001
	Kaltenborn	15.60	5.04	

DISCUSSION

Frozen shoulder is such a painful condition that it affects almost every movement of the shoulder. Not only the active range of motion is affected but passive ranges are also disturbed. Among all the ranges, the most effected ROM is external rotation.[1]

In this condition fibrosis can produce joint inflammation and contracture formation.[2] Movement restriction can result from adhesion formation due to shoulder injury.[3] Physical therapy, acupuncture, medication and surgery can cure this condition. In the absence of any treatment frozen shoulder can be cured naturally. [14] Although there is natural recovery of frozen shoulder but it may take up to fifteen.[15] Flexion ROM which is one of the main features of FS showed a better improvement as far as time is concerned with a combination of Kaltenborn mobilization technique along with ROM exercises.

Frozen shoulder can also be treated with steroid intra-articular injection, nerve block and some distension techniques.[16] The current study utilized cost effective and safe treatment option that is mobilization along with ROM exercises.

In comparison with arthroscopic arthrolysis conducted by De Carlei*et al*., current study utilized non-invasive treatment to increase shoulder range of motion.[17]

Though steroid injection can reduce the pain but this pain reduction is more pronounced in early period of injection. This was established by Roh*et al.,* but contrary to this concept grade 1 and grade 2 mobilization techniques also reduced pain without injecting the steroid.[18]

Another study which was conducted by Park *et al*., suggested that ultrasound guided distention of capsule and fluoroscopic distension were found effective in improving shoulder range of motion. But these treatment options were disadvantageous because they are time taking and expensive. But the current study was free from radiation hazards and was cheaper and hence cost effective.[19]

The combination of Kaltenborn mobilization technique showed better improvement along with ROM exercises when patients with frozen shoulder were treated.

CONCLUSION

The combination of Kaltenborn mobilization with range of motion exercises was cost effective, non-invasive and safe without any dangerto the patient with frozen shoulder improving shoulder flexion range of motion.

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