

Comparing The Effect Of Kaltonborn And Maitland Mobilization On Pain And Disability In Adhesive Capsulitis

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ABSTRACT: Background of Study: Adhesive capsulitis is a condition in which inflammation occur in shoulder joint which lead to pain in shoulder and leading to limitation in activity of daily living and mobilization techniques are effective in dealing with this condition. **Objective:** The objective of this study was to compare the effect of Kaltonborn and Maitland Mobilization in adhesive capsulitis for decreasing pain and disability which occur due to limitation in activity of daily living. **Material and method:** This randomized control trail study was conducted in physiotherapy department Mayo Hospital, Lahore. Simple random sampling technique was castoff and overall of 40 subjects were contributed in this research. From the subjects after taking Informed consent data was collected. Self-made questionnaire was used. Numeric pain rating scale and SPADI index was used as an assessing tool for pain and disability, for data assortment afterward inclusion criteria was contented. patient identified with adhesive capsulitis with limited range of motion, having pain and limitation of activity of daily living, age group 35-70 year, both genders were included, subject who willing to participate and History of shoulder arthritis, rotator cuff and ligament injuries, Malignancy, Peri arthritis shoulder are considered in exclusion criteria. Data was evaluated via using SPSS 23.0 version and Microsoft excel 2010. Mean and standard deviation of age, pain, SPADI for disability pre and post treatment was calculated. The Frequency and percentage of gender, occupation was analyzed, and bar charts were used to present it. Wilcoxon sign test was used to assess the intensity of pain and Spadi disability pre and post treatment with in a group and Man Whitney u test were used to analyze pain and Spadi index between two groups. **Results:** There was significant difference in pain and disability (Spadi index) pre and post treatment in both groups and between the groups, $p=0.000$ ($p<0.05$) but Maitland seems to be more effective as compared to Kaltonborn. Mean value and standard deviation of kaltonborn post treatment for NPRS and SPADI index was 3.4000 ± 1.60263 and 21.4500 ± 12.06768 while in Maitland its was 1.5500 ± 0.75915 and 3.9500 ± 2.39462 . **Conclusion:** Majority frequency shows that of ration of diabetic and female gender were more in adhesive capsulitis. Both techniques were effective for managing patient of frozen shoulder, but Maitland technique was more effective as compared to Kaltonborn for reducing pain, increasing ranges and decreasing disability which would improve activity of daily livings (ADL's).

Keywords: Adhesive Capsulitis, kaltonborn mobilization, Maitland mobilization, activity of daily livings (ADL's), numeric pain rating scale, SPADI index.

1. Introduction

Adhesive capsulitis is also distinguishing as Frozen shoulder (FS) in which inflammation occur in shoulder joint. It's a common pathology or condition which presented in physiotherapy clinical setting, in which shoulder joint having pain with limited range of movements (ROM) which lead to limitation in activity of daily living's (ADLs). It's categorized into three stages based on its pain severity and curb in ROM which lead to ADL's. They represent a restriction in capsular pattern especially external rotation followed by abduction.^[1] The etiology of adhesive capsulitis is still unknown, whereas frozen shoulder is classified into primary (unknown cause) and secondary (known cause includes diabetes, depression, thyroid problem, Parkinson's disease, Polymyalgia rheumatic, lung disease, open heart surgery, breast cancer and Cardiovascular disease) adhesive capsulitis.^{[2], [3]} Majors symptoms include shoulder pain with

restriction in movement ranges and with the passage of time complication moves towards limitation in activity of daily livings like moving hand above of backward or combing hair. Passive and active movement are restricted.^[4] Adhesive capsulitis mostly occurs in the age between 40-70 year.^[5] Mostly its ratio occurs in female because of amendments or fluctuation in hormones (menopause), and mostly individual with diabetes are more frequent to adhesive capsulitis.^{[6], [7]} Prolonged duration of inactivity due to any operation, injury, immobilization, illness, stroke could lead to capsulitis in shoulder. Patient may be susceptible to an inflammation that cause stiffness in periphery area of joint.^[8] Management of adhesive capsulitis can be proceeding through physiotherapy exercises sessions, steroid injection, manipulation of shoulder and surgery to stop this condition and Moving towards improvements.^{[9], [10]} Mobilization of joint is the mostly used to manage adhesive capsulitis individual, which

include oscillatory procedure anticipated by means of Maitland and the continuous stretch procedure presented via mean of Kaltenborn(KM). These both techniques are likewise passive techniques; however, they are different that in a sense that Maitland mobilization (MM) is a customs oscillation however kaltonborn follows continuous stretching. MM having different grade vary from 1-4, its grade depends on intensity of oscillation, as grade 1 having mild insanity of oscillation and its intensity increases as grade increased, whereas KM is classified into 1-3 grade which vary due to intensity of applying passive sustained stretch. ^[11] A study comparison of Maitland and Kaltonborn mobilization techniques for improving shoulder pain and range of motion in frozen shoulder conducted by Do MOON et.al. in 2015 and they analyses in their research that both techniques Kaltonborn and Maitland was effective for decreasing pain and increasing range of motion. So, they recommend both techniques for management ^[12]. A research in 2016 comparing and determines the effect of kaltonborn mobilization effect in adhesive capsulitis patient conducted by Junaid et al. and their result revealed that kaltonborn technique is effective in pain and refining ADL's and eliminating pain in combination with other physiotherapy session ^[13]. In 2017 Shruti Naik, Santosh Metgud and Anand Heggannavar research result shows that Maitland mobilization is effective in treating the patient of frozen shoulder for reducing pain and increasing range of movement ^[14]. The purpose of the study is to evaluate the effect of Maitland and Kaltonborn Mobilization for decreasing pain and disability which cause upsurge range of movement in subject of adhesive capsulitis. As in frozen shoulder there is limitation in ranges that are flexion, abduction, extension, internal rotation having pain and difficult to do overhead activity.

2. Materials and Method.

It was randomized control trail study. The study was conducted in Physiotherapy department of Mayo Hospital, Lahore from 10 May, 2018- 10 November,2018.A total of 40 subjects were enrolled in this study. Simple random sampling techniques was used for allotment of equal number of subjects in to the groups.Subjects in Group 1 treated with Kaltonborn Mobilization and subjected enrolled in Group 2 treated with Maitland Mobilization. Subjects were randomly allocated into two groups via lottery method. Folded cards were placed in a box with labeling as group 1 or group 2. Patient chose the enlisted card and enrolled in respective group. Informed consent form and inclusion, exclusion criteria considered before enrolling subject in to the study. Inclusion criteria include patient identified with adhesive capsulitis with limited range of motion, having pain and limitation of activity of daily living, age group 35-70 year, both genders were included, subject who willing to participate and History of shoulder arthritis, rotator cuff and ligament injuries, Malignancy, Peri arthritis shoulder are considered in exclusion criteria. Tools used inthe study was Numeric pain rating scale for assessing the intensity of pain, and SPADI Index for assessing the disability that is limiting activity of daily living. All procedure was explained to the subject before treatment, Written consent form were taken from the all enrolled subjectand data were kept confidential. Self-made questionnaire was used, which was consisting of three parts. Part I of the questionnaire was based on the demographic data including name, age, sex, occupation, and

address disease, inclusion and exclusion criteria. Part II consists of Numeric pain rating scale and Spadi index and Part III consist of post treatment reading. When applying Maitland mobilization patient position was supine, and therapist stand on the effected side, stabilize the joint by grasping arm from one hand and then apply traction from other hand then apply oscillatory gliding mobilization. While in Kaltonborn patient position was supine, and therapist stand on the effected side, stabilize the joint by grasping arm from one hand and then apply traction from other hand then apply sustained gliding mobilization. Grade 3 of KM and MM was used. During treatment session both groups received ultrasound in continuous mode for 10 minutes plus exercises for shoulder (shoulder wheel exercise, pulley rope and wall climbing exercises). Each technique was performed subsequently. Treatment session consist of 3 weeks and each week having 3 session. All data of the subjects were collected pre and post treatment and noted for statistical analysis.Data were entered in spss-23. Data normality was tested by Shapiro-wilk test. Quantitative analysis was accessible as mean ± SD and Qualitative analysis like gender were analyzed via frequency& percentages.For comparison between pain and SPADI before and after within the group Wilcoxon sign test was used and between two different groups Man Whitney U-test was applied, p-value ≤ 0.05 was taken as significance.

3. Statistical analysis:

The mean and Standard deviation of age of the participants of this study is 48.95± 7.841 (Table.1)

Table 1: Descriptive Statistics of Age.

| Age | Number | Mean ± S.D |
|-----|--------|--------------|
| | 40 | 48.95± 7.841 |

Table 2: Test of Normality

| | Shapiro-Wilk | |
|-------|--------------|-------|
| | Statistics | Sig |
| Pain | 0.623 | <0.01 |
| SPADI | 0.818 | <0.01 |

Data normality was assessed through shapiro-wilk test and Table 2 shows the distribution of data (Pain + SPADI index) was non-parametric. So, Wilcoxon sign test was applied within the group pre and post treatment Analysis while Man Whitney U test was applied between the groups.

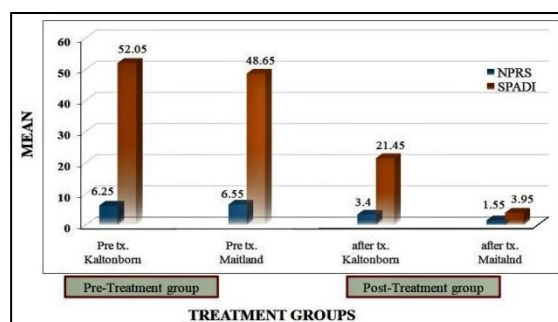


Figure 1: Mean of both groups

There was significant difference in pain and SPADI index(disability) before and after treatment in both groups, $p < 0.05$ (table 3). There was significant difference in pain and SPADI index after the treatment in both groups, $p < 0.05$ (table 4).

Table 3. Wilcoxon sign Test of Both Groups Before and After Treatment

| Treatment group | Parameters | Mean Difference | P-value |
|-----------------|------------|-----------------|---------|
| Kaltonborn | NPRS | 2.85±1.15 | <0.01 |
| | SPADI | 30.6±5.68 | <0.01 |
| Maitland | NPRS | 5.00±0.24 | <0.01 |
| | SPADI | 44.7±1.47 | <0.01 |

Table 4. Man Whitney u test between two groups

| Variables | Groups | Mean± S.D | P-value |
|---------------------|------------|-------------|---------|
| Pain before Rx | Kaltonborn | 6.25±0.44 | 0.56 |
| | Maitland | 6.55±0.51 | |
| Pain after 3 weeks | Kaltonborn | 3.4000±1.60 | 0.001 |
| | Maitland | 1.55±0.75 | |
| SPADI before Rx | Kaltonborn | 52.05±6.38 | 0.06 |
| | Maitland | 48.65±3.86 | |
| SPADI after 3 weeks | Kaltonborn | 21.45±12.06 | <0.01 |
| | Maitland | 3.95±2.39 | |

And means difference of pain and Spadi after shows that both techniques were effective in managing the patient of adhesive capsulitis, but Maitland seems to be more effective as compared to Kaltonborn (figure 1).

4. Discussion

The aim of the study is to describe the effect of Kaltonborn and Maitland mobilization to diminution of pain and lessening debility and rally the ADL's in Frozen shoulder. The result indicates that MM and KM they both are effective in adhesive capsulitis, but MM show significant result as compared to KM for reducing pain and improving ADL's by decreasing the disability. However, in 2017 **Shruti Naik, Santosh Metgud and Anand Heggannavar** revealed in their research work that Maitland mobilization was effective in frozen shoulder for reducing pain and improving activity of daily living^[14]. Do MOON and his colleague in 2015 conducted a study on comparison between kaltonborn and Maitland in frozen shoulder and this study conclude that these both technique were effective in decreasing pain and gaining ADL's as they recommend both techniques for managing Frozen shoulder^[12], this work also support our study and result of these study support findings of the research result, and in favor of study directed in 2015 which shows that mean and standard deviation of NPRS and SPDAI before treatment was 6.25±0.44 and 52.05±6.38 in kaltonborn while in Maitland was 6.5500±0.51042 and 48.65±3.86. After treatment in kaltonborn it was 3.40±1.60 and 21.45±12.06 and in Maitland it was 1.55±0.75 and 3.9500±2.39462. This result revealed that there was significant difference in pain and SPADI index after the treatment in both groups, but Maitland was more effective as compared to Kaltonborn. P-value was 0.000 which was ≤

0.05. This research outcome clinched that subject of frozen shoulder managed with Kaltonborn and Maitland Mobilization they both are useful in decreasing ache, gaining ROM and refining action of everyday. Nevertheless, subject managed with Maitland practices had revealed noteworthy outcome which shows that Maitland was more effective than Kaltonborn Mobilization.

5. Conclusion

This study concludes that both techniques were effective in decreasing pain and disability by improving activity of daily living but Maitland show remarkable results as compared to Kaltonborn mobilization.

6. Recommendation

For future study there must be well arranged environment with longer duration with extended follow up duration, longer treatment session and with large amount sample size

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