

## Comparing the Effectiveness of Kaltenborn Mobilization and Cyriax Manual Therapy in Patient of Diabetic Adhesive Capsulitis

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### Abstract

**Background:** Adhesive capsulitis is also called frozen shoulder. It's a pathology in which patient suffer from pain, stiffness and loss of movements. It's mostly occurred in the age between 40 - 60 years and its ration of occurrence is more in female as compared to male. Kaltenborn mobilization is a manual technique which is used to gain range of motion and decreasing the pain. In Kaltenborn mobilization traction and glide is applied in the shoulder. Deep frictional message is also called deep transverse friction which is include in Cyriax manual therapy and named with James Cyraix. Deep frictional message is a technique of messaging a connective tissue that is quietly applied on soft tissue (muscle, tendon, musculotendinous joints, joint capsule of ligaments). Message is applied in transverse direction on the lesion fiber via fingers.

**Main Objective:** To compare the effectiveness of Kaltonborn Mobilization and Cyriax manual therapy in patients of diabetic adhesive capsulitis.

**Methods:** Design of the study was single blinded randomized control trial; simple random sampling technique was used to collect the data. 48 patients were randomly allocated in the study suffering from diabetic adhesive capsulitis stage 2. Patient were allocated into 2 groups, Group A (n = 24) treated with Kaltenborn Mobilization and Group B (n = 24) were treated with Cyriax manual therapy, and baseline treatment was provided to both groups which include hot pack, exercises. Data was collected from Physiotherapy Department Laeeque Rafiq Hospital, Multan. Study duration was consisting of 6 months from February-August 2016.

**Results:** The outcomes revealed that there was statistically significant difference with in the group. While comparison between 2 groups, Kaltenborn shows more statistically significant result as compared to Cyriax manual therapy. P-value was < 0.05 for reducing pain and disability.

**Conclusion:** This study concluded that Kaltenborn and Cyriax manual therapy both were effective for treating the patient of adhesive capsulitis for reducing pain and disability, but Kaltenborn mobilization shows more significant result as compared to cyriax manual therapy.

**Keywords:** Adhesive Capsulitis; Kaltenborn Mobilization; Cyriax Manual Therapy

### Introduction

Adhesive capsulitis is also called frozen shoulder. It's a pathology in which patient suffer from pain, stiffness and loss of movements [1]. It's mostly occurred in the age between 40 - 60 years and it's ration of occurrence is more in female as compared to male [2]. In adhesive

capsulitis adhesion occur due to inflammation in the joint [3]. It mostly occurs in diabetic patients and influence 10 - 20% diabetic people [4]. In outer shoulder area aching or dull pain occur, sometimes it also migrates to upper arm also. Loss of active and passive movement occur which lead to restriction in movements [5]. Adhesive capsulitis having 3 stages. Its first phase is called pre-freezing, its occurrence duration is from first to several months with limitation in movements and continues pain. In night pain is acute. Freezing is second stage, its duration is from 3 - 9 months with increased pain intensity with progressive loss of movements, which lead to disturbance in sleep. Frozen is third stage which last from 9 to 14 months with pain dissipation and restriction in motion. Last and fourth stage is called Thawing in which pain intensity decrease and ranges recover, it's basically an improving phase. Restoration of movement occur in this phase [6]. Kaltenborn mobilization is a manual technique which is used to gain range of motion and decreasing the pain. In Kaltenborn mobilization traction and glide is applied in the shoulder. Gui Do Moon conclude in his study that Kaltenborn mobilization is also effective for increasing the range of movements and decreasing the pain intensity [7]. Deep frictional message is also called deep transverse friction which is include in Cyriax manual therapy and named with James Cyriax [8]. Deep frictional message is a technique of messaging a connective tissue that is quietly applied on soft tissue (muscle, tendon, musculotendinous joints, joint capsule of ligaments). Message is applied in transverse direction on the lesion fiber via fingers [9]. The objective of the study was to determine the effect of Kaltenborn Mobilization and Cyriax manual therapy in patient of diabetic adhesive capsulitis stage 2 in gaining ROM, improving activity of daily living and decreasing pain. And there is a limitation of comparison between these both techniques and improving activity of daily living in adhesive capsulitis.

### Patients and Methodology

Design of the study was single blinded randomized control trial; simple random sampling technique was used to collect the data. 48 patients were randomly allocated in the study suffering from diabetic adhesive capsulitis stage 2. Patient were allocated into 2 groups, Group A (n = 24) treated with Kaltenborn Mobilization and Group B (n = 24) were treated with Cyriax manual therapy, and baseline treatment was provided to both groups which include hot pack, exercises.

### Data collection procedure

Data was collected from Physiotherapy Department Laeeque Rafiq Hospital, Multan. Study duration was consisting of 6 months from February-August 2016. Patient enrollment or allocation is shown in consort flow chart considering consort criteria [10].

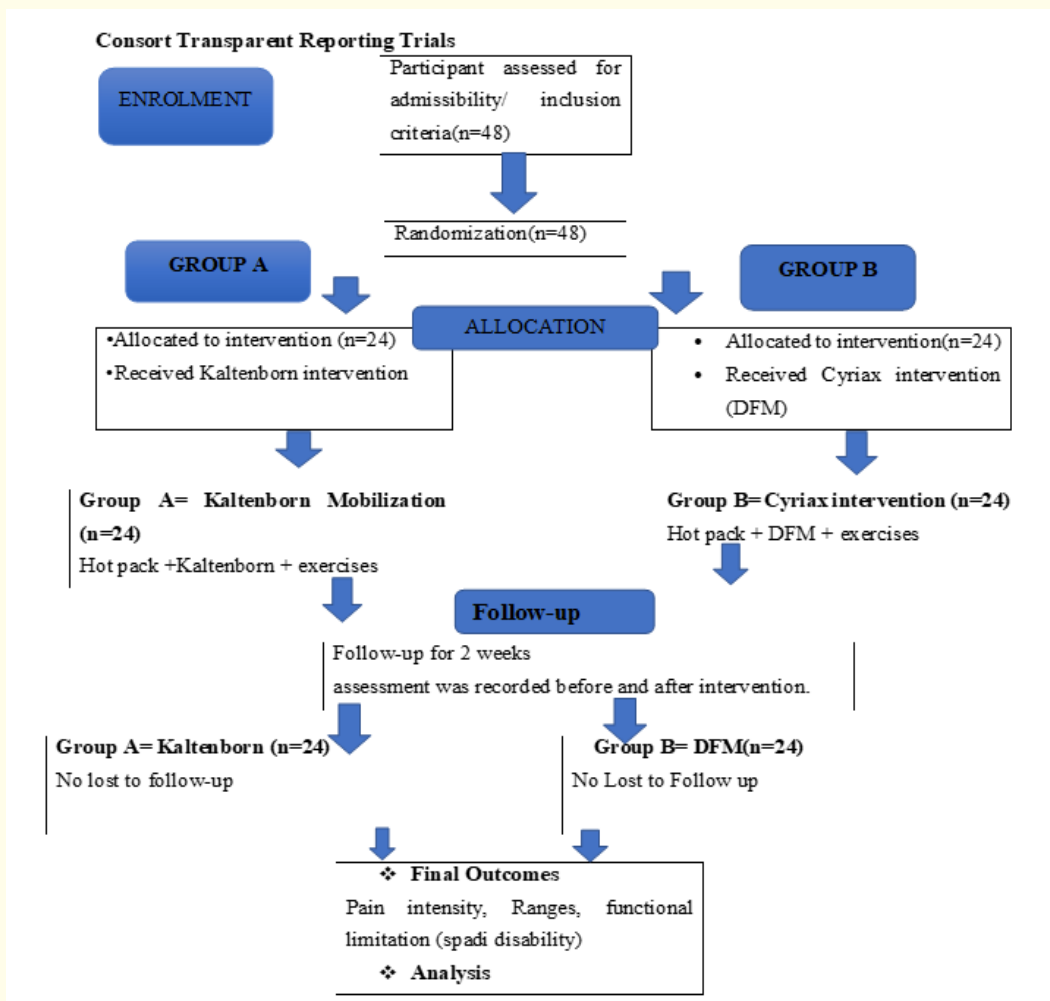
Patient enrollment in study was done while considering the inclusion and exclusion criteria. Inclusion criteria include, patients suffer from frozen shoulder in stage 2, diabetic in nature, having an age between 30 - 60 and limited ROM. Patients with overuse injuries, suffering from arthritis, malignancy in shoulder, unstable shoulder were excluded in the study [11]. Informed consent was taken from the patient prior to study. After taking consent from the subject they were allocated in the group randomly via lottery method. After enrolling them in the group data has been collected from physiotherapy department Laeeque Rafiq Hopital, Multan. Spadi index [12], numeric pain rating scale [13] were used as parametric scale for assessing pain and disability. Assessment is recorded before and after the treatment session. Duration of the treatment was 2 week and consist of 5 session per week. Total 10 session was conducted [14].

### Statistical analysis

For statistical analysis spss22 version was used. Means, standard deviation and frequencies was presented through quantities data. Paired t-test and independent t-test was used to analyze the effect of these two different techniques. Independent t-test was used to analyze the comparison between these two groups, while paired t-test was used to analyze that effect within the group.

### Result

In group A patients mean age was  $49.87 \pm 8.76$  with minimum age 35 and maximum age 60 years. While in Group B mean age of patients was  $47.37 \pm 6.77$  with minimum age 35 and maximum age 60 years.



Figure

	Group	Mean	Standard Devi	N	P-value
NPRS (pre)	Group A	8.54	0.50	24	< 0.003
	Group B	8.45	0.50	24	
NPRS (Post)	Group A	1.75	0.94	24	
	Group B	2.83	1.34	24	

**Table 1:** NPRS between both group pre and post treatment.  
NPRS: Numeric Pain Rating Scale,  $p < 0.05$  is consider significant.

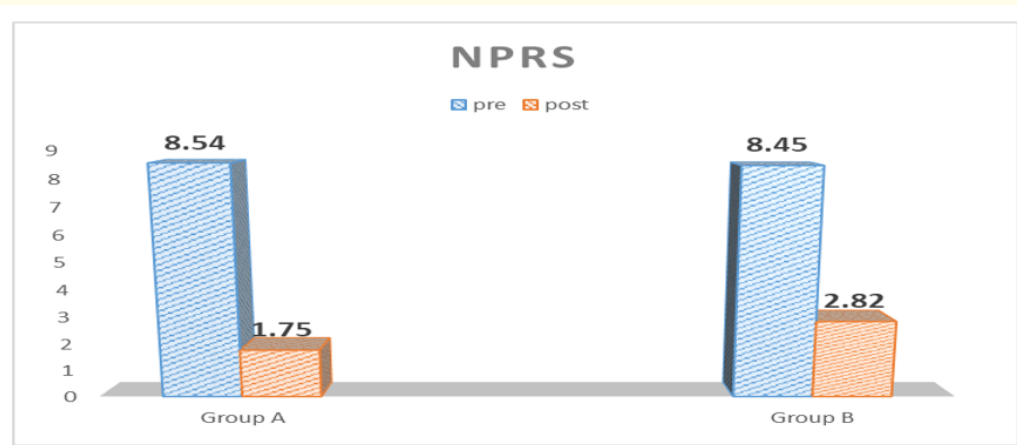


Figure 1: NPRS between both group pre and post treatment.

For numeric pain rating scale as shown in above table, Group A (Kaltenborn mobilization) shows mean value and standard deviation before treatment is  $8.54 \pm 0.50$ , while in Group B (DFM) shows mean and standard deviation is  $8.45 \pm 0.50$ . After 2 weeks of treatment (10 session) group A having mean and standard deviation  $1.75 \pm 0.94$  while in group B it is  $2.83 \pm 1.34$  as shown in the figure. For NPRS result revealed that there was remarkable difference between post and pre assessment scores in both groups. As  $p < 0.003$  which is less than  $p = 0.05$  and it shows that both techniques were effective, but Kaltenborn mobilization was more effective as compared to deep frictional massage, so we reject our null hypothesis and accept our research hypothesis.

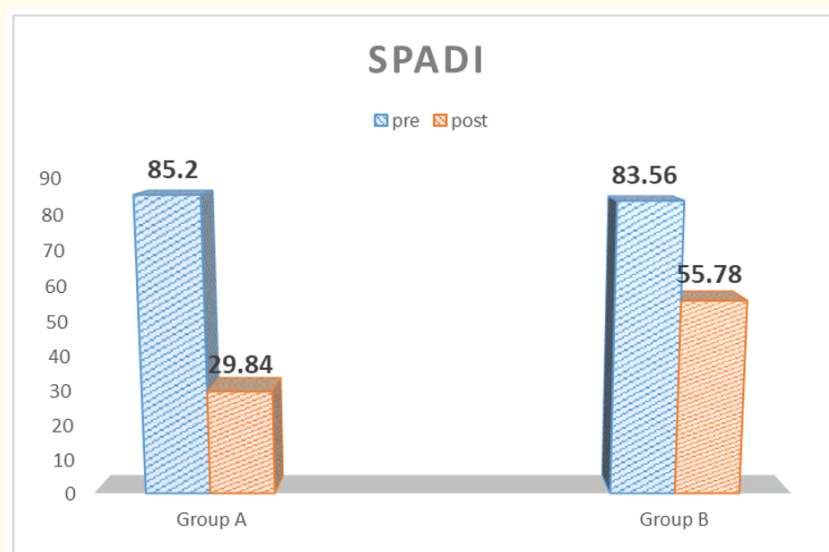


Figure 2: SPADI between both group pre and post treatment.

	Group	Mean	Standard Devi	N	P-value
SPADI (pre)	Group A	85.20	4.52	24	< 0.001
	Group B	83.56	4.09	24	
SPADI (Post)	Group A	29.84	10.21	24	
	Group B	55.78	5.86	24	

**Table 2:** SPADI between both group pre and post treatment.  
 SPADI: Shoulder Pain And Disability Index,  $p < 0.05$  is consider significant.

For shoulder pain and disability index as shown in above table, Group A (Kaltenborn mobilization) shows mean value and standard deviation before treatment is  $85.20 \pm 4.52$ , while in Group B (DFM) shows mean and standard deviation is  $83.56 \pm 4.09$ . After 2 weeks of treatment (910session) group A mean and standard deviation is  $29.84 \pm 10.21$  while in group B it is  $55.78 \pm 5.86$  as shown in the figure. For SPADI result revealed that there was remarkable difference between post and pre assessment scores in both groups. As  $p < 0.001$  which was less than  $p = 0.05$  and it shows that both techniques were effective, but Kaltenborn mobilization was more effective as compared to deep frictional message, so we reject our null hypothesis and accept our research hypothesis.

**Discussion**

The aim of present study is to evaluate the effect of Kaltenborn mobilization and deep frictional message for improving the activity of daily living, decreasing pain and gaining ROM in diabetic adhesive capsulitis. In this comparative study result shows that both techniques are effective for treating the patient of adhesive capsulitis, but Kaltenborn mobilization show beneficial result as compared to deep frictional message.

There was a limited evidence that suggest that Kaltenborn mobilization and Cyriax manual therapy also had beneficial effect for reducing pain and improving activity of daily livings.

A study was conducted and aim of the study was to find the effectiveness of MWM and Kaltenborn mobilization in adhesive capsulitis. 30 patients were randomly allocated into 3 groups. Objective of the study was to analyze the effect of pain, ROM and functionally activity. For its assessment they use SPADI score and Goniometer. Data was collected for 3 weeks. And data was collected pre and post treatment. And they conclude in their study that MWM and Kaltenborn both were effective for reducing pain, ranging range of motion and improving functional activity [15].

Similarly, our study result is supported by above study. In our current study Group, A (Kaltenborn mobilization) shows mean value and standard deviation before treatment was  $85.20 \pm 4.52$ , while in Group B (DFM) shows mean and standard deviation was  $83.56 \pm 4.09$ . After 2 weeks of treatment (10 session) group A having mean and standard deviation was  $29.84 \pm 10.21$  while in group B it was  $55.78 \pm 5.86$ . For NPRS result revealed that there was remarkable difference between post and pre assessment scores in both groups. As  $p < 0.003$  which was less than  $p = 0.05$  and it shows that both techniques were effective, but Kaltenborn mobilization was more effective as compared to deep frictional message. For shoulder pain and disability index, Group A (Kaltenborn mobilization) shows mean value and standard deviation before treatment was  $85.20 \pm 4.52$ , while in Group B (DFM) shows mean and standard deviation was  $83.56 \pm 4.09$ . After 2 weeks of treatment (10 session) group A mean and standard deviation was  $29.84 \pm 10.21$  while in group B it was  $55.78 \pm 5.86$ . As  $p < 0.001$  which was less than  $p = 0.05$  and it shows that both techniques were effective, but Kaltenborn mobilization was more effective as compared to deep frictional message.

Another study conducted by Waqar Ahmad., *et al.* and purpose of his study was to analyze the effects of Kaltenborn mobilization grade 1 and 2 for shoulder range of movements in adhesive Capsulitis. 60 individuals were randomly allocated into two groups who were suf-

ferred from limited ROM and pain. Group A (n = 30) treated with Kaltenborn mobilization grade 1 and 2 with TENS, hot pack and home exercise and group B (n = 30) patients were treated with TENS, hot pack and home exercise. And they conclude in their result that Kaltenborn mobilization grade 1 and 2, TENS, hot pack and home exercise was more effective in producing immediate effects as compared to TENS, hot pack and home exercise in treating the patient of adhesive capsulitis [16].

This study shows that these both techniques were effective in reducing pain, gaining range of motion and improving activity of daily living in patient of adhesive capsulitis stage 2. As shown by p-value (NPRS = < 0.003, SPADI = <0.001)

### Conclusion

It was concluded that Kaltenborn mobilization was statistically and clinically more effective in improving functional activity and reducing pain in frozen shoulder patients as compared to deep frictional massage.

### Bibliography

1. Guyver P, et al. "Frozen shoulder-A stiff problem that requires a flexible approach". *Maturitas* 78.1 (2014): 11-16.
2. Zreik NH, et al. "Adhesive capsulitis of the shoulder and diabetes: a meta-analysis of prevalence". *Muscles, Ligaments and Tendons Journal* 6.1 (2016): 26.
3. Jain TK and Sharma NK. "The effectiveness of physiotherapeutic interventions in treatment of frozen shoulder/adhesive capsulitis: a systematic review". *Journal of Back and Musculoskeletal Rehabilitation* 27.3 (2014): 247-273.
4. Shaheen F, et al. "Physiotherapy management of frozen shoulder associated with diabetes mellitus". *Rawal Medical Journal* 42.2 (2017): 273-275.
5. Lokesh M, et al. "Comparision of effectiveness of the combination of muscle energy techniques and conventional physiotherapy over conventional physiotherapy alone in periarthritits of shoulder: A randomized study". *Journal of Evolution of Medical and Dental Sciences* 4.4 (2015): 545-555.
6. Jason JL, et al. "Physiotherapy interventions for adhesive capsulitis of shoulder: A systematic review". *International Journal of Physiotherapy and Research* 3.6 (2015): 1318-1325.
7. Do Moon G, et al. "Comparison of Maitland and Kaltenborn mobilization techniques for improving shoulder pain and range of motion in frozen shoulders". *Journal of Physical Therapy Science* 27.5 (2015): 1391-1395.
8. Shivakumar H, et al. "A comparative study between the efficacies of ultrasound therapy with cryokinetics versus ultrasound therapy with soft tissue massage (deep friction massage) in acute supraspinatus tendinitis". *Journal of Evolution of Medical and Dental Sciences* 3.15 (2014): 3898-3908.
9. Neha B, et al. "The Effect of Cyriax And Myofascial Release In Adhesive Capsulitis-A Comparative Study".
10. Jull A and Aye PS. "Endorsement of the CONSORT guidelines, trial registration, and the quality of reporting randomised controlled trials in leading nursing journals: a cross-sectional analysis". *International Journal of Nursing Studies* 52.6 (2015): 1071-1079.
11. Yeole UL, et al. "Effectiveness of movement with mobilization in adhesive capsulitis of shoulder: Randomized controlled trial". *Indian Journal of Medical Research and Pharmaceutical Sciences* 4.2 (2017): 1-8.
12. Thoomes-de Graaf M, et al. "The Dutch Shoulder Pain and Disability Index (SPADI): a reliability and validation study". *Quality of Life Research* 24.6 (2015): 1515-1519.

13. Eriksson K., *et al.* "Numeric rating scale: patients' perceptions of its use in postoperative pain assessments". *Applied Nursing Research* 27.1 (2014): 41-46.
14. Gopinath Y., *et al.* "Effect of Gong's Mobilisation versus Muscle Energy Technique on Pain and Functional Ability of Shoulder in Phase II Adhesive Capsulitis". *Journal of Clinical and Diagnostic Research* 12.9 (2018).
15. Ragav S and Singh A. "Comparison of Effectiveness of Mulligan 'MWM' Technique versus Kaltenborn Mobilization Technique on Pain and End Range of Motion in Patients with Adhesive Capsulitis of Shoulder Joint: A Randomized Controlled Trial". *Journal of Exercise Science and Physiotherapy* 15.1 (2019).
16. Awan WA., *et al.* "Effectiveness of grade I, II kaltenborn mobilization in stage I adhesive capsulitis". *The Rehabilitation Journal* 1.1 (2017): 4-8.

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