ORIGINAL ARTICLE

Comparing the effectiveness of Mulligan mobilization versus Cyriax approach in the management of patients with subacute lateral epicondylitis

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Abstract

Objective: To determine the effectiveness of Mulligan mobilisation versus Cyriax approach in the management of patients with subacute lateral epicondylitis.

Methods: The clinical trial was conducted at the District Headquarter Hospital, Bahawalnagar, Pakistan, from September to December 2018, and comprised lateral epicondylitis patients having symptoms for >2 weeks. The diagnosis was confirmed on the basis of physical tests and musculoskeletal ultrasound. The subjects were randomly allocated to two equal groups A and B. Group A received deep transverse friction and Mill's manipulation according to Cyriax approach, while group B received Mulligan mobilisation with movement techniques. Patient-related tennis elbow evaluation index was used to collect data which was analysed using SPSS 20.

Results: Of the 60 patients, there were 30(50%) in each of the two groups. The overall mean age was 35.27±7.30 years, and 38(63.3%) participants were male. After 4 weeks of treatment sessions, both groups showed significant improvements ($p<0.05$) in pain and functional disability scores. Group A showed significantly more improvement ($p<0.05$) in pain subscale scores compared to group B, while group B showed significant improvement ($p<0.05$) in functional disability subscale scores compared to group A. There was no significant difference ($p>0.05$) between the groups on total the patient-related tennis elbow evaluation index score.

Conclusion: Both Mulligan mobilisation with movement and Cyriax approach decreased pain and improved functional status in lateral epicondylitis patients.

Keywords: Elbow, Lateral epicondylitis, Massage, Mobilisation, Physiotherapy. (JPMA 71: 12; 2021)

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Introduction

Lateral epicondylitis (LE), also known as tennis elbow or lateral epicondylalgia, is a common musculoskeletal disorder of the elbow joint.[1] Studies have reported 1.6% to 23.1% LE prevalence in workers involved in repetitive upper extremity activities while life-time prevalence of LE in tennis players ranges 40-50%.[2,3] Though it is less common in general population and it affects only 1-3% population, it is associated with incredible costs and human sufferings.[2,4]

Contractile overload that chronically stresses the tendon near the attachment on the humerus is the primary cause of epicondylitis.[1] In literature, different invasive and non-invasive treatment protocols have been proposed for LE management.[5] In non-invasive treatment options, physical therapy modalities, such as myofascial release, therapeutic ultrasound, mobilisation and taping, are most commonly used for LE management.[6]

Mulligan mobilisation with movement (MMWM) is a form of manual therapy that includes a sustained lateral glide to the elbow joint with concurrent physiological movement.[7] Contrary to traditional mobilisation techniques in which mobilisation is applied in static condition, MMWM emphasises on mobilising the joint during physiological movement. Studies have reported that MMWM is effective in reducing pain and improving functional status of the elbow joint in LE patients.[7,8]

Cyriax approach (CA) incorporates deep transverse friction (DTF) massage followed by Mill's manipulation, which is performed immediately after DTF massage.[9] The application of DTF massage produces therapeutic benefits by breaking down the adhesions between repairing connective tissue and surrounding tissues, thus softening the scar tissue and mobilising the cross-links between the mutual collagen fibres.[10] Moreover, DTF massage produces vasodilatation and increased blood-flow to the affected area. This facilitates the removal of chemical irritants and increases the transportation of endogenous opiates, resulting in a decrease in pain.[11]

Despite the fact that MMWM and CA are commonly used in clinical settings for LE management, evidence regarding the effectiveness of one over the other is scarce. Though preliminary studies regarding MMWM and CA have shown

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promising results in LE management, robust evidence regarding both the techniques is lacking. The current study was planned to determine the effectiveness of MMWM and CA in the management of patients with subacute LE.

Patients and Methods

The clinical trial was conducted at the District Headquarter Hospital (DHQ), Bahawalnagar, Pakistan, from September to December 2018. After approval from the ethics review committee of Isra Institute of Rehabilitation Sciences (IIRS), Isra University, Islamabad campus, the sample size was calculated using an online calculator[12] with 80% power (1 – beta or % chance of detecting).[13] The sample was raised using purposive sampling technique in the initial phase. Those included were LE patients of either gender aged 20-50 years having symptoms for >2 weeks. A trained physical therapist with Masters in Orthopaedic manual therapy diagnosed the patients on the basis of physical examination, such as positive Mill's test, Cozens test and Maudsley's test, and local tenderness on palpation over extensor carpi radialis tendon. Reports of musculoskeletal ultrasound were used to confirm the LE diagnosis. Patients with pain intensity >7 on numeric pain rating scale (NPRS), and/or having history of acute trauma, fractures, surgery and/or having any neurological or systemic disease were excluded.

Data was collected after obtaining informed consent from the participants. Envelopes containing equal number of group 'A' and group 'B' labels were placed in a container and the patients were asked to pick one from it. These labelled papers were folded in such a manner that the labelling was not visible to the participants and the physiotherapist.

Patients in group A received DTF massage and Mill's manipulation according to CA for 4 weeks, while group B received MMWM technique for 4 weeks.

Each participant in group A received 12 sessions over 4 weeks. Each session started in sitting position and initially DTF massage was done at the lateral compartment of the elbow joint and immediately after that Mill's manipulation was performed at the elbow joint with wrist in flexed and forearm in pronated positions. Each session lasted 20-30 minutes. The session was repeated three times a week for 4 weeks.

Each patient in group B also received 12 sessions over 4 weeks. Each session started in sitting position and MMWM was performed. Initially, lateral glide at the elbow joint was performed and after holding it, the therapist asked the patient to make a fist and open the fist. The therapist repeated the procedure 36 times in one session. After 12 repetitions, a short rest period was given. Each session lasted 35-45 minutes. The session was repeated three times a week for 4 weeks.

Patient-related tennis elbow evaluation (PRTEE) index was used to evaluate pain and functional disability of LE patients on initial visit and on 1st, 2nd, 3rd and 4th week. The index has two subscales; one for pain and the other for functional disability. In the pain subscale, 5 questions related to pain are scored 0-10. For each question related to pain 0 referred to no pain while point 10 referred as pain worst imaginable. In the functional disability subscale, 10 questions are scored 0-10. For each question related to functional disability 0 referred to no difficulty while point 10 referred to being unable to do. PRTEE is a valid and reliable instrument for LE patients.[14]

Data was analysed using SPSS 20. Shapiro–Wilk test was used to check normality of data, which was found to be not normally distributed, leading to use of non-parametric tests for analysis. For inter-group analysis, Mann Whitney U test was used. $P<0.05$ was considered significant. Because the data was not normally distributed, median and inter-quartile range (IQR) was used to express the data instead of mean and standard deviation.

Results

Of the 60 subjects, there were 30(50%) in each of the two groups. The overall mean age was 35.27±7.30 years, 38(63.3%) of the participants were male, and 54(90.0%) had right LE (Table 1).

Group A showed significant improvement ($p<0.05$) in the pain subscale scores compared to group B, while group B showed significant improvement ($p<0.05$) in functional disability scores compared to group A in 2nd and 3rd weeks of treatment. However, there was no significant difference ($p>0.05$) between the groups on total PRTEE index score across the 4 weeks (Table 2).

Table-1: Demographic information of Participants.

Characteristics	Categories	Group A n (%)	Group B n (%)	Total n (%)
Gender	Male	20 (52.6)	18 (47.4)	38(63.3)
	Female	10 (45.5)	12 (54.5)	22(36.7)
Occupation	Labourer	2(50.0)	2(50.0)	4(6.7)
	Computer work	0 (0.0)	4(100.0)	4(6.7)
	Stitching	6(100)	0(0.0)	6(10.0)
	House wife	2(16.7)	10(83.3)	12(20.0)
	Field work	8(66.7)	4(33.3)	12(20.0)
	Factory work	4(50.0)	4(50.0)	8(13.3)
	Sports	2(100.0)	0(0.0)	2(3.3)
	Others	6(50.0)	6(50.0)	12(20.0)
Affected side	Right	26(48.1)	28(51.9%)	54(90.0)
	Left	4(66.7)	2(33.3)	6(10.0)

Table-2: Between group comparison of Group A and Group B.

Variables	Weeks	Group A Median(IQR)	Group B Median(IQR)	*p*-value
PRTEE index pain subscale score	0 week	34(8)	35(2)	0.27
	1st week	23(16)	29(6)	0.05
	2nd week	12(4)	22(10)	<0.01
	3rd week	9(4)	12(3)	<0.01
	4th week	4(6)	7(2)	<0.01
PRTEE index functional disability subscale score	0 week	71(20)	77(19)	0.86
	1st week	51(24)	57(34)	0.90
	2nd week	39(37)	28(6)	<0.01
	3rd week	24(4)	19(8)	<0.01
	4th week	14(5)	12(13)	0.09
PRTEE index total score (pain+ functional disability score)	0 week	68.5(16.5)	71.50(9.5)	0.63
	1st week	50(26.5)	59.50(22)	0.16
	2nd week	31(18.5)	36(13)	0.58
	3rd week	18(6)	21(3.50)	0.36
	4th week	11(8)	12(6)	0.54

Mann Whitney U test was applied, *p*-value <0.05 was taken as significant; PRTEE: Patient-related tennis elbow evaluation; IQR: Inter-quartile range.

Discussion

LE is a common elbow lesion which is characterised by pain at elbow joint and week grip strength.[15] Weak grip strength and pain due to LE considerably affects quality of life of the patients.[16] For example, simple tasks such as holding a cup of tea or giving a handshake on the affected side are difficult for these patients. Despite the fact that LE is associated with incredible human sufferings, due to its low prevalence in general population, it did not receive much attention from researchers and few studies are available regarding LE in general population.[17] More than 40 treatment approaches have been reported in the management of LE, but none has been proven superior over the rest.[18] Therefore, the current study was designed to determine effectiveness of two MMWM and CA physiotherapy modalities.

Physiotherapy treatment approaches have been reported to be effective in managing LE patients.[19] The current study showed that MMWM and CA were effective in reducing pain and improving functional status in LE patients. Studies have also reported that these physiotherapy techniques are effective in managing LE.[6,7,9,10,13,19-20]

The current study showed CA was more effective in reducing pain compared to MMWM. Stasinopoulos D et al. also reported that DTF massage in combination with Mill's manipulation is effective for managing pain associated with LE.[22] It is also reported that in CA, earlier pain improvement is actually due to massage because it produces vasodilatation and increased blood-flow to the area, which not only causes removal of chemical irritants, but also increases the transportation of endogenous opiods to the affected area.[10,23,24] Brosseau et al. studied DTF massage for the management of patients with tendinitis and concluded that it is the treatment of choice for patients with tendinitis.[23]

MMWM aims at providing mobilisation during movement of the affected joint.[7] It is different from other types of mobilisation techniques because traditional mobilisation techniques, such as Maitland mobilisation, are applied in static position, while MMWM is provided during movement of the joint.[13] This helps in correcting biomechanics of the joint in functional movement.[8] The key result of the current study was that though CA was found to be better in improving pain compared to MMWM, the latter was better in improving functional status of LE patients compared to CA. Studies have also reported that MMWM is effective in improving functional status in LE patients.[4,7,8,13,19,25,26] Because MMWM is provided during functional movement,[8] it can be the reason for better outcomes in functional status in patients in MMWM group compared to patients in CA group.

Due to time limitation and non-availability of LE patients, the sample size of the current study was too small to allow generalisability of the findings. Secondly, time for follow-up of patients was limited due to which long-term effects of the treatment protocols were not noted. As the study was conducted in a clinical setting, it was not possible to control the confounding variables which might have affected the results. Blinding of the therapist to the treatment was not possible, and, therefore, the physical therapists who worked and assessed the patients for this trial were aware of patients' group allocation.

Despite these limitations, the current study was a preliminary study which thoroughly investigated effectiveness of MMWM and CA in the management of LE patients.

Conclusion

Cyriax approach was better for pain management, while Mulligan techniques improved the functional status better in lateral epicondylitis patients.

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Conflict of Interest: None.

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