ORIGINAL ARTICLE

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A Comparative Study to Find out Immediate Effectiveness of Movement with Mobilization Versus Elbow Orthosis on Pain and Grip Strength in Lateral Epicondylitis in Housewives

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ABSTRACT

Background: There are various studies using Mulligan's MWM with or without combining with electrotherapy modalities and proved the efficacy of the technique in immediately decreasing pain and improving grip strength in patients with lateral epicondylitis. Orthotic as a treatment is also proved to be beneficial in decreasing pain and improving grip strength. There is evidence that housewives are prone to develop lateral epicondylitis due to their routine household work. But there is lack of evidence which compare initial effects of MWM and orthosis in housewives bringing up better outcome measures. The purpose of this study is to compare the initial effectiveness of Mulligan's MWM and elbow orthosis on pain and grip strength in housewives with lateral epicondylitis. The aim of the study is to evaluate the effectiveness of Mulligan's MWM technique versus counterforce elbow orthosis in immediately reducing pain and improving grip strength in lateral epicondylitis in housewives.

Methodos: All subjects underwent a pre-treatment examination to assess pain and pain free hand grip strength with the help of outcome measures. Subjects were randomly assigned into two groups, A and B respectively; having 25 subjects in each group. Group A was treated with one session of Mulligan's MWM technique. Group B was treated with Counterforce elbow strap orthosis. Data was assessed pre-treatment and immediately after treatment. Visual Analogue Scale (VAS) and hand grip on Hand Grip Dynamometer (HGD) were used as outcome measures.

Results: Independent t-test was performed to see the effectiveness between Mulligan's MWM and elbow orthosis. For VAS, t = - 2.243 which is significant at 5% level of significance. It has been inferred that VAS decreases more when Mulligan's MWM was applied. For HGD, t = 0.878 which is not significant implying that increase in HGD do not differ remarkably for the two treatments.

Conclusion: It has been recorded from the study that both Mulligan's MWM technique and counter force elbow orthosis produces significant decrease in pain and improvement in grip strength immediately after treatment. It has been seen that Mulligan's MWM is better than counter force elbow orthosis in relieving pain (p = 0.03). Increase in hand grip strength does not differ remarkably in both treatment groups.

Keywords: Movements with mobilizations, Mulligan's mobilizations, elbow bracing, lateral epicondylosis.

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INTRODUCTION

Lateral epicondylitis (LE) or tennis elbow is a complex and painful musculoskeletal condition which is seen both in working and non-working population.[1,2,3] The conditions characterized by lateral elbow pain which increases during gripping or squeezing[4].The maximum pathological changes are seen in the area of Extensor Carpi Radialis brevis tendinous origin.

Lateral epicondylitis (LE) is the second most frequently diagnosed musculoskeletal disorder in neck and upper extremity primary care settings.[5, 6] Dominant side is commonly affected.[7, 8] It is a common cause of elbow pain in general population. It is often experienced by sportsperson and manual workers but not exclusive to tennis players[9]. Work related activities involving repetitive wrist and hand function usually leads to tennis elbow.[10]

LE is a self-limiting condition with 89% of patient reporting decreases in pain at1 year and 40% of diagnosed patient experience prolonged symptoms leading to impaired function.[11] People having history of present or prior tobacco use is associated with increased risk of developing tennis elbow.[12] It affects both males and female equally[13, 14] but it can be more severe and longer lasting in females than males.[15]

Overuse of Extensor carpi radialis brevis(ECRB) muscle by repetitive micro trauma leads to tennis elbow. Extensor digitorum communis muscle may not be involved. In tennis, predominant activity of wrist extensor may precipitate the disease. A 'late', mechanically poor backhand increasing force over extensor muscles is the most common cause of tennis elbow in tennis players. Repetitive flexion-extension or pronation-supination activity and overuse such as twisting a screw driver, lifting heavy object with the palm down, tightly gripping a heavy object, gardening, bowling can cause tennis elbow.[16]

Mulligan movement with mobilization (MWM) are some mobilization techniques which immediately reduces pain and improves function when indicated.[17] The MWM technique is the best treatment option compared to injections.[18] MWM decreases pain immediately after application by producing a hypoalgesic effect.[19] Miller described MWMas primary modality for correction of positional faults of elbow joint complex and found that MWM results in improvement in pain free grip strength (PFGS).[20,21,22] MWM, a lateral glide at the elbow, has been found to have rapid pain-relieving effects and increased grip strength in patients with LE. MWM has better improvement in strength and functional performance than ultrasound.

Another frequently prescribed treatment in lateral epicondylitis is elbow orthotic which produce a counterforce to reduce the load on common extensor tendon, thus reducing pain.[23,24] Orthotic is a mechanical device applied externally to maintain it in anatomical or functional position or to transfer load from one area to another.[25,26] Jensen et al suggested orthotic as a treatment of choice in lateral epicondylitis and concluded that it can be as effective as steroid injection in the early management of lateral epicondylitis.[27]Application of elbow orthotic partially changes the point of force application from the origin of tendon on the lateral epicondyle to the orthosis, thus reducing the stress exerted proximal to the strap during muscle contractions, thereby improves function which can be demonstrated by measurements of pain free grip strength. Pain free grip strength is commonly measured which is a more responsive measure than maximum grip strength to monitor the recovery of patients with lateral epicondylitis.[28,29,30] But there is lack of evidence which compare initial effects of MWM and orthosis in housewives bringing up better outcome measures. The purpose of this study is to compare the initial effectiveness of Mulligan's MWM and elbow orthosis on pain and grip strength in housewives with lateral epicondylitis.

METHODOLOGY

Assessment: After obtaining the informed consent, subjects fulfilling the inclusion and exclusion criteria were recruited for the study. Baseline assessment was done on the basis of primary assessment form. All subjects underwent a pre-treatment examination to assess pain and pain free hand grip strength with the help of outcome measures. Subjects were randomly assigned into two groups, A and B respectively; having 25 subjects in each group. The outcome is measured in terms of pain and hand grip strength using Visual Analogue Scale (VAS) and Hand Grip Dynamometer (HGD) respectively at the beginning and completion of treatment. Group A was treated with one session of Mulligan's MWM technique. Group B was treated with Counterforce elbow strap orthosis. Data was assessed pre-treatment and immediately after treatment.

Group A:

This group consists of 25 subjects who receive treatment. After giving a brief description of the intervention, the subjects received Mulligan's MWM. The intervention session was conducted by

same the physical therapist experienced in this manipulative procedure.

Mulligan's MWM technique:
The subjects were instructed to lie supine with their elbow in full extension and elbow in pronation. The physical therapist used one hand to stabilize the distal end of the humerus on the lateral side just proximal to the elbow joint line while using the other hand to apply a laterally directed glide of the proximal ulna and radius. The hand applying the lateral glide was situated just distal to the elbow joint line on the medial side of the ulna. The glide was painlessly applied. The glide was applied and sustained for 5-10 seconds while the patient performed pain free gripping action. Six repetitions of this technique were performed and the time interval between each technique was maximum 60seconds.

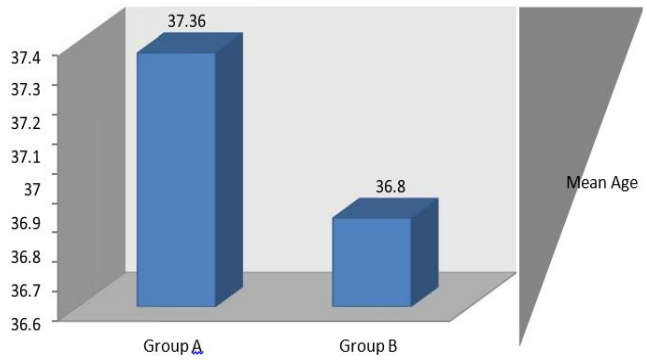
Group B:
This group also consists of 25 patients receiving counterforce elbow strap orthosis. The counterforce elbow strap was an 8-cm-wide neoprene band that incorporated a pressure pad. The strap was positioned 2.5 cm distal to the lateral epicondyle. The subject made a fist and the strap was tightened. The orthosis was considered of suitable size if the subject was comfortable after the fist was released.

Demographic Representation of data:
Demographic information of the study population is outlined in the table below

	Group A	Group B
Age (Mean ± SD)	37.36 ± 7.71	36.8 ± 6.81

Table 1: Mean Age of Patients in Both Groups

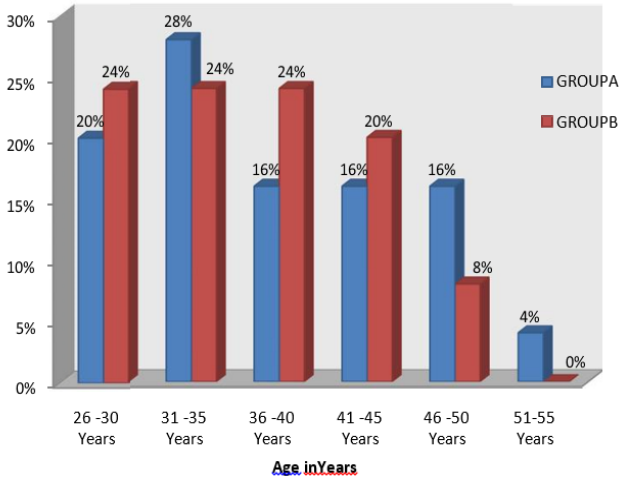
In the study, 50 subjects were selected at random sampling method and then allocated in Group A and Group B.100% of the study subjects was female in both the groups. In Group A, mean age was 37.36 years ranging from 26 to 51 years. In Group B, mean age was 36.8 years ranging from 27 to 52years.



Graph 1: Average age distribution of the housewives in Group A and GroupB

Age	Group A		Group B	
	Frequenc	Percen	Frequenc	Percen
26 - 30Year	5	20.0	6	24.0
31 -	7	28.0	6	24.0
36 -	4	16.0	6	24.0
41 -	4	16.0	5	20.0
46 -	4	16.0	2	8.0
51 - 55	1	4.0	0	0.0
Total	25	100.0	25	100.0

Table 2: distribution of women according to their age



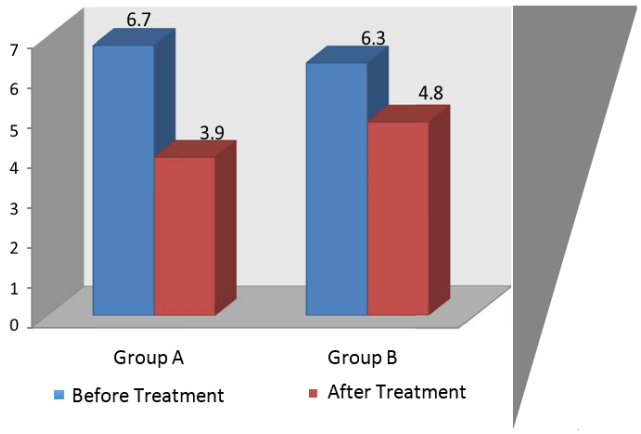
Graph 2: Age distribution of the subjects in Group A and GroupB

Group analysis within groups of Group A and Group B:

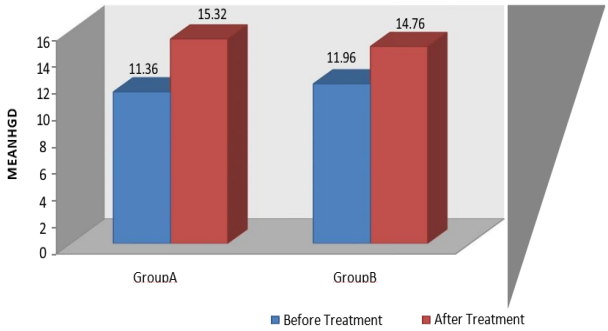
	VAS	Mean ± SD	N	t	df	p
Group A	Before Treatment	6.76 ± 1.234	25	12.96	24	0.00
	After Treatment	3.96 ± 1.541	25			
Group B	Before Treatment	6.32 ± 1.215	25	6.385	24	0.00
	After Treatment	4.84 ± 1.214	25			

Table 3: Data Analysis of VAS between Group A and GroupB

The above table is constructed to see whether VAS was decreased after applying Mulligan's MWM. Pairedt-test was performed to see the significance difference in VAS before and after treatment. It was found that in Group A, t = 12.96 which is highly significant at 1% probability level. We can say that there has been remarkable decrease in VAS. The value of t to find the difference in VAS before and after treatment in Group B was 6.385. This value is highly significant at 1% level. It has been found that VAS decreased significantly. We can conclude that VAS decreased after applying elbow orthosis to the patients.



Graph 3: Mean VAS of Group A and Group B



Graph 4: Mean HGD of Group A and GroupB

	HGD	Mean ± SD	N	T	df	P
Group A	Before Treatment	11.36 ± 2.196	25	-20.24	24	0.00
	After Treatment	15.32 ± 2.056	25			
Group B	Before Treatment	11.96 ± 2.491	25	-12.12	24	0.00
	After Treatment	14.76 ± 2.437	25			

Table 4: Data Analysis of HGD between Group A and Group B

To see the difference in HGD before and after treatment, paired t-test was performed which has come out to be -20.24. This value of t is highly significant at 1% level of significance. We can thereby say that HGD increased significantly after applying Mulligan's MWM.

The table above shows that HGD increased significantly after applying elbow orthosis. The value of t = -12.12 and it is highly significant at 1% probability level.

		N	Mean	Std. Dev.	t	df	P
VAS	Mulligan's MWM	25	3.96	1.541	-2.243	48	0.03
	Elboworthosis	25	4.84	1.214			
HGD	Mulligan's MWM	25	15.32	2.056	0.878	48	0.38
	Elboworthosis	25	14.76	2.437			

Table 5: Comparison for VAS and HGD Between Group A and GroupB

RESULTS

Independent t-test was performed to see the effectiveness between Mulligan's MWM and elbow orthosis. For VAS, t = - 2.243 which is significant at 5% level of significance. It has been inferred that VAS decreases more when Mulligan's MWM was applied. For HGD, t = 0.878 which is not significant implying that increase in HGD do not differ remarkably for the two treatments. The present study was under taken to determine the immediate effects of Mulligan MWM technique and counterforce elbow orthosis in immediately decreasing pain and improvement in pain free grip strength in housewives with lateral epicondylitis.

Data collected through the present study showed significant immediate improvement in pain free hand grip strength and decrease in pain in group A. The patients in group A were treated with Mulligan MWM technique. Results showed significant improvement, when pre- test and post test data were compared.

For another objective of the study, data was recorded in house wives with lateral epicondilitis. The patients in group B were treated with counter force elbow orthosis and results showed significant immediate decrease in pain and improvement in pain free grip strength.

Graphical presentation, which point to overall sense of the study, depicts the same. All the graphs showed significant difference for decrease in pain and improvement in pain free grip strength in group A and group B. The level of mean difference in pretest and posttest shows more decrease in pain in group A than group B. For pain free hand grip strength, the results did not differ remarkably for the two treatments.

DISCUSSION

In the present study of lateral epicondilitis, we tried to assess the immediate decrease in pain and improvement in pain free grip strength using Mulligan MWM technique in one group (group A) and counterforce elbow orthosis in other group (group B). After fulfilling the inclusion and exclusion criteria, 50 patients were assigned into two groups of 25 patients.

Subjects in group A received Mulligan MWM and subjects in group B received Counter force elbow orthosis. Immediately after the treatment session, groupA and groupB were compared using VAS and Hand Grip Dynamometer as outcome measure form ensuring pain and pain free grip strength in housewives with lateral epicondylitis.

It is well established fact that in lateral epicondylitis, pain and decrease in muscle strength

are the most common symptoms which results in limitation in activities of daily living.

In this study, both group showed significant improvement immediately after treatment but mean score of group A for pain showed greater improvement. For pain free grip strength, there was no significant difference between the results of the two groups.

Akram amro et al investigated the effect of a combination of Mulligan techniques and traditional treatment compared with that of traditional treatment alone in patients with lateral epicondylitis and concluded that the combination of Mulligan techniques with traditional treatment leads to better outcomes in treatment of lateral epicondylitis than traditional treatment alone,[31] Abbott et al did a study on the initial effects of an elbow mobilization with movement technique on grip strength in subjects with lateral epicondylotis which revealed that MWM was effective in allowing 92% of subjects to perform previously painful movements pain-free, and improving grip strength immediately afterwards.[32]

Study done by Fahimeh S Jafarian et al revealed that use of counterforce elbow strap or the elbow sleeve orthosis resulted in an immediate increase in pain-free grip strength.[33] Alireza Shamsoddini et al; conducted a study to evaluate the immediate effects of counter force forearm brace on grip strength and wrist extension force in patients with lateral epicondylosis. The study concluded that the counterforce forearm brace increased the rate of grip strength and wrist extension muscle force in patients with lateral epicondylosis.[34]

With all the above findings it has been proved that results of the present study have shown similar results with other studies which have been done using Mulligan movement with mobilization and counterforce elbow orthosis in lateral epicondylitis.

CONCLUSION

It has been recorded from the study that both Mulligan's MWM technique and counter force elbow orthosis produces significant decrease in pain and improvement in grip strength immediately after treatment. It has been seen that Mulligan's MWM is better than counter force elbow orthosis in relieving pain ($p = 0.03$). Increase in hand grip strength does not differ remarkably in both treatment groups.

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