Effect of Soft Tissue Mobilization on Lumbar and Pelvic Posture in Chronic Mechanical Low Back Pain

Samir A., Sabbahi, Ph.D.
Department of Basic Science, Faculty of Physical Therapy, Cairo University.

ABSTRACT

Myofascial release (MFR) is the stretching of the fascia regardless the muscle course. MFR is used to overcome myofascial restriction and therefore muscle spasm with reducing pain and regaining body alignment. Spray-stretch technique (SST) is a passive stretch of the muscle in which the simultaneous application of a vapocoolant spray is administered to the skin overlying the affected muscle. The aim of this study was to investigate the effect of MFR and SST on the lumber and pelvic posture in chronic mechanical low back pain (MBP). Eighty participants participated in this study (42 male and 38 female). Their age ranged between 20-40 year-old. This current study indicated the following: ***1)*** *A combination of both techniques of therapy had the greatest significance in improving AROM and pain reduction in patients with MBP.* ***2)*** *The relationship between lumbo-sacral angle changes towards normal had no relations with improvement of AROM of lumbosacral area or pain perception. MFR had the greater effect than SST on improving motion and reducing pain in patients with MBP.*

Key Words: Mechanical back pain, Myofascial release, Spray and stretch technique.

INTRODUCTION

The fascia has a supporting role of the torso and can be the main source of pain as a response to tension and inflammation. The interrelationship between fascia and muscles in lumber and pelvic areas may cause deviation of lumber and pelvic alignment. The anatomical inter-relationship between fascia and muscles in lumber and pelvic areas creats a conflect estimation to detect the cause of MBP, if it is caused by fascial restriction or muscle spasm[1]. Also the inter-relationship between posture of lumber spine and pelvis is necessary for the physical therapist to treat both parts as one functioning unit[14]. Different techniques for soft tissue have been arisen nowadays in conjunction with other modalities for treatment of muscle-fascia disorders in myofascial pain dysfunction syndrome[15]. This multidisciplinary approach of assessment and treatment demonstrates the importance of treating fascial system as one part of other soft tissue's system. Myofascial release is the stretching of the fascia regardless the muscle course[4]. Spray-stretch technique (SST) is a passive stretch of the muscle in which the simultaneous application of a vapocoolant spray to the skin overlying the affected

muscle[18]. The aim of this study was to investigate the effect of MFR and SST on the lumber and pelvic posture in chronic mechanical low back pain (LBP).

METHODS

Design

It was a 3x4 pretest - posttest with repeated measurement design. The pretest was the base line for all dependent variables. Posttest 1 was recorded after all participants have received six sessions included all evaluations except lumbo-sacral angle (LSA) and arthropometric measurements. Posttest 2 after completion of twelve sessions and included all evaluations except anthropometric measurements.

The dependent variables are pain perception, active range of motion (AROM) (forward flexion and lateral bending), pelvic tilting and lumbo sacral angle LSA. The independent variables are MFR, SST, and MFR and SST.

Pain perception was measured by verbal numerical scale (VNS). Forward flexion and lateral bending of lumber spine was measured by the pleurimeter V-inclinometer. Pelvic tilting was measured by pelvic tilt device. Lumbosacral angle (LSA) was measured via plain lumber spine radiographs.

Sample

Eighty participants participated in this study (42 male and 38 female). Their age was between 20-40 years old. All participants were selected to exclude obese subjects (body mass index not more than 31 Kg/m2), any congenital abnormalities (e.g. sacralization) or structural discrepancy and any other medical problems that may interfere with the findings (colon or kidney problems ...etc.). No participant with any previous lumber operation was selected.

They were equally and randomly grouped into four groups (twenty participants each).

Group 1: (control group). 20 participants in this group received twelve sessions of superficial heat in form of electric heating pad for ten minutes for lumbar and pelvic areas.

Group 2: 20 participants received twelve sessions of MFR for the lumbar and pelvic areas, followed by superficial heat in form of electric heating pad for ten minutes.

Group 3: 20 participants received twelve sessions of SST followed by superficial heat in form of electric heating pad for ten minutes.

Group 4: 20 participants received twelve sessions of MFR and SST, followed by electric heating pad for ten minutes.

MATERIAL, EQUIPMENT AND PROCEDURE

Material

1. Ethylchloride spray
2. Verbal numerical scale (VNS).
3. Plain lumber spine radiograph.

Equipment

Pleurimeter V- inclinometer and pelvic tilt device.

Evaluative Procedure

Verbal Numerical Scale (VNS) was used for assessment of pain. The patient was allowed to choose a number between 1-10 which represent his pain intensity.

Range of motion of lumbar spine.

1. Forward flexion (FF). Participant in stride standing position, the pleurimeter V-inclinometer was supported at the level of L4 L5, and adjusted on zero, while both sides of it's arms were kept in contact with spine through adjustable elastic band. The participant was instructed to lean forward as if

trying to touch the ground with both knees extended.

2. Side bending. From the same previous starting position and after changing the position of the pleurimeter from the central part of the lumbar spine to the lateral aspect of the trunk. The participant was instructed to keep back closed to the wall and to lean sideward as if touching the lateral aspect of the knee with fingers.

Pelvic Tilt. The participant was in stride standing position with back supported against wall. The anterior superior iliac spine (ASIS) on both sides were marked by a greasy pencil. The stand's length of the device was adjusted to suit the height of the participant and the arms were opened to touch the ASIS. The side deviation was detected through the movement of the bubble and the degree of deviation was detected by the pleurimeter.

Measurement of LSA. From the lateral view of the plain lumbar spine radiograph, LSA was calculated by drawing a horizontal line, that meets a line drawn through the superior surface of the sacral base [9].

Treatment Procedure

Electric heating pad. Heat not exceed 50°C as controlled by the attached thermometer for 10 minutes.

MFR: Cross-hand technique was applied for lateral abdominal muscles, quadratus lumborum, erector spinae and latissimus dorsi muscles to stretch the fascia. Positioning the patient in side lying position with a pillow under the patient's hip is to exceed stretch of the fascia. Sustained pressure was applied following the tissue three dimensionally, barrier upon barrier for a minimum of two minutes or until a release occurred. A knuckle stroking technique was applied to stretch the tensor fascia lata and Iliotibial band till the knee. A knuckle was applied around and behind the greater trochanter of the femur for the fascia of piriforms muscle. For the anterior fascia of thigh, the patient was in supine position with the thigh kept in abduction and extension. For psoas release, the patient was in supine position and the therapist stood near the affected side. With the extended fingers, the therapist applied pressure with finger tips, deep into psoas muscle, one inch lateral to umbilicus. The therapist then used a transverse strumming technique on the psoas firmly and carefully throughout its length [3]

SST: This technique was done using Ethylchloride spray over erector spinae, quadratus Lumborum, iliopsoas, tensor fascia lata, Piriformis, gluteus maximus, and hamstring muscles. The muscle was put in a stretched position according to its anatomical direction. The jet stream of spray was applied in slow parallel sweeps from the origin to the insertion of the muscle. As the muscle tension was released the therapist gently increased stretching of the muscle gradually and slowly.

Data Analysis

The statistical analysis of the data were conducted by using analysis of variance (ANOVA), while comparing the values pre and post-test using the t-paired test.

The correlation coeffeicient and its significance between the investigated parameter pre-test, post test 1 (after 6 settings) and post-test 2 (after 12 settings) for the four groups was used.

RESULTS

Pain perception: Table (1) and figures (1) showed the mean and standard deviation of the pain value in the 4 investigated groups. Comparison of the values between the 4 groups was shown using ANOVA while comparing the values pre and post test of each group was shown using the "t" paired test. As regarded the pretest values of pain in the 4 groups showed no significant difference (F=1.804, p>0.1). The statistical analysis of the results of the current study revealed that in *group I:* pain values pre-test correlated significantly with post-test 1 (r = 0.948, P<0.00) and with post-test 2 (r = 0,892, P<0.001).

In group II: pain values pre-test correlated significantly with post-test 1 (r = 0.639, P<0.001), but with post-test 2 was not signifacntly correlated (r = 0.348, P<0.05).

In group III (SST): pain values pre-test scores correlated significantly with post-test 1 (r = 0886, P<0.001), and with post-test 2 (r = 0.789, P<0.001).

In group IV (MFR+SST): pain values in pre-test scores correlated significantly with post-test1 (r = 0.681, P<0.001), but with post-test 2, it was not significantly correlated (r = 0.00, P<0.05).

So, pain reduction was noticed significantly in group IV (MFR+SST) more than in group III and much less in group I (control) in post-test 1 and 2. This means that application of MFR + SST may have a double effect on pain reduction than every technique alone. This may be due to the effects of stretching fascia and muscle on pain receptors [10,3].

Table (1) : Pain assessment in the 4 investigated groups including pre-test, post-test1 and post-test2.

		Group I (Cont.)	Group II (MFR)	Group III (SST)	Group IV (MFR+ SST)	F	P
Pre-test	Mean	6.2750	6.00	6.35	7.025	1.804	>0.1
	S.D	± 1.3130	± 1.606	± 1.615	± 1.219		
Post-test$_1$	Mean	6.0500	4.000	5.575	4.225	6.465	<.001*
	S.D	± 1.7010	± 1.539	± 2.104	± 1.674		
t paired		1.6303	6.6862	3.4444	10.1885		
P		> 0.0500	< 0.001*	< 0.005*	< 0.001*		
% change		↓ 3.5900	↓ 33.300	↓ 12.2	↓ 39.86		
Post-test$_2$	Mean	5.9000	1.475	4.100	0.500	54.928	<.001*
	S.D	± 1.6430	± 1.602	± 1.675	± 0.874		
t paired		2.2104	11.0487	9.4047	19.4566		
P		< 0.0200*	< 0.0010*	< 0.001*	< 0.001*		
% change		↓-5.9800	↓ 75.4200	↓ 35.43	↓ 92.85		
Difference 1	Mean	-0.2250	-2.0000	-0.775	-2.800	23.188	<.001*
	S.D	±0.6170	± 1.3380	± 1.01	± 1.23		
Difference 2	Mean	-0.3750	-4.5250	-2.25	-6.53	78.289	<.001*
	S.D	±0.7590	± 1.8320	± 1.07	± 1.50		

S.D = standard deviation. F ratio = value for one-way analysis of variance (ANOVA)
P = probability. * = Significant

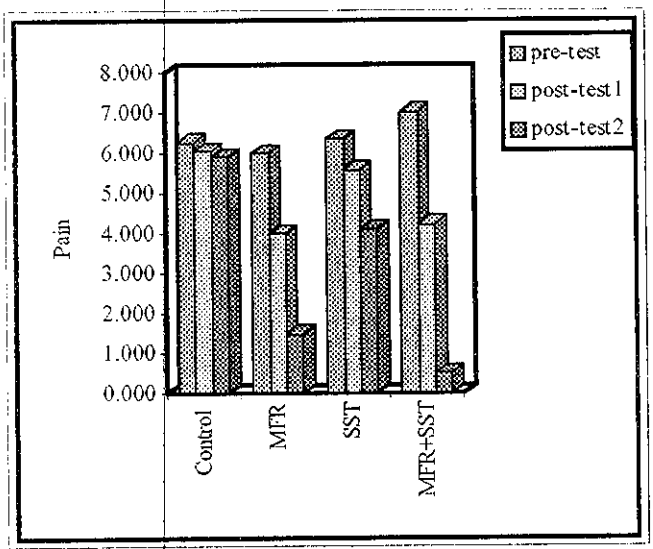

Figure (1) Pain assessment in the four groups including pre-test, post-test1 and post-test2.

Pain reduction is noticed significantly in group IV (MFR+SST) more than in group III and much less in group I (control) in post-test1 and 2. This means that application of MFR + SST may have a double effect on pain reduction than every technique alone.

AROM:

Forward flexion (FF). In group I (control) it was noticed that FF in pre-test values correlated significantly with post-test$_1$ ($r = 0.938$, $P<0.001$) and post-test$_2$ ($r = 0.918$, $P<0.001$). After application of MFR pre-test values correlated significantly with post-test$_2$ ($r = 0.654$, $P<0.005$) and with post-test $_2$ ($r = 0.516$, $P<0.02$). In group III (SST).

Left lateral bending assessment in the four investigated groups shows significant results after post-test$_{1 \text{ and } 2}$ in comaprison with pre-test scores.

Right lateral bending assessment (RLB). Comparison of values between the 4 groups using ANOVA showed nonsignificant results after post-test one ($F=0.84$, $P>0.4$). After completion of twelve settings, (post-test2) showed significant variations toward normlization in group IV more than other groups ($F=38.32$, $P<0.001$).

Thus 6 settings, using the paired t -test, increased the right lateral bending by 10.5%, 35.5%, 17.2% and 51.2% in groups I, II, III and IV respectively.

Table (2) : Forward flexion assessment in the 4 investigated groups including pre-test, post-test1 and post-test2.

		Group I (Con.)	Group II (MFR)	Group III (SST)	Group IV (MFR + SST)	F	P
Pre-test	Mean	35.15	29.55	30.85	34.00	0.587	>0.6
	S.D	± 8.42	± 18.12	± 16.03	± 16.79		
Post-test1	Mean	38.05	49.15	38.75	53.10	6.245	< .001*
	S.D	± 9.21	± 14.61	± 15.53	± 13.65		
t paired		4.04	6.2654	6.4515	6.7026		
P		< 0.001*	< 0.001*	< 0.001*	< 0.001*		
% change		↑ 8.25	↑ 66.3	↑ 25.6	↑106.6		
Post-test2	Mean	39.45 ±	65.5 ±	51.0 ±	70.25 ±	37.027	< .001*
	S.D	8.96	10.25	13.44	4.99		
t paired		5.4085	10.3383	8.007	11.2553		
P		< 0.001*	< 0.001*	< 0.001*	< 0.001*		
% change		↑12.23	↑ 121.7	↑ 65.3	↑106.6		
Difference 1	Mean	2.90	19.6	7.900	19.10	13.87	< .001*
	S.D	± 3.21	± 13.99	± 5.48	± 12.74		
Difference 2	Mean	4.30	35.95	20.15	36.25	31.72	< .001*
	S.D	± 3.56	± 15.55	± 11.25	± 14.40		

S.D = standard deviation. F ratio = value for one-way analysis of variance (ANOVA)
P = probability. * = Significant

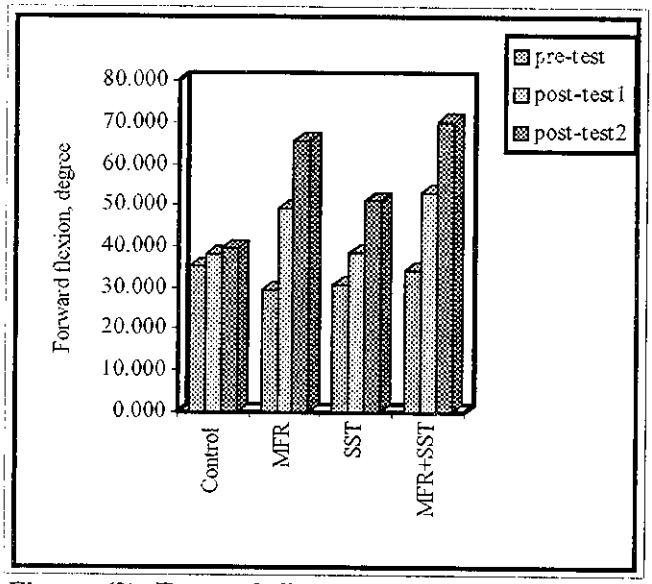

Figure (2) Forward flexion assessment in the 4 investigated groups including pre-test, post-test1 and post-test2.

Pelvic tilt (PT): It was noticed in this study that some patients started treatment with normal pelvic tilting, even there were a loss in FF or R and LLB RROM. Also, most of these patients had a unilateral spasm or fascial restriction in lumber spine, and/or pelvic tilt. PT assessment in the 4 investiogated groups showed a significant improvement after post-test 1 (F=7.043, P<0.001) and post-test 2 (F= 8.48, P<0.001). The percentage decrease in pelvic tilt values were 13.9, 89.6, 78.2 and 98.7 respectively.

The LSA showed more changes in group IV, III, II and I respectively. The explanation of the changes is the same as in FF and LB and pelvic tilt. The changes after application of SST was more than after MFR. This may be due to the effect of relaxation of the superficial; as well as deep muscles in Lumbosacral area followed application of SST.

The correlation study between the values of pre-test and post-test 1 and 2 in pain, forward flexion, right and left lateral bending, pelvic tilt and lumbosacral angle during assessment in the 4 investigated groups showed that a combination of both techniques MFR and SST had the greatest significant effect in improvement of mechanical back pain (MBP). MFR had the second significant effect, SST had the least significant effect in improvement of MBP but more than control group. This is shown in table (3).

Lumbosacral angle (LSA) (Table 3):

Table (3) : Lumbosacral angle assessment in the 4 investigated groups including pre-test, and post-test.

		Group I (Con.)	Group II (MFR)	Group III (SST)	Group IV (MFR + SST)	F	P
Pre-test	Mean	38.00	42.15	42.70	42.65	1.455	> 0.2
	S.D	± 7.75	± 9.10	± 8.49	± 6.47		
Post-test	Mean	37.70	40.15	40.30	38.20	0.773	> 0.5
	S.D	± 7.77	± 8.45	± 8.02	± 5365		
t paired		1.1888	3.9383	6.8388	7.4126		
P		> 0.1	< 0.001*	< 0.001*	< 0.001*		
% change		↓ 0.8	↓ 4.7	↓ 5.6	↓10.4		
Difference	Mean	- 0.300	- 2.00	- 2.400	- 4.45	14.189	<0.001*
	S.D	± 1.13	± 2.270	± 1.57	± 2.68		

S.D = standard deviation. F ratio = value for one-way analysis of variance (ANOVA)
P = probability. * = Significant

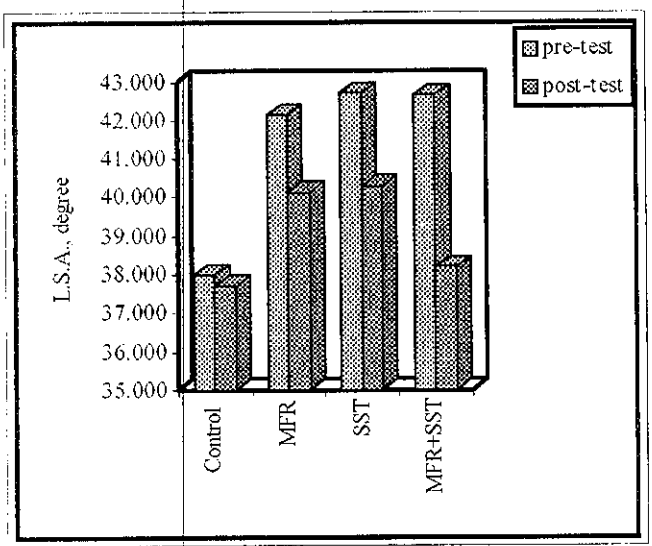

Figure (3) Lumbosacral angle assessment in the 4 investigated groups including pre-test, and post-test.

The results of this study showed that a combination of both techniques MFR and SST had the greatest significant effect in improvement of mechanical back pain (MBP). MFR had the second significant effect in improvement of people with MBP. SST had the least significant effect in improvement of MBP but more than control group.

DISCUSSION

On all dependent variables, application of both techniques, MFR and SST, had a greatest effect than each technique alone. This may be attributed to the double effect of both techniques on inhibition of pain perception AROM and normalization of pelvic posture.

Table (4) : Correlation study between the values of pre-test, post-test1 and post-test2 in pain, forward flexion, right and left lateral bending, pelvic tilt and lumbosacral angle during assessment in the 4 investigated groups.

	Group I (Con.)		Group II (MFR)		Group III (SST)		Group IV(MFR + SST)	
	r	P	r	P	r	P	r	P
1- Pain								
a) pretest with post-test1	0.948	<0.001*	0.639	<0.001*	0.886	<0.001*	0.681	<0.001*
b) pretest with post- test2	0.892	<0.001*	0.348	>0.05	0.789	<0.001*	.000	>0.05
2- Forward flexion								
a) pretest with post-test1	0.938	<0.001*	0.654	<0.005*	0.940	<0.001*	0.667	<0.001*
b) pretest with post-test2	.918	<0.001*	0.516	<0.02*	0.722	<0.001*	0.593	<0.01*
3-Right lateral bending								
a) pretest with post-test1	0.938	<0.001*	0.760	<0.001*	0.888	0.001*	0.556	<0.02*
b) pretest with post- test2	0.804	<0.001*	0.467	<0.05*	0.425	>0.05	-0.064	>0.05
4-Left lateral bending								
a) pretest with post-test1	0.972	<0.001*	0.678	<0.005*	0.927	<0.001*	0.782	<0.001*
b) pretest with post-test2	0.955	<0.001*	0.342	>0.05	0.764	<0.001*	0.144	>0.05
5- Pelvic tile								
a) pretest with post-test1	0.781	<0.001*	0.810	<0.001*	0.631	<0.005*	0.810	<0.001*
b) pretest with post-test2	0.698	<0.001*	0.342	>0.05	0.438	>0.05	-0.086	>0.05
6- Lumbosacral angle pretest with post-test	0.98	<0.001*	0.969	<0.001*	0.94	<0.001*	0.920	<0.001

r = correlation coefficient. P = probability. * = significant.

Double Effect of MFR and SST on Pain Reduction

In group I (control) after six settings, pain reduction was reported by 3.59%, yet the change was clinically insignificant. The percentage of pain reduction in groups II, III and IV were 33.3, 12.2 and 39.86 respectively. This means that both techniques (MFR and SST) had the greatest effect on reduction of pain perception than the effect of any technique alone on people with mechanical low back pain. The effect of immobilization of the joint and muscles and the adverse effect of both mechanical treatment intervension may give the best scientific analysis of this results.

The effect of immobilization of the facet joints may lead to increase of bradykinin and prostaglandin clinical substances which are irritating substances to the mechanoreceptors of the facet joint capsules and subsquently increase pain and muscle spasm [13]. The mechanical effect of muscle spasm may be increased with subsquent shortening of fascia, which may increase the mechanical defect of the lumber spine[16]. MFR and SST can break down this mechanical default and pain cycle with subsquent decrease of pain perception in groups II, III, and IV. The mild reduction of pain perception in the control group may be due to increasing circulation followed application of heat by electric pad[6].

Double Effect of MFR and SST on Increasing AROM

The results of this current study showed increase in AROM (FF, RLB, LLB) in comparison with the pre-test values.

In FF, there was significant variations between pre-test scores and those in post-test 1 and 2 in the four groups F=13.87, P<0.001 for the difference 1 value and F=31.2, P<0.001 for the second. Thus six sessions of MFR increased the FF by 8.25%, 66.3%, 25.6% and 56.2% in groups I, II, III and IV respectively. The percentage increased in FF values on postes 2 in the four groups were 12.2, 121.7, 65.3 and 106.6 at P<0.001 for each.

In RLB, after 6 settings, there was increase in RLB by 10.5%, 35.5%, 17.2%, and 51..2% in groups I, II,III and IV respectively.

In LLB, there was increase in LLB toward normal value in group IV more than in group II, III, and I. Mechanical default in lumber spine may lead to muscle spasm and or fascial restriction with affection of the ROM [14,3,18]. Manheim and Lavett[12] suggested that spasm in erector spinae muscles put the lumber area into hyperlordosis. It is proposed that increased tone of interspinales muscle tends to hyperextend the segments affected but multifidus increased tone tends to rotate the lumber spine by pulling the involved spinous process anterior and lateral [8]. It is documented that the effect of iliopsoas spasm lead to forward bending of the trunk[18] and gluteus maximus spasm tends to pull the pelvis posteriorly and laterally. The Thoracolumber fascia covers the back muscles and continuous with the investing fascia of the pelvis. Restriction of the fascia will reflect itself in decreasing the ROM of lumber spine including forward flexion [11]. The explanation of these changes is due to the fact that both techniques, MFR and SST have a double effect that breaks down the spasm cycle. This may be through reduction of formation of the chemically irritating substances, bradykinin and prostaglandin. This may increase the active ROM in the facet joints.

Double Effect of MFR and SST on Normalization of Posture

The results of this current study showed changes in LSA significantly, after completion of 12 settings, in group IV more than III, II and I respectively. Pelvic tilt showed significant changes after completion of 12 settings, in group IV more than in group II, III and I respectively. The relationship between LSA changes towards normal had no relations with improvement of AROM of lumbosacral area or pain perception. MFR had the greater effect than SST on improving motion and reducing pain in such patients. Pelvic tilting as regard to the pre-test values in the four groups, no significant difference. Six settings decreased the pelvic tilt by 6.9%, 62.7%, 57.7% and 56.4% in groups I, II, III and IV respectively.

It is noticed in this study that several cases were normalized or improved with a little changes on LSA. This was confirmed with the work of Mills et al (1986).

Control Group and Placebo Effect

The minimal changes had been noticed in dependent variables in post-test$_1$ and post-test 2 may be due to temporary increasing of local circulation following application of electric pad which may decrease muscle spasm and increase AROM or changes LSA [4,3,5]. Only as a placebo without stretching techniques of soft tissue caused mild improvement in pain after six sessions in seven patients, while 11 not improved and two get worse.

Recommendation

It is recommended that MFR and SST should be used together to release fascial restriction and muscle spasm in mechanical disorders and inflammation of musculo-skeletal system and/or after long immobilization or recumbancy.

Conclusion

The anatomical inter-relationship between fascia and muscles in lumbar and pelvic areas create a conflict estimation to detect the cause of MBP, if it is caused by fascial restriction or muscle spasm. The aim of this study was to investigate the effect of MFR and SST on the lumber and pelvic posture in chronic mechanical LBP. Eighty participants were conducted in this study (42 male and 38 female).Their age ranged between 20-40 year-old. They were equally grouped into four groups. They received soft tissue mobilization techniques in form of myofascial release, spray-stretch technique and a combination of both in the three investigated groups respectively. The patients in the control group received electric heating bad. The result of this current study indicated the following:

1. Both techniques of therapy (MFR and SST) used in this study are very valuable in management of MBP.
2. A combination of both techniques of therapy (MFR and SST) had the greatest significance in improving AROM and pain reduction in patients with MBP.
3. The relationship between LSA changes towards normal had no relations with improvement of AROM of Lumbosacral area or pain perception. MFR had the greater effect than SST on improving motion and reducing pain in such patients.

REFERENCES

1. Adams, M.A., and Hutton, W.C.: The effect of posture on the lumber spine. Bone joint Surg. 67B:4, 625, 1985.
2. Baker, B.A.: The muscle trigger: evidence of overload injury. J. Neurol. Orthop. Med. Surg. 7: 35-44, 1986.

3. Bardes, J. Myofascial Release: A comprehensive evaluatory and treatment approach, 2nd ed., National Liberary, Pennsyvania, 1990.
4. Barnes, J.F. and Smith G.: The body is a self-correcting mechanism. PT Forum, July, 1987.
5. Basmajian, J. and Nyberg, S.: Rational Manual Therapy. Textbook, 2nd ed., Williams and Wilkins, Baltimore, P. 412, 1993.
6. Dillard, J., Trafimow, J. and Anderson, G.: Motion of the lumber spine, reliability of surement techniques. Spine. 16:321, 1991.
7. Gitelman, R.: A chiropractic approach to biomechanical disorders of the lumer spine and pelvis. Modern developments in the principles and practice, 1980.
8. Giuliani G., Poppi, M. and Acciarri, N.: Ct scan and surgical treatment of traumatic iliacus heamatoma with femoral neuropathy: Case study, J. Trauma 30 : 229-231, 1990.
9. Han J., Ahy, J., Coel, V. and McGoman.: CT-based geometric data of human spine. J. spinal-disord. Dec. 5(4): 448-58., 1992.
10. Jull and Janda.: Muscles and motor control in low back pain: assessment and management. Churchill Livingstone, New York, pp. 253-278, 1987.
11. Leong J.C. Luck. K. and Ho, H.: The iliolumber lligament Its anatomy, development and clinical significance Int. Soc. for Lum! Spine, Sydney, Australia, 1985.
12. Manheim, C.J. and Lavett, D.K.: Myofascial Release, Manual, NJ, 1989.
13. Pope, M and Novotny. Spinal biomechanics. J. Biomech. Eng. 115 (48), 1993.
14. Schafer, R. C.: Clinical biomechanics, musculoskeletal actions and reactions. Textbook, Williams and Wilkins, Baltimore?London, P.451, 1985.
15. Tichauer, E.R.: The objective corroboration of back pain through thermography. J. Occup. Med., 9:727, 1977.
16. Towmey, L.T. and Tylor, J.R.: Physical Therapy of the Low Back. Textbook, New York, London P.51-81, Slack Inc., 1987.
17. Towmey, L.T. and Tylor, J.R.: Age Changes in the lumbar intervertebral discs. Acta Orthop. Scand., 56:496, 1985.
18. Travell and Simon: Myofascial pain dysfunction, the Trigger point manual, the lower extreemities. Wiliams and Wilkins, 1st. ed., Baltimore, 1980

الملخص العربى

تأثير تحريك الأنسجة الرخوة على وضع المنطقة القطنية والحوض في ألآم أسفل الظهر الميكانيكية المزمنة

إن العلاقة التشريحية بين العضلات والأنسجة الضامة فى المنطقة القطنية ومنطقة الحوض لها إرتباط بمسببات الآلم أسفل الظهر خاصة إذا كان السبب نتيجة إضطرابات فى العضلات والأنسجة الضامة . وكان الهدف من هذه الدراسة هو فحص تأثير طريقة إنفراج النسيج العضلى الضام وطريقة الرش والشد على المنطقة القطنية فى حالات ألآم أسفل المنطقة القطنية المزمنة . وقد اشترك فى هذه التجربة ثمانين مريضا (٤٢ رجل ، ٣٨ سيدة) تتراوح أعمارهم بين ٢٠ – ٤٠ سنة . وقد قسمت العينة إلى أربعة مجموعات . وقد تلقوا جلسات معالجة الأنسجة الرخوة فى شكل انفراج النسيج الضام ، وطريقة الرش والشد وكلاهما فى ثلاث مجموعات . أما المرضى فى المجموعة الضابطة فقد تلقوا علاج حرارى بالمخدة الكهربية .

ونتائج هذه الدراسة بينت ما يلى :

كلا الطريقتين : انفراج النسيج الضام والرش والشد أثبتا فاعلية فى علاج ألآم أسفل الظهر الميكانيكية .

الطريقتين العلاجيتين معا لهما التأثير الأكبر على زيادة مدى الحركة وتقليل الألم .

ليس هناك علاقة بين تغيرات زاوية الحوض وزيادة مدى الحركة أو الآلام المحسوبة . انفراج النسيج الضام له تأثير أكبر من طريقة الرش والشد على زيادة الحركة وتقليل الألم فى نفس المرضى .