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The effect of Lumbar traction in low back pain patients with Sciatica.

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Clinical approaches for Low Back Pain (LBP) with sciatica include Lumbar traction (LT), although there is no convincing evidence that LT is clinically effective, no sufficient evidence of inefficacy to discard this method was suggested, particularly in discopathies patients with sciatica. The present study focused to investigate the impact of Lumbar traction in LBP patients with sciatica. Strategies: Sixty patients aged 40-65 years suffering from LBP with sciatica, participated in this study. Patients were randomly assigned into experimental group (G1), receiving traditional physical therapy with LT, or control group (G2), receiving only traditional physical therapy. Traditional physical therapy consisted of local heat, ultrasound for the lumbar region, and exercise program, given for 3 sessions a week for four weeks. The results were collected using the pain visual analogue scale (VAS), Oswestry disability index (ODI), and soleus H-reflex and were documented at three occasions at baseline, at the end of the treatment, and 3 months following the end of treatment. Regarding to the normality of the data, a 2 x 3 split-plot ANOVA test utilized for statistical analysis. The significance level was set at a 95% confidence interval. All measured parameters were improved when patients used LT and/or traditional physiotherapy (p <0. 05). In line with the obtained data the pain VAS, ODI, and soleus H-reflex scores improved for both groups. This study confirmed that both treatment methods are effective, Lumbar traction is one of the most effective clinical techniques used.

Keywords: Low Back Pain, Lumbar Traction, H-reflex

INTRODUCTION

Low back pain (LBP) is one of the most common forms of chronic pain and is a significant cause of disability and cost in society. LBP substantially influences the capacity to work and has been associated with the inability to obtain or maintain employment and lost productivity (Revel, 2000 and Robert, 2010). LBP with sciatica is the common referral for remedy (Vroomen et al., 2002). Almost 40% of LBP patients experience sciatica with or without neurological signs (Fisher, 2002). Sciatica is identified as pain in the lower lumbar as well as hip radiating down the back of the thigh into the calf, and is often caused by lumbar disc prolapse (LDP) that compromises the L5 or S1 nerve root. Sciatica is often associated with tingling or pins and needles in the dermatomal distribution of the damaged nerve root (Moore et al., 2006). There is a little evidence about the best approach for LBP management. Despite the growing knowledge of this condition, there is no consensus about the most effective treatment. Many physical therapy modalities in treating LBP are questionable about its efficacy, and the perfect treatment remains hidden (Van Tulder et al., 1997 and Rastanen, 2001). Rehabilitation approaches for LBP with sciatica include lumbar traction (LT), which is employed by clinicians to treat LBP patients with or without radicular symptoms (Li and Bombardier, 2001 and Harte et al., 2005). There are many types of traction which are being used for treatment for LBP with LDP; manual traction (Thomas et al., 2000), auto traction (Reust et al., 1988), motorized traction (Borman et al., 2003), and gravitational traction (Harte et al., 2003).

As the best we know, there is a conflict about using LT for LBP rehabilitation. Krause (Krause et al., 2000) mentioned that LT may cause vertebral separation, e.g. decrease of disc protrusion or alter intradiscal pressure; which could relief radicular symptoms by removing pressure or contact forces from sensitized neural tissues. On the other hand Clarke and his colleagues (Clarke et al., 2006), weren't able to find strong evidence to support the application of LT in LBP patients. The aim of this study was to examine the efficacy of LT in LBP patients with sciatica.

MATERIALS AND METHODS

Participants

This Randomized controlled trial study examined 60 LBP patients, aged 40-65 years, who were diagnosed as having unilateral S1 radiculopathy more than 3 month duration (Krause et al. 2000). Patients with history of previous spinal surgery, central canal stenosis, rheumatoid arthritis, spinal tumor, recent vertebral fracture, or long-term oral steroid intake were excluded. The involved side will be determined by the presence of constant back pain with sciatic distribution (buttock, back of thigh, leg, and ankle), burning, stabbing, paraesthesia, weak planter flexion, decreased Achilles tendon reflex, positive straight leg raise test and confirmed with magnetic resonance imaging (MRI). Patients were recruited from the outpatient clinic of the physical therapy and rehabilitation department of in King Khalid Hospital in Tabuk city, Saudi Arabia. All patients signed an informed consent form, approved by the Research Ethics Committee, University of Tabuk, Tabuk, Saudi Arabia. To calculate the sample size, considering a confidence level of 95% and power of 80%, we used a similar study to calculate sample size (Van Tulder et al. 1997 and Harte et al., 2003). Table (1) shows characteristics of the participants.

Intervention

After each subject reads and signs an informed consent, demographic data was obtained including age, weight, height, and duration of LBP. Patients were divided into two groups randomly; experimental group (G1) who toke a traditional physical therapy program and LT and control group (G2) who toke a traditional physical therapy program and no LT. The outcome measures were collected using the pain VAS, ODI, and soleus H-reflex, and were recorded at three occasions at baseline, at the end of the treatment, and 3 months following the end of treatment.

Equipment

The VAS is most important simple scale used in pain research. VAS represents the intensity dimension by a 10 cm plain line with two anchor points of "no pain" and "worst pain I ever felt". The patient was requested to draw a line at the point that best match his or her pain level. The VAS is the most trusted scale in the assessment of pain in the clinical setting and has been reported to be sensitive and reliable (Larroy, 2002; Gillian et al., 2011 and Kumar, 2013). The functional disability of every patient was assessed by the ODI. The ODI contains 10 multiple-choice questions of LBP included disability in daily function and leisure time activities, for every question the patient choose one sentence out of six that best match his or her disability. For each portion of the six statements the total ratings are 5, if the first statement is selected, the score is zero, if the last is selected the score is 5. The final rating is calculated as follow: Total score= (5 x numbers of questions answered) x 100%. The maximal rating is 50 (maximum disability) and the result take as a portion from the total score. High rating score indicate greater disability. Rating from 0 to 20% indicate minimal disability, rating from 20 to 40 % indicate moderate disability, score 40 to 60 % indicate severe disability, rating from 60 to 80 % indicate crippled disability, and score from 80 to 100% indicate that the patient confined to bed. This questionnaire is valid and reliable for a condition-specific outcome of vertebral disorders (Restanen, 2001 and Gillian et al., 2011). The ODI is better predictor of return to work than other lumbar spine assessments (Jeremy et al., 2000 and Kumar, 2013); its measurements have high test-retest reliability (Fairbank and Pynsent, 2000). A Cadwell Sierra II electromyography device, including Sierra II 2 channel amplifier, (Cadwell Labs, Inc., Kennewick, WA) was used to electrically induce and record the soleus H-reflex. Two silver-silver chloride surface bar electrodes were used as inducing and recoding electrodes and rounded silver electrode 2 centimetres in diameter was used as a ground electrode (Sabbahi and Khalil, 1990a).

The traction unit to be used for treatment: A TX traction device (Chattanooga Medical Supply, Incorporation. Chattanooga, TN) with a split-function table (TTET200) from the same manufacturers was used to apply LT. All assessments and treatment were performed in the department of physical therapy at King Khalid Hospital in Tabuk city, Saudi Arabia.

Measurements

Evaluation environment was constant through the research study. The evaluation procedures were done by the same physiotherapist. Starting with a brief explanation about the testing protocol for each patient, the evaluation procedures done in the beginning before starting treatment, repeated by the end of treatment which extended for one month, and after finishing treatment by three months.

H-reflex assessment: the electrodes for the electromyography were located in line with the description reported by Sabbahi & Khalil (Sabbahi and Khalil, 1990a). Soleus H-reflex was elicited five to eight times. The soleus H-reflex was recognized by occurrence of involuntary foot planter flexion during pulse release. The participants instructed to maintain the same head, arms and legs position as much as possible during testing allowing for reliable H-reflex measures (Hopkins et al., 2000 and Nalty and Sabbahi, 2001). The most maximum five H-reflex amplitudes were averaged (Palmieri et al., 2004). Pain examination was done using VAS (Suri et al., 2011). The functional disability of each patient was assessed by ODI (Fairbank and Pynsent, 2000 and Beyki et al., 2007).

Treatment procedures:

After initial evaluation, all the participants were involved in the traditional physical therapy program for LBP, 3 times a week for four weeks. Only patients in experimental group (G1) receive LT. The application of LT (Krause et al 2000 and Annette et al., 2005), the patient was positioned in supine position with his hips and knees at 90 degrees of flexion. Patient head was away from traction unit while the lower part of the body rests on the mobile section of the bed that can slide away from the upper body when the traction force is applied. The traction belt was fastened around the pelvis. Sustained traction was applied equal to 50 % of patient's body weight (Osturk et al., 2006), for 20 minutes (Borman et al., 2003). There were no risks, or side effects from the application of LT. A Safety switch button was handed to the patient if he/ she feel any discomfort or unusual pain, by pressing this switch button the device will stop traction and relieve the force gradually.

DATA PROCESSING AND ANALYSIS:

In all treatment sessions, the physiotherapist was uninformed of the patients' position in which group. The patients were re-evaluated at the start, immediately after treatment and at 3-month follow-up. The main outcome measures of the treatments were: the pain VAS, ODI, and soleus H-reflex. Data were analyzed by main researcher.

STATISTICAL ANALYSIS:

The IBM SPSS statistics 23 software was utilized for statistical analysis. The analysis of data for this randomized controlled trial was done using descriptive statistics and a 2 x 3 split-plot ANOVA with two groups (experimental vs. control) as the between subjects factor and the three time intervals (pre-treatment, post-treatment, and follow-up) as the within subjects factor. The dependent variables were VAS score, ODI score in percentage, and H-reflex amplitude value in millivolt. The alpha level was set at 0.05 and adjusted, when necessary, for further comparisons. Prior to data analysis Shapiro–Wilk test and Levene's test were utilized to test the normality of the data and the equality of variances, respectively. The differences in characteristics of both groups were assessed using unpaired t-tests with alpha at 0.5.

RESULTS

As shown in Table 1, there was no statistical significant difference between both groups in demographic data. Shapiro–Wilk test and Levene's test revealed no violations of the assumptions of normality and homogeneity of variance for any of the dependent variables. The means and standard deviations of VAS score, ODI score, and H-reflex amplitude for each group at each time interval are illustrated in Figure 1, Figure 2, and Figure 3, respectively. All pre-treatment dependent variables showed no significant difference between the two groups ($p > 0.05$).

Table 1; Characteristics of the participants.

Characteristics		Experimental group	Control group	p-value
Age (years)		53.5 ± 6.16	53.23 ± 5.45	0.858
Weight (kg)		66.7± 12.17	67.5± 10.46	0.785
Height (cm)		159 ± 8.08	159.6 ± 7.18	0.99
Duration of LBP (months)		4.3 ± 1.05	4.4 ± 1.03	0.712
Gender	Male	15 (50%)	15 (50%)	0.99
	Female	15 (50%)	15 (50%)	

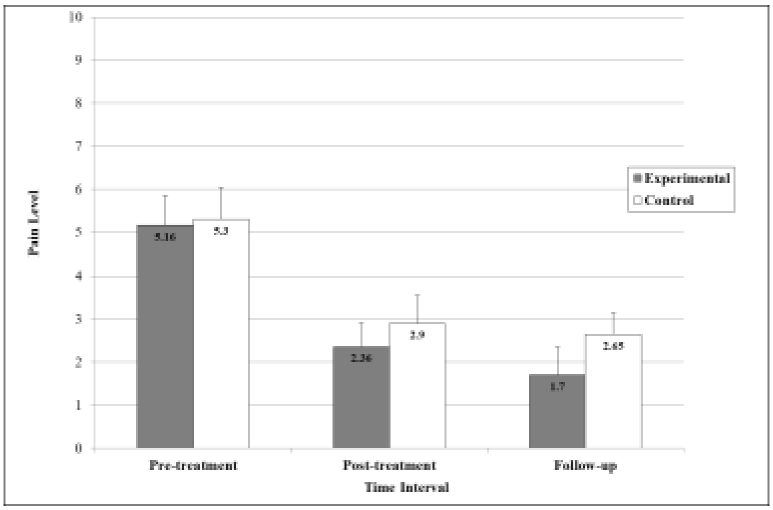

Figure 1; The means and standard deviations of pain level for the experimental and control groups at pre-treatment, post-treatment, and follow-up.

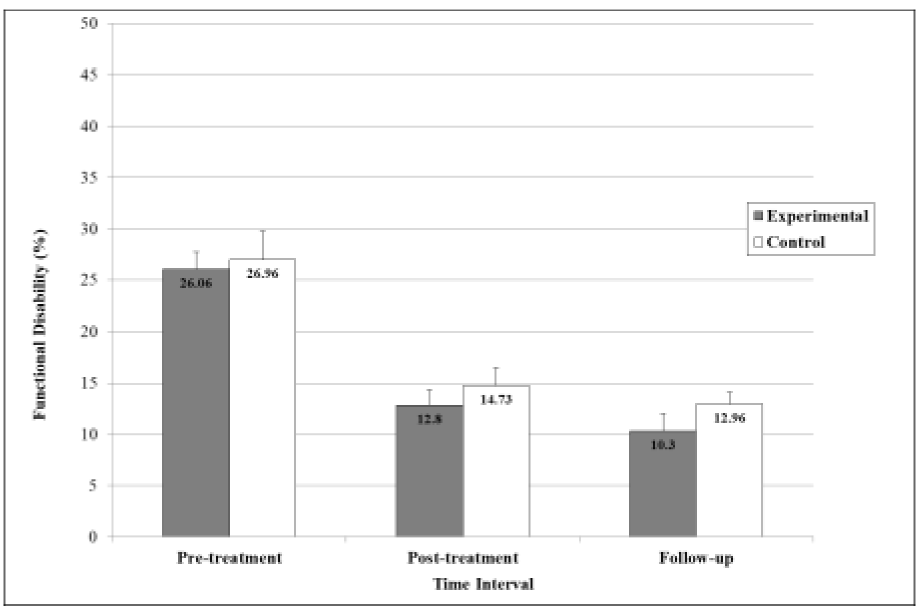

Figure 2; The means and standard deviations of functional disability level for the experimental and control groups at pre-treatment, post-treatment, and follow-up.

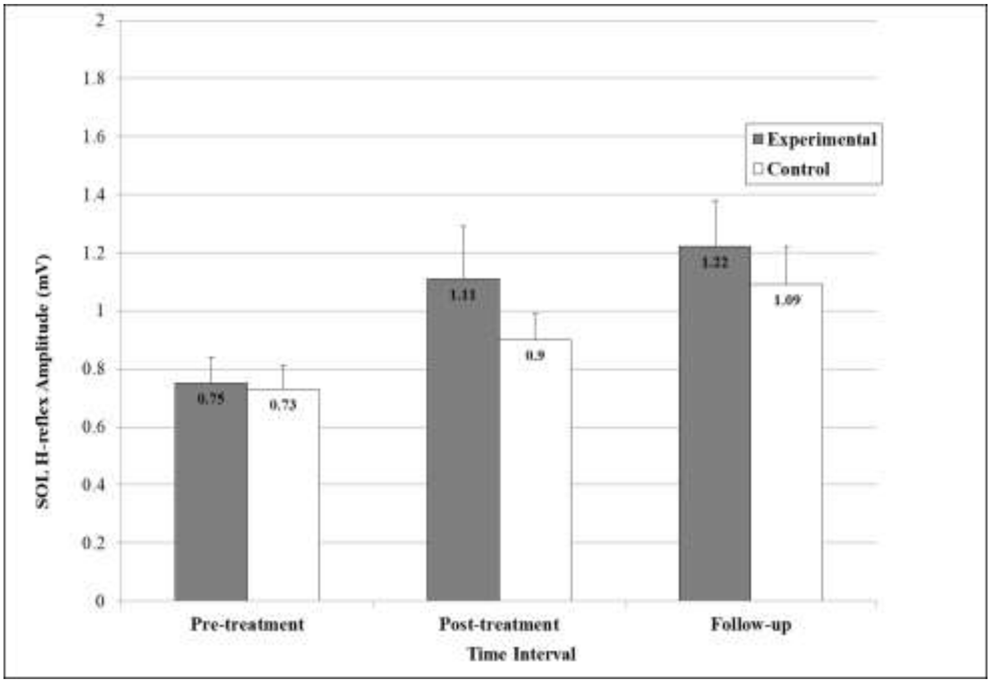

Figure 3; The means and standard deviations of SOL H-reflex amplitude for the experimental and control groups at pre-treatment, post-treatment, and follow-up.

Table 2; Results of the 2 x 3 ANOVA.

Outcome	Factor	df	F	p-value
Pain level	Treatment	1, 58	14.53	<0.0005*
	Time	2, 57	508.17	<0.0005*
	Treatment x time	2, 57	6.93	0.002*
Functional disability	Treatment	1, 58	29.08	<0.0005*
	Time	2, 57	1065.21	<0.0005*
	Treatment x time	2, 57	3.798	0.028*
Soleus H -reflex	Treatment	1, 58	18.73	<0.0005*
	Time	2, 57	204.72	<0.0005*
	Treatment x time	2, 57	16.06	<0.0005*

(*) Significant effect at α = 0.05.

Table 3; Results of the repeated measures ANOVAs for the main effect of each time interval within each group.

(*)

Outcome	Group	ε̂	df	F	p-value
Pain level	**Experimental**	0.755	1.51, 43.79	453.67	<0.0005*
	Control	0.826	1.65, 47.91	324.84	<0.0005*
Functional disability	**Experimental**	0.872	1.74, 50.59	1335.19	<0.0005*
	Control	0.764	1.52, 44.33	517.16	<0.0005*
Soleus H-reflex	**Experimental**	0.628	1.25, 36.42	188.93	<0.0005*
	Control	0.660	1.32, 38.29	116.57	<0.0005*

Significant difference at α = 0.025

Results of the 2 x 3 ANOVA.

Table 2 shows the results of the 2 x 3 ANOVA that demonstrated significant main effect of treatment, significant main effect of time, and significant interaction effect of the two factors on the three outcomes.

Tests of simple effect

Simple effect of time

Since significant interaction effects of treatment and time on the pain level, ODI score, and H-reflex amplitude were found, tests of simple effect were conducted to examine the main effect of each time interval within each group by conducting two separate repeated measures ANOVAs for repeated measures. Alpha level was adjusted to 0.05/2 (number of repeated measures ANOVA) = 0.025 to avoid type I error. Furthermore, the degrees of freedom (factor and error) were adjusted according to the obtained Geisser-Greenhouse epsilon hat ($\hat{\varepsilon}$) to account for the violation of sphericity assumption. The results revealed significant differences among the three time intervals in both experimental and control groups in the three outcomes (Table 3).

Follow-up Tests. In that case, the repeated measures ANOVAs were followed by all pairwise comparisons using Bonferroni tests. Alpha level was further adjusted to 0.025/3 (number of comparisons in each group) = 0.008 to prevent alpha inflation. The results of the all pairwise comparisons revealed significant improvement in pain level, functional disability, and SOL H-reflex with time in both groups. Specifically, there were improvements at post-treatment and follow-up versus pre-treatment, and at follow-up versus post-treatment (Tables 4, 5, and 6).

Simple effect of treatment

Tests of simple effect were also conducted to examine the main effect of each treatment program within each time interval. Alpha level was adjusted to 0.05/3 (number of comparisons) = 0.0167 to prevent type I error. The results revealed significant improvement in the experimental group in comparison to control group in term of pain level, ODI score, and H-reflex amplitude at post-treatment and follow-up. The t statistics, degree of freedoms and p values for the simple effect of treatment at each time interval are shown in Table 7.

Table 4; Results of all pairwise comparisons for pain level at pre-treatment, post-treatment, and follow-up for the experimental and control groups.

Pairwise Comparison	t	df	p-value
Experimental Group			
Pre-treatment vs. post-treatment	23.14	29	<0.0005*
Pre-treatment vs. follow-up	23.11	29	<0.0005*
Post-treatment vs. follow-up	7.58	29	<0.0005*
Control Group			
Pre-treatment vs. post-treatment	19.51	29	<0.0005*
Pre-treatment vs. follow-up	20.24	29	<0.0005*
Post-treatment vs. follow-up	3.78	29	<0.0005*

(*) Significant difference at α = 0.008.

Table 5; Results of all pairwise comparisons for functional disability level at pre-treatment, post-treatment, and follow-up for the experimental and control groups.

Pairwise Comparison	t	df	p-value
Experimental Group			
Pre-treatment vs. post-treatment	44.97	29	<0.0005*
Pre-treatment vs. follow-up	40.85	29	<0.0005*
Post-treatment vs. follow-up	8.47	29	<0.0005*
Control Group			
Pre-treatment vs. post-treatment	22.49	29	<0.0005*
Pre-treatment vs. follow-up	26.57	29	<0.0005*
Post-treatment vs. follow-up	5.57	29	<0.0005*

(*) Significant difference at α = 0.008.

Table 6; Results of all pairwise comparisons for SOL H-reflex amplitude at pre-treatment, post-treatment, and follow-up for the experimental and control groups.

Pairwise Comparison	t	df	p-value
Experimental Group			
Pre-treatment vs. post-treatment	11.90	29	<0.0005*
Pre-treatment vs. follow-up	16.24	29	<0.0005*
Post-treatment vs. follow-up	9.50	29	<0.0005*
Control Group			
Pre-treatment vs. post-treatment	13.77	29	<0.0005*
Pre-treatment vs. follow-up	12.52	29	<0.0005*
Post-treatment vs. follow-up	7.08	29	<0.0005*

(*) Significant difference at α = 0.008.

Table 7; Results of all pairwise comparisons for pain level, functional disability level, and SOL H-reflex amplitude at pre-treatment, post-treatment, and follow-up for the experimental versus control group.

Outcome	Interval	Group		Test of significance		
		Experimental (M±SD)	Control (M±SD)	t	df	p-value
Pain level	**Pre**	5.16 ± 0.69	5.3 ± 0.74	0.508	59	0.479
	Post	2.36 ± 0.55	2.9 ± 0.66	11.42	59	0.001*
	Follow-up	1.70 ± 0.65	2.65 ± 0.50	11.26	59	<0.0005*
Functional disability	**Pre**	26.06 ± 1.65	26.96 ± 2.80	2.28	59	0.136
	Post	12.80 ± 1.56	14.73 ± 1.77	19.99	59	<0.0005*
	Follow-up	10.30 ± 1.68	12.96 ± 1.12	51.87	59	<0.0005*
Soleus H -reflex	**Pre**	0.75 ± 0.09	0.73 ± 0.08	1.08	59	0.301
	Post	1.11 ± 0.18	0.90 ± 0.09	29.45	59	<0.0005*
	Follow-up	1.22 ± 0.16	1.09 ± 0.13	10.95	59	0.002*

(*) Significant difference at α = 0.0167.

DISCUSSION

The present study aimed to evaluate the effect of Lumbar Traction in LBP Patients with Sciatica. This study was performed using the pain VAS, ODI, and soleus H-reflex to determine the improvements in LBP; those methods are non-invasive and more reliable than other tests. The VAS for the assessment of back and leg pain intensity is much better to use than other scales: the numerical pain rating scale and the verbal scales for example the McGill pain questionnaire (Larroy, 2002; Gillian et al., 2011 and Kumar, 2013). The ODI, which is one of the most useful scales of functional outcome for patients with low back problems, this index is valid and reliable for a condition-specific outcome of spinal disorders (Fairbank and Pynsent, 2000 and Restanen, 2001). The ODI is much better predictor of return to work than other methods of lumbar spine examination (Jeremy et al., 2000 and Kumar, 2013). ODI measurements have high test-retest reliability (Fairbank and Pynsent, 2000).

The H-reflex is a useful method to examine the proximal nerve segments and the central nervous system which is unreachable by commonly used surface stimulating and recording techniques (Ali and Sabbahi, 2000). H-reflex avoids muscle spindle bias; this can be a valuable method to determine the integrity of conductivity through the reflex pathway and motoneuron pool excitability (Palmieri et al., 2004). Changes in soleus H-reflex parameters in particular, have been observed in LBP patients with radiculopathy (Sabbahi and Khalil, 1990b). H-reflex abnormalities have been found to have a high predictive value in S1 radiculopathies (Fisher, 2002).

This study was performed on sixty subjects suffering from LBP with Sciatica without previous history of spinal surgery or any other abnormality other than for Lumbar disc prolapse. Due to the variety of methods used to measure disability of LBP with Sciatica, it is difficult to compare our results with the ones from other studies. The difference involving the results of our and previous studies indicating the efficacy and inefficacy of traction therapy may be explained by the dissimilarities in the diagnostic categories of LBP, available traction techniques, and methodology

(Pellechia, 1994; Beurskens et al 1995 and Koes et al 1995).

Our results confirmed that both groups gained improvement in back and leg pain intensity, functional disability index and in H-reflex. The improvement of our patients in both groups may be explained by the traditional physical therapy program which comprising local superficial heat and thermal ultrasound effects, and exercises program. The suggested mechanism of alleviating pain is that temperature changes of some degrees at different depths alter nerve conduction, increase collagen extensibility, lessen pain, and accelerate recovery (Basford, 1998). For that reason, thermal therapies are considered complementary to exercise sessions and help to boost the efficiency of other modalities. As well the improvement of our patients may be caused by the effect of exercise therapy. Exercise is one of the most crucial rehabilitation modalities (Hansen et al. 1993; Mannion et al. 2001 and Rastanen, 2001). The majority of the prior studies suggested short-term efficacy of these modalities (Cherkin et al 1995 and Li and Bombardier, 2001).

Also, it was evident from our results that adding LT plus physiotherapy, in comparison to physiotherapy only, can contribute significantly for more decompression to neural tissues and more immediate improvement. Radiating leg pain occurs due to compression of nerve roots by the prolapsed disc material as well as by the inflammatory and chemical irritability of these roots. As a result of these factors, the intravascular hydrostatic pressure is increased causing perineural edema (Takahashi et al., 2003). Therefore once traction is applied, the negative intradiscl pressure is formed which may promote the healing; as nutrition, oxygen, and water are transfused to the disk and assisting to remove the chemical irritants (Naguszewski et al., 2001).

Applying LT in rehabilitation of patients with lumbar disc herniation can produce reduction of leg pain severity (Guvenol et al., 2000). Sari (Sari et al., 2005) studied the effect of LT with traction force 45kg in patients with lumbar disk herniation. He mentioned that there is a reduction of herniated disc area by 25%, an increase of the spinal canal area by 22%, and an extending of the neural foraminal by 27%. All of those cause decompression of the herniated disc material away from the spinal nerve roots, simultaneously relieving leg pain.

It had been found that discogenic LBP was reduced when patients were treated with LT, with traction force 50% of body weight. This reduction of back pain severity may be caused by the following mechanisms: The first mechanism, LT diminishes the compressive load on the intervertebral discs and apophyseal joints, which causes a flattening of lumbar lordosis, stretches lumbar spinal muscles, decreases muscle spasm, and relieves back pain (Guvenol et al. 2000; Sari et al. 2005 and Apfel et al. 2010). The second mechanism, LT stretches the posterior longitudinal ligament, which plays an important role in stimulating mechanoreceptors and reducing back pain. Once LT is applied there is stretching force transmitted to the posterior longitudinal ligament, which is strong and thick at the midsagittal line, this stretching force pushes back the prolapsed disc to its normal position and prevent abnormal posterior movement of the disc material (Cyriax and Cyriax, 1985; Lee and Evans, 2001 and Sari et al. 2005).

Functional improvements in LBP patients was studied by Cai (Cai et al., 2009) who found that there was improvement of the ODI in LBP patients treated with LT with traction force 30% to 40% of body weight. He explained these improvements by the effect of LT as it enhances blood flow to the damaged tissues, and therefore it enhances muscle power (Komori et al. 1998). According to Krause (Krause et al. 2000), the improvement of the strength of ankle joint muscles may results from restoration of normal conduction in the large diameter myelinated afferent and efferent nerve fibers. This restoration of normal conduction can be explained by the increase in the intervertebral foramen diameter which results in better blood flow within the spinal nerves and intraforaminal blood vessels, and this causes a reduction of any existing ischemia. Increased blood flow could, in turn, remove inflammatory exudates.

Traction plays an important role in pain spasm cycle. Once pain of the back is reduced, the spasm of the back muscles is reduced, and hence allowing vertebral separation and increasing of the intervertebral disk space and allow the patient to be free to move (Krause et al., 2000; Cevik et al., 2007 and Apfel et al., 2010). Traction can produce a preliminary increase of the sacrospinalis muscle activity. Following this increase, there is progressive decrease in its activity due to muscle exhaustion. Thus allowing intervertebral separation and improve the intervertebral disk space (Weatherell, 1987).

Improvements in soleus H-reflex parameters particularly the H-reflex amplitude was found to be more sensitive to changes of the magnitude of compressive force over the nerve roots, and has been recommended that soleus H-reflex amplitude is a more sensitive measure for S1 radiculopathies (Ali and Sabbahi, 2000). Sabbahi and Khalil (Sabbahi and Khalil, 1990b) noticed a significant decrease or absence of soleus H-reflex amplitude in patients diagnosed as having S1 radiculopathy. They mentioned that reduction was due to obstruction of conduction in some large nerve axons resulting in a decreased recruitment of the motoneuron in eliciting large reflex amplitude. Apfel and colleges (Apfel et al., 2010) used computed tomography (CT) scans for investigating the effect of LT for patients with LDP, they concluded that the intervertebral disc space of (L3-L4, L4-L5, and L5-S1) were increased significantly. The increase in vertical dimension might be caused by 2 different mechanisms: The first mechanism; while the patient is in supine with both hips and knees flexed or prone with small pillow under the lower abdomen and pelvis, the lordotic curve of the lumbar spine is decreased with flattening of lumbar curve. Thus, the traction force works more effectively on the posterior components of the spinal vertebral column while the anterior intervertebral disc height may be reduced (Lee and Evans, 2001; Sari et al. 2005; Cevik et al., 2007 and Beyki et al., 2007). The other mechanism is achieved by the traction position that stretches the posterior annulus which might prevent excessive posterior movement of the disc material and help to reduce the posterior disc prolapse as well as increase the posterior disk height and decrease the anterior disc height. Furthermore this traction position improves cross sectional area of the intervertebral foramina (Lee and Evans, 2001 and Sari et al., 2005). Wegner and his colleges (Wegner et al., 2013) explained that addition of traction to traditional physical therapy program could alleviate the mechanical compression on the nerve roots, and plays an important role in reducing the endoneural odema, and so it can help in normalization of the nerve conduction

CONCLUSION

This study indicated that adding LT to physiotherapy program can be beneficial.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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AUTHOR CONTRIBUTIONS

All authors contributed equally in all parts of this study. All authors read and approved the final version.

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