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CLINICAL AND FUNCTIONAL EFFECTS OF TRACTION FOR LUMBAR DISK HERNIA PATIENTS

LOMBER DİSK HERNİLİ HASTALARDA TRAKSİYONUN KLİNİK VE FONKSİYONEL ETKİLERİ

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ABSTRACT

Objective: In our study we performed continuous, intermittent and placebo traction treatment as physiotherapy modality for lumbar disk hernia and researched the effect on pain and functional status and superiority of the methods.

Methods: Our prospective, randomized, controlled study included 90 patients with lumbar disk hernia, randomly divided into three groups of 30 patients. Each group had heat pack and ultrasound applied before traction and, was taught isometric exercises. One of the groups underwent placebo traction, the second group had intermittent traction and the third group underwent continuous traction. Treatment was performed in fifteen sessions over three weeks. Patients were evaluated before treatment, after treatment and in the 3rd month after treatment. The visual analog scale (VAS), Oswestry low back pain disability questionnaire, LANSS pain scale (LANSS), modified lumbar Schober, finger-floor distance (FFD), paravertebral muscle spasm and lateral flexion were evaluated. Patients were compared within and between groups.

Results: When all groups are compared before treatment with after treatment and 3 month check-up, the LANSS score did not have significant improvement. The VAS, Oswestry, lumbar Schober, FFD and paravertebral muscle spasm scores significantly improved but there were no statistically significant differences between the groups.

Conclusion: In our study, no statistically significant superiority was shown for intermittent traction using 25-50% of body weight over continuous application using 25% of body weight. Additionally, both types of traction did not have statistically significant superiority to placebo traction application using 10-20% of body weight.

Keywords: Lumbar disk hernia, physical therapy modality, traction

ÖZ

Amaç: Çalışmamızda lomber disk hernisi tanısı alan hastalarda fizik tedavi modalitelerinden biri olan traksiyon tedavisinin, sürekli, intermittant ve plasebo olarak uygulandığında, ağrı ve fonksiyonel duruma etkisini ve kendi aralarındaki üstünlüklerini araştırdık.

Yöntem: Prospektif, randomize kontrollü yapılan çalışmamıza, klinik değerlendirme ve çekilen lomber MRG sonucunda lomber disk hernisi tanısı konan 90 hasta alındı, 30 kişilik rastgele üç gruba ayrıldı. Her gruba traksiyon öncesi lumbosakral hotpack ve paravertebral ultrason uygulandı, bel karın izometrik güçlendirme egzersizleri öğretildi. Gruplardan birincisine plasebo traksiyon, ikincisine intermittant traksiyon, üçüncüsüne sürekli traksiyon uygulandı. Tedavi üç hafta boyunca onbeş seans olarak yapıldı. Hastalar tedaviden önce, tedaviden sonra ve üçüncü ayda değerlendirildi. Görsel Analog Ölçeği (GAÖ), Oswestry bel ağrısı değerlendirmesi, LANNS skalası, modifiye lomber Schober, el-parmak zemin mesafesi (EPZ), lumbosakral paravertebral kas spazmı ve lateral lomber fleksiyon değerlendirildi. Hastaların grup içi ve gruplar arası karşılaştırmaları yapıldı.

Bulgular: Tedavi öncesi ile karşılaştırıldığında tedavi sonrası ve 3. ay kontrollerinde tüm gruplarda LANNS nöropatik ağrı skorunda anlamlı düzelme olmadı. Görsel Analog Ölçeği, Oswestry bel ağrısı değerlendirmesi, modifiye lomber Schober, EPZ ve lumbosakral paravertebral kas spazmı skorları anlamlı düzelirken, gruplar arasında istatiksel olarak anlamlı fark yoktu.

Sonuç: Çalışmamızda lomber disk hernisinde vücut ağırlığının %25-50'sinin kullanıldığı intermittant traksiyon uygulamasının vücut ağırlığının %25'nin kullanıldığı sürekli uygulamasından istatistiksel olarak anlamlı üstünlüğü gösterilemedi. Ayrıca her iki traksiyon tipinin de vücut ağırlığının %10-20'sinin kullanıldığı plasebo traksiyon uygulamasından istatistiksel olarak anlamlı üstünlüğü saptanmadı.

Anahtar Kelimeler: Lomber disk hernisi, fizik tedavi modalitesi, traksiyon

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Introduction

The lumbal vertebral column, which accounts for 25% of the entire spine length, consists of five active vertebrae.[1] Lumbar disk hernia is a clinical tableau characterized by low back and leg pain occurring due to compression of the lumbar spinal nerve root by a disk. Though not as common as supposed, it is a cause of acute, chronic or recurrent low back pain.[2] Nearly 60-80% of adults experience low back pain in at least one period of their lives. However, generally, the prevalence of lumbar disk hernia in society is reported as 1-3%. Lumbar radiculopathy occurs more often in the fourth and fifth decades of life. In males the prevalence of lumbar disk hernia is 2%, while it is 1.5% in females.[3,4] The most significant risk factors are physical activity, intense sport, lifting weights, frequent rotation of the trunk, exposure to vibration, age, tall height, obesity, smoking, psychological and genetic factors.[3,5] Lumbar disc hernias are a pathological process, often caused by degeneration of the lower lumbar vertebrae, which carry the load of the body. The anulus of the nucleus pulposus ruptures, causing hernia.[6] According to general opinion, the basic event in the pathogenesis of disk herniation is degeneration of the disk.

With the occurrence of lysosomal enzymes, the balance between proteoglycan synthesis and depolymerization is disrupted. Fluid intake increases as a result of proteoglycan degradation. Thus, increasing intradiscal pressure weakens the annulus and causes formation of herniation.[7] Diagnosis is generally made with clinical history and physical examination, but radiological assessment is important. In the acute period of the disease, the basis of treatment is controlled physical activity. In acute painful situations, it may be necessary to rest in bed in an appropriate position for a few days. Another important part of treatment is medical treatment. Medical treatment applies physiotherapy modalities to patients with uncontrolled pain and begins a rapid exercise program. Patients with mechanical low back pain, especially disk herniation patients, need to be included in “low back school” programs to protect their lower back against injury, take responsibility for their lower back and prevent recurrence, after the acute period has passed. Patients with cauda equina syndrome or progressive neurological deficits require emergency surgical interventions.[8,9] Physiotherapy methods, various physiotherapy modalities commonly used in the treatment of disc hernia help with early mobilization by healing symptoms such as pain and spasm. Physiotherapy modalities used for this purpose include superficial heat (hot and cold), traction, biofeedback, electrotherapy, acupuncture, exercise and corsets.[10]

Traction is a pulling technique applied to a part of the body to stretch soft tissue, widen joint intervals or separate fractured bone fragments from each other. Treatment of painful spinal column diseases with traction is a method used since the first ages, though it has begun to be used more commonly in the last 50 years.[11,12] Traction may be beneficial to resolve causes of mechanical pain like root nerve compression and irritation due to herniated disk mass or osteophytes, degeneration of cartilage in facet joints and synovitis development, facet subluxation, locking, compression of synovial membrane, stress on anterior or posterior longitudinal ligament and capsule, and muscle spasm.[12,13] In our study, the physiotherapy modality of traction was applied continuously and intermittently to patients with lumbar disk hernia diagnosis and we researched in terms of pain, clinical and functional status, and the superiority of each treatment method compared to placebo traction.

Methods

Our study received permission from Izmir Atatürk Education and Research Hospital Chief of Staff Local Ethics Committee (Decision No: 624, Date: 04/06/2009). The study included 90 patients attending Physiotherapy clinic in between April 2009 and December 2009 with complaint of low back-leg pain, with lumbar disk hernia diagnosis due to clinical assessment and MRI and was planned as a prospective, randomized, and controlled study. Those with aorta aneurysm, cauda equina compression, spondylolisthesis, severe osteoporosis, primary or metastatic spinal tumor, osteomyelitis, tuberculosis, inflammatory or infectious diskitis, spinal fracture, severe CVS disorder, sequestered disk or medulla compression, umbilical, hiatal or inguinal hernia, previous spinal surgery and pregnant cases were excluded from the study. Demographic features of the patients were similar. The treatment groups were created with 30 random individuals.

Mean age of cases in the first group was 38.26±11.34 years (17 males, 13 females), mean age of cases in the second group was 36.63±11.53 (13 males, 17 females), while mean age of cases in the third group was 41.33±14.07 years (19 males, 11 females). There was no statistically significant difference between the groups in terms of mean age, body mass index, mean duration of illness and gender. Each group had heat pack applied to the lumbosacral region for 15 minutes and then paravertebral ultrasound 1.5 w/cm for 10 minutes before traction. The first group (30 patients) had placebo traction (pulling force of 15-20% of body weight for 30 minutes), the second group (30 patients) had intermittent traction (pulling force beginning at 25% of body weight and increasing until limit of toleration with maximum weight of 50% body weight, applied for 30 minutes with 40 s pull and 10 s relaxation periods), and the third group (30 patients) had continuous traction (pulling force up to 25% of body weight for 1 hour) applied. In all three groups, the first day of treatment started with 10 minutes and the duration of treatment was gradually extended. Patients completing the treatment and follow-up periods were evaluated before treatment, after treatment and 3 months later. Pain severity was evaluated with the visual analog scale (VAS) and Oswestry low back pain disability questionnaire,

neuropathic pain was evaluated with the LANSS pain scale (LANNS), and physical status was evaluated with the finger-floor distance (FFD), paravertebral muscle spasm (PVMS), lumbar lateral flexion and modified lumbar Schober scale. Among the evaluation methods used in the study, VAS was measured in millimeters, FED, lateral flexion and Schober in centimeters, PVMS and LANNS as positive or negative. In addition, the VAS was evaluated in three situations: resting, nighttime and movement. Patients were compared within and between groups. The study was completed in accordance with the Helsinki Declaration. Patients were informed about the procedures and patient consent forms were obtained.

Statistical Analysis

For statistical analysis, the Statistical Package for Social Sciences (SPSS) for Windows 15.0 software (SPSS Inc., Chicago, IL, USA) program was used. For group assessments, one-way ANOVA test was used for variables with normal distribution and the Kruskal Wallis test was used for variables without normal distribution. If differences were present, the Mann Whitney U test was used to compare two groups. The chi-square test was used to research the differences between categoric variables in the groups. For comparison of repeated measurements within the groups, ANOVA was used for comparison of measurements with normal distribution. The Bonferroni multiple comparison test was used to determine which measurements cause the difference, if significant differences were present. To compare categoric variables within the groups, the McNemar chi-square test was used. For all statistical analyses, the limit of significance was assessed as ($p<0.05$).

Results

There were no statistically significant differences between the groups in terms of mean age, body mass index, mean disease duration and sex, respectively ($p=0.333$, $p=0.144$, $p=0.944$, $p=0.285$). In the first group, the FFD was mean 23.5 cm initially, and this value fell to 10.53 after treatment ($p<0.001$). In group 2 and 3 significant reductions were observed ($p<0.001$, $p<0.001$). In Group 2 the initial FFD was 23.2 cm, while it fell to 11.03 cm after treatment, while in Group 3 these values were 23.5 cm and 11 cm, respectively. Statistically significant improvements were observed in all three groups after physiotherapy compared to initially for modified Schober and paravertebral lumbar muscle spasm ($p<0.05$). When lumbar lateral flexion ($p=0.763$), modified lumbar Schober ($p=0.669$), finger to floor distance ($p=0.844$), lumbosacral paravertebral muscle spasm ($p=0.538$) and straight leg raise test ($p=0.343$) improvements were compared between the groups after physiotherapy, there were no statistical differences observed (Table 1). In all three groups, when the severity of pain at rest, at night and when moving are evaluated, the VAS scores showed a statistically significant reduction after physiotherapy ($p<0.001$). The Oswestry score measuring disability showed significant improvement after physiotherapy compared to before in all three groups ($p<0.001$). The LANSS score determining the presence of neuropathic pain showed no differences within the groups in the three groups ($p>0.05$). Evaluations after physiotherapy showed no statistically significant differences between severity of pain at rest ($p=0.447$), at night ($p=0.653$) and when moving ($p=0.661$), Oswestry Low back pain disability scores ($p=0.347$) and neuropathic pain presence assessed with LANSS ($p=0.856$) between the groups (Table 2). Comparisons within and between groups at check-ups 3 months later observed the FFD was 10.5 cm in the first group, 10.7 cm in the second group and 11.73 cm in the third group. Compared with initial values, there were significant reductions in FFD for all three groups at 3rd month control ($p<0.001$, for all). Lateral flexion improved from 46.1 cm to 45.0 cm in the first group; however, this was not statistically significant ($p=0.569$). In the second and third groups, statistically significant improvements were observed within the groups, respectively ($p=0.006$, $p<0.001$). The modified Schober and paravertebral lumbar muscle spasm showed significant improvement at 3-month check-up compared to initial values for all three groups ($p<0.05$). The proportion of patients with paravertebral muscle spasm was 80.6% in the 1st group initially, while this improved to 0% at the end of the 3rd month. For patients in the 2nd and 3rd groups, the proportion with PVMS in the 3rd month was 10%. When the lumbar lateral flexion, modified lumbar Schober and FFD measurements and lumbosacral paravertebral muscle spasm are compared between the groups in the 3rd month after treatment, no statistically significant difference was observed ($p>0.05$) (Table 3). Mean VAS value for resting pain was 39.7 mm in the 1st group initially and reduced to 16.5 mm at the end of the 3rd month. In the 2nd and 3rd groups, this value fell to 14.8 mm and 15.3 mm. In all three groups, the improvement in resting pain was found to be statistically significant compared to initial values ($p<0.001$). Mean VAS value for night pain was 10.1 mm in the 1st group, 5.8 mm in the 2nd group and 8.1 mm in the 3rd group and compared to initial values the measurements in the 3rd month showed significant reduction in all three groups ($p<0.001$). The movement pain and Oswestry score in all three groups showed significant improvement in the 3rd month ($p<0.001$). Only the proportion of patients with neuropathic pain determined with the LANSS score did not show improvement within the groups for all groups ($p=1.000$). In the 3rd month after physiotherapy, when the pain severity values at rest, at night and when moving VAS are compared between the groups, there was no difference between the groups. There was no statistically significant difference identified between the three groups in terms of Oswestry low back pain disability scores and presence of neuropathic pain evaluated with the LANSS ($p>0.05$) (Table 4).

Table 1. Comparison within and between groups for finger-floor distance measurement, paravertebral muscle spasm, lateral flexion and modified lumbar Schober values at first check-up after physiotherapy

	Group 1 (n=30)		**Group 2 (n=30)**		**Group 3 (n=30)**		**p**
	Mean±SD		**Mean±SD**		**Mean±SD**		
	BT	**AT**	**BT**	**AT**	**BT**	**AT**	
FFD (cm)	23.5±6.1	10.53±4.2	23.2±6.7	11.03±3.7	23.5±5.7	11.0±3.6	0.844
	p<0.001		**p<0.001**		**p<0.001**		
L. Flex. (cm)	46.1±7.3	44.7±2.7	47.6±2.9	44.6±2.5	47.4±3.1	44.3±2.6	0.763
	p=0.568		p=0.077		**p<0.001**		
M. Schober (cm)	6.5±1.5	7.50±1.52	6.1±1.1	7.18±1.40	6.1±1.2/	7.32±1.14	0.669
	p=0.029		**p=0.017**		**p<0.001**		
PVMS, n(%)							
(+)	29(96.7)	5(16.7)	28(93.3)	3(10)	25(83.3)	3(10)	0.538
(-)	1(3.3)	25(83.3)	2(6.7)	27(90)	5(16.7)	27(90)	
	p<0.001		**p<0.001**		**p<0.001**		

FFD: Finger-floor Distance, PVMS: Paravertebral Muscle Spasm, SD: Standard Deviation, BT: Before Treatment, AT: After Treatment

Table 2. Comparison within and between groups for pain scores, LANSS pain scale, Oswestry low back pain disability questionnaire and visual analog scale results after physiotherapy

	Group 1 (n=30)		**Group 2 (n=30)**		**Group 3 (n=30)**		**p**
	Mean±SD		**Mean±SD**		**Mean±SD**		
	BT	**AT**	**BT**	**AT**	**BT**	**AT**	
Pain at rest	39.7±8.0	16.0±6.0	40.7±8.0	15.3±7.5	39.5±8.4	13.8±6.5	0.447
	p<0.001		**p<0.001**		**p<0.001**		
Pain at night	32.3±8.7	9.8±7.1	31.2±7.7	8.6±7.3	31.7±7.7	8.3±5.1	0.653
	p<0.001		**p<0.001**		**p<0.001**		
Pain when moving	69.8±8.7	30.3±5.5	68.3±7.7	28.8±7.1	70.2±9.2	29.8±6.6	0.661
	p<0.001		**p<0.001**		**p<0.001**		
Oswestry score	0.47±0.03	0.4±0.002	0.47±0.02	0.34±0.02	0.47±0.03	0.34±0.03	0.347
	p<0.001		**p<0.001**		**p<0.001**		
LANSS, n(%)							
(+)	3(10)	3(10)	2(6.7)	2(6.7)	3(10)	2(6.7)	0.856
(-)	27(90)	27(90)	28(93.3)	28(93.3)	27(90)	28(93.3)	
	p=1.000		p=1.000		p=0.856		

BT: Before Treatment, AT: After Treatment, SD: Standard Deviation

Table 3. Comparison within and between groups for finger-floor distance measurement, paravertebral muscle spasm, lateral flexion and modified lumbar Schober values at check-up after three months after physiotherapy

	Group 1 (n=30)		**Group 2 (n=30)**		**Group 3 (n=30)**		**p**
	Mean±SD		**Mean±SD**		**Mean±SD**		
	BT	**AT**	**BT**	**AT**	**BT**	**AT**	
FFD (cm)	23.5±6.1	10.5±4.0	23.2±6.2	10.7±4.0	23.5±5.7	11.7±2.93	0.393
	p<0.001		**p<0.001**		**p<0.001**		
L. Flex (cm)	46.1±7.3	45.0±2.6	47.6±2.9	43.4±7.79	47.4±3.1	44.26±2.87	0.514
	p=0.569		p=0.006		p<0.001		
M. Schober (cm)	6.5±1.5	7.8±1.5	6.2±1.2	7.6±1.7	6.1±1.2	7.4±1.3	0.621
	p=0.003		**p<0.001**		**p<0.001**		
PVMS, n(%)							
(+)	25(83.3)	0(0)	28(93.3)	3(10)	25(83.3)	3(10)	0.800
(-)	5(16.7)	30(100)	2(6.7)	27(90)	5(16.7)	27(90)	
	p<0.001		**p<0.001**		**p<0.001**		

FFD: Finger-floor Distance, PVMS: Paravertebral Muscle Spasm, SD: Standard Deviation, BT: Before Treatment, AT: After Treatment

Table 4: Comparison within and between groups for pain scores, LANSS pain scale, Oswestry low back pain disability questionnaire and visual analog scale results three months after physiotherapy

	Group 1 (n=30) Mean±SD		Group 2 (n=30) Mean±SD		Group 3 (n=30) Mean±SD		p
	BT	AT	BT	AT	BT	AT	
Pain at rest	39.7±8.0	16.5±7.3	40.7±8.0	14.8±7.0	39.5±8.4	15.3±6.6	0.719
	p<0.001		**p<0.001**		**p<0.001**		
Pain at night	32.3±6.9	10.1±8.6	31.2±7.7	5.8±6.9	31.7±7.79	8.7±5.6	0.071
	p<0.001		**p<0.001**		**p<0.001**		
Pain when moving	69.8±8.79	29.5±7.5	68.3±7.7	29.1±6.8	70.2±9.7	32.6±6.9	0.116
	p<0.001		**p<0.001**		**p<0.001**		
Oswestry score	0.5±0.03	0.4±0.02	0.47±0.02	0.34±0.02	0.47±0.03	0.35±0.023	0.100
	p<0.001		**p<0.001**		**p<0.001**		
LANSS, n(%)							
(+)	3(10)	3(10)	2(6.7)	2(6.7)	3(10)	2(6.7)	0.856
(-)	27(90)	27(90)	28(93.3)	28(93.3)	27(90)	28(93.3)	
	p=1.000		p=1.000		p=1.000		

BT: Before Treatment, AT: After Treatment, SD: Standard Deviation

Discussion

In our study, we used applications of continuous and intermittent traction, a physiotherapy modality, for patients with diagnosis of lumbar disk hernia and researched these treatments in terms of pain, clinical and functional status and the superiority compared to placebo traction.

The majority of lumbar disk hernias are observed from 30-55 years of age, though it may be seen in adolescents and the elderly.[14] In our study, the mean ages in the groups complied with the literature and were 38 years in Group 1, 36 years in Group 2 and 41 years in Group 3.

Occupational groups where low back pain is frequently observed include occupations requiring intense physical labor power, lifting, turning, lifting while turning, long duration sitting and driving vehicles.[15] In our study, there was no statistically significant difference between the groups in terms of occupational distribution. There was no statistically significant difference between the groups in terms of mean age, body mass index, mean duration of illness and gender. In our study, the FFD, modified Schober, paravertebral lumbar muscle spasm and lumbar lateral flexion showed statistically significant amelioration in all three groups after physiotherapy compared to initial values. It was observed the improvement continued at 3-month check-up. However, when the improvements in these clinical parameters were compared between the three groups, there was no significant difference found. Resolution of pain and paravertebral muscle spasm and their clinical reflections of FFD, and modified Schober were identified to improve in all three groups. These improvements may be explained by the effect of infrared, ultrasound, traction and exercises on patients. In the literature, it is stated that traction may resolve spasms caused by the sensorio-motor reflex route, with an effect similar to massage on muscles during stretch-relaxation periods.[11,12]

Leventoğlu et al. researched the efficacy of 40 traction sessions on 34 patients with acute lumbar disk hernia diagnosis by randomizing patients into two groups. They applied traction with 50% body weight force for 30 minutes in the study group and maximum 20% of body weight force in the control group.

All patients additionally had NSAID medications, surface heating, TENS and low back exercise programs organized. Check-ups at 2, 4 and 12 weeks identified clear improvements in pain severity, FFD findings in the 2 groups; however, there were no significant differences between the treatment groups, similar to our study. Additionally, linked to this, the patients had improved functional capacity with reduced disability identified.[16]

Matthews et al. performed a double-blind study applying traction to 27 sciatica patients. The traction group comprised 13 patients, while there were 14 patients in the control group. Both groups had traction treatment 5 days per week for 3 weeks for 30 minutes per session and a total of 15 sessions. While 36 kg traction was applied to the treatment group, the control group had very low weight not exceeding 9 kg traction. Patients were evaluated with straight leg raise test and verbal pain criteria.

Improvement in mean pain scores were identified for 28.8% of cases in the treatment group and 18.9% of cases in the control group. In terms of results between the groups, though a statistically significant difference was not identified, patients tended to improve with traction treatment.[17] In our study, in the three groups, resting, nighttime and movement pain severity and Oswestry scores evaluating disability showed significant reductions after physiotherapy; however, there was no significant difference found between the groups. The LANSS score determining the presence of neuropathic pain did not show differences within the groups for the three groups. Similar results to our study were obtained in a study of 61 patients with subacute lumbar disk hernia treated in 2 groups. The first group had 10 sessions of intermittent traction therapy, while the second group had 10 sessions

of placebo traction (pulling force 10-20% of body weight). The results of the study identified significant improvements in Oswestry score and VAS in both groups after treatment; however, there was no statistically significant difference identified between the two groups.[18] Treatment with physiotherapy and combined treatment was not identified to have a significant effect on neuropathic pain in patients in the three groups. The probable reason for this is that the mechanism of neuropathic pain is different to the mechanism of mechanical pain and may be a more chronic process. In a study conducted on patients with acute lumbar disc herniation, traction, ultrasound, and low-dose laser applications were compared before and 3 months after treatment.[19]

Though there is no consensus about the application of traction treatment, generally weight, duration and traction type are considered. In our study the placebo traction group had 10-20% of body weight force, the intermittent traction group began with 25% body weight and increased to a maximum of 50% body weight pulling force administered with 40 s pull and 10 s relaxation periods for 30 minutes, and the continuous traction group had 25% body weight force applied for 1 hour. The first day of treatment began with 10 minutes and the treatment durations were gradually increased. Our reason for increasing both the duration and the pulling force in stages as treatment parameters is to observe the patient's tolerance and to prevent any complications that may develop after traction. We took care that the pulling force did not exceed 45 kg, because forces above 45 kg are reported to limit breathing in the chest cage and venous return and affect cardiovascular status.[20]

In references it is recommended that intermittent traction is better tolerated and that it be applied for patient comfort, while in our study both continuous and intermittent traction applications were well tolerated.[21] The use of combined treatment in lumbar disk hernia patients may cause problems in interpreting the efficacy of the treatments used.[16,22,23]

Considering this situation, it is difficult to clearly reveal the effect of traction on the treatment results in our study.

As a conclusion, in our study using 25-50% body weight for intermittent traction and 25% body weight for continuous traction for lumbar disk hernia, no statistically significant superiority was shown. Additionally, both types of traction were not identified to have statistically significant superiority to placebo traction using 10-20% of body weight. Nearly 50% of acute disk hernia fully heal as a result of natural progression in a few weeks independent of treatment and adding other conservative treatments and exercise programs apart from traction prevents determination of the clear effect of traction. Traction should not be a treatment modality used on its own, but it is considered to be more effective as a part of a treatment program including other physiotherapy methods. There is a need for well-planned placebo-controlled randomized studies to evaluate the type, duration and pulling force in traction.

Compliance with Ethical Standards

The study received permission from Izmir Atatürk Education and Research Hospital Chief of Staff Local Ethics Committee, decision no: 624, date: 04/06/2009. Written informed consent was obtained from all study participants.

Conflict of Interest

The authors report no conflicts of interest.

Author Contribution

Authors contributed equally to this work.

Financial Disclosure

None

References

1. Demir Ş. Taştekin N, Birtane M. Lomber omurganın biyomekaniği. *Türkiye Klinikleri J PM&R-Special Topics*. 2011;4(1):6-11.
2. Dündar Ü, Kavuncu V. Lomber disk hernisinde tanı ve tedavi. *Klinik Aktüel Tıp Derg*. 2006;11(2):45-53.
3. Akarırmak Ü. Lomber disk herniasyonlarının epidemiyolojisi. In: Akarırmak Ü, Sarı H, ed. *Lomber Disk Hernileri*. İstanbul: Nobel Tıp Kitabevi; 2001:22-31.
4. Baldwin NG. Lumbar disc disease: the natural history. *Neurosurg Focus*. 2002;13(2):E2. doi:10.3171/foc.2002.13.2.3
5. Sarper T. Bel ağrılarında epidemiyoloji. *Klinik Aktüel Tıp Derg*. 2006;11(1):10-14.
6. Özbayır T. Nörolojik travmalar. In: Karadakovan A, Aslan FE, ed. *Dahili ve Cerrahi Hastalıklarda Bakım*. Adana: Nobel Kitabevi; 2010:1245-1274.
7. Tüzün Ş. Bel ve bacak ağrıları. In: Tüzün Ş, Eryavuz M, Akarırmak Ü, ed. *Hareket Sistemi Hastalıkları*. İstanbul: Nobel Tıp Kitabevi; 1997:245-260.
8. Sinaki M, Mokri B. Low back pain and disorders of the lumbar spine. In: Braddom RL, ed. *Physical Medicine and Rehabilitation*. 2nd Edition. Philadelphia: WB Saunders; 2000:853-858.
9. Borenstein DG, Wiesel SW, Boden SD. *Low Back Pain: Medical Diagnosis and Comprehensive Management*. Philedelphia: WB Saunders; 1995:183-217.
10. Demir PY, Ülger Ö. Lumbosakral bölge, patolojileri ve fizyoterapisi. In: Karaduman A, Yılmaz ÖT, ed. *Fizyoterapi ve Rehabilitasyon*. 2. Baskı. Ankara: Pelikan Yayıncılık; 2016:27-61.
11. Brault JS, Kappler RE, Grogg BE. Manipulation, traction and massage. In: Braddom R, ed. *Physical Medicine and Rehabilitation*. Philadelphia: Saunders; 2007:437-457.
12. Sarı H. Traksiyon. In: Oğuz H, ed. *Tıbbi Rehabilitasyon*. Istanbul: Nobel Kitabevleri; 2004:363-373.
13. Sarı H. Traksiyon. In: Sarı H, Tüzün Ş, Akgün K, ed. *Hareket Sistemi Hastalıklarında Fiziksel Tıp ve Yöntemleri*. Istanbul: Nobel Tıp Kitabevleri; 2002:97-107.
14. Hizmetli S, Hayta E. Bel ağrısı ve disk hernileri. *Clinic Medicine*. 2007;1:38-64.
15. Berker E. Belde ağrı kaynakları. In: Özcan E, ed. *Bel Ağrısı Tanı ve Tedavisi*. İstanbul: Nobel Kitabevi; 2002:45-933.

16. Leventoğlu F, Yılmaz H, Uğurlu H. Lomber disk hernili hastaların tedavisinde traksiyonun klinik etkinliği. *Ege Fiz Tıp ve Reh Derg*. 2004;10(1):23-28.
17. Matthews LA, Hickling J. Lumbar traction: a double-blind controlled study for sciatica. *Rheumatol Rehabil*. 1975;14(4):222-225. doi:10.1093/rheumatology/14.4.222
18. Uzunca K. Ankilozan Spondilitte Hastalık Aktivasyonu Ve Fonksiyonel Yetersizliğin Değerlendirilmesi [Uzmanlık tezi]. Edirne, Türkiye: Trakya Üniversitesi; 2000.
19. Unlu Z, Tascı S, Tarhan S, Pabuscu Y, Islak S. Comparison of 3 physical therapy modalities for acute pain in lumbar disc herniation measured by clinical evaluation and magnetic resonance imaging. *J Manipulative Physiol Ther*. 2008;31(3):191-198. doi:10.1016/j.jmpt.2008.02.001
20. Atchison JW. Stoll S. Gıllear WG. Manipulation, traction and massage In: Braddom RL, ed. *Physical Medicine and Rehabilitation.* 1st Edition. Philadelphia: WB saunders company; 1996.
21. DeLisa JA. *Fiziksel Tıp ve Rehabilitasyon: İlkeler ve Uygulamalar*. Arasıl T, Çev-ed. 4. Baskı. Ankara: Güneş Kitabevleri; 2007:1-304.
22. Yıldırım Ç, Bütün B, Çubuk M, AkyokuĢ A. Akut lomber disk hernilerinde intermitant traksiyon etkinliğinin klinik ve ileri görüntüleme yöntemleri ile değerlendirilmesi. *Ege Fiz Tıp ve Reh Derg*. 2001;7(1):7-14.
23. Peker Ö. Lomber disk hernilerinde fizyoterapinin etkinliğinin klinik ve MRG ile değerlendirilmesi. *Dokuz Eylül Üniv Tıp Fak Derg*. 1995;9(1):77-87.