High-Force Versus Low-Force Lumbar Traction in Acute Lumbar Sciatica Due to Disc Herniation: A Preliminary Randomized Trial

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Abstract

Objective: This study compared the effects of high-force versus low-force lumbar traction in the treatment of acute lumbar sciatica secondary to disc herniation.

Methods: A randomized double blind trial was performed, and 17 subjects with acute lumbar sciatica secondary to disc herniation were assigned to high-force traction at 50% body weight (BW; LT50, n = 8) or low force traction at 10% BW (LT10, n = 9) for 10 sessions in 2 weeks. Radicular pain (visual analogue scale [VAS]), lumbo-pelvic-hip complex motion (finger-to-toe test), lumbar-spine mobility (Schöber-Macrae test), nerve root compression (straight-leg-raising test), disability (EIFEL score), drug consumption, and overall evaluation of each patient were measured at days 0, 7, 1, 4, and 28.

Results: Significant ($P < .05$) improvements were observed in the LT50 and LT10 groups, respectively, between day 0 and day 14 (end of treatment) for VAS (–44% and –36%), EIFEL score (–43% and –28%) and overall patient evaluation (+3.1 and +2.0 points). At that time, LT50 specifically improved in the finger-to-toe test (–42%), the straight-leg-raising test (+58), and drug consumption (–50%). No significant interaction effect (group-by-time) was revealed, and the effect of traction treatment was independent of the level of medication. During the 2-week follow-up at day 28, only the LT10 group improved ($P < .05$) in VAS (–52%) and EIFEL scores (–46%). During this period, no interaction effect (group-by-time) was identified, and the observed responses were independent of the level of medication.

Conclusions: For this preliminary study, patients with acute lumbar sciatica secondary to disc herniation who received 2 weeks of lumbar traction reported reduced radicular pain and functional impairment and improved well-being regardless of the traction force group to which they were assigned. The effects of the traction treatment were independent of the initial level of medication and appeared to be maintained at the 2-week follow-up. (J Manipulative Physiol Ther 2016;39:645-654)

Key Indexing Terms: *Sciatica; Back Pain; Intervertebral Disc Displacement; Neuropathic Pain*

Introduction

Lumbar traction (LT) is routinely used on its own or in conjunction with other treatments for the management of lumbar sciatica.[1,2] Different modalities of LT have been proposed to create forces (continuous, intermittent, manual, or motorized tractions) in various medical indications (acute and/or chronic lumbago—with or without sciatica—secondary to arthritis of a posterior facet joint, and/or disc herniation) and with various outcome measures and duration of follow-up.[3,4]

Previous studies have emphasized the short-term efficacy of LTs in several indications, such as acute sciatica secondary to disc herniation,[5,6] or in some populations,

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defined, for instance, by an increase in sciatic pain during leg extension movements.[7] More recently, the feasibility of and rationale for mechanical tractions in the management of low back pain has been underlined, emphasizing the importance of subgrouping to assess the effectiveness of LT interventions.[8]

The mechanisms of action of LTs seem to be both mechanical, through separation of the intervertebral motion segments[9-11] leading to a significant decrease in intradiscal pressure,[12-14] and neurophysiological, through the modulation of the pain pathways by analogy with spinal manipulations.[15] Despite these expected mechanical and/or neurologic mechanisms of action, there is currently no clear consensus regarding the amount of force to apply in LT interventions. In this context, comprehensive literature reviews report mainly conflicting or limited evidence to support the beneficial effect of LT versus sham or no treatment in patients with lumbar sciatica.[3,4] Moreover, limited evidence was also identified when assessing the effectiveness of high (≥50% body weight [BW]) versus low (≤20% BW) levels of LT. Taken together, these results are somewhat difficult to interpret, given the heterogeneity of levels, durations, and modalities of tractions; duration of treatment; and medical status of patients.[16-18]

The aim of our study was to compare the effect of two levels (high and low forces) of short-term LT on pain and functional tests of the lower limbs in a specific population of patients presenting with acute lumbar sciatica secondary to disc herniation. We hypothesized that in this particular medical condition, high-level LT might be more effective than low-level LT in decreasing the pain associated with acute sciatica.

Methods

Study Design

This double-blinded and randomized study was performed to compare high versus low level of LT. Outcome assessments were performed at baseline (day 0; D0), at day 7 (D7, middle of treatment), day 14 (D14, end of treatment), and day 28 (D28, after 2 weeks of follow-up).

Participants

Patients were enrolled at the emergency department of the University Hospital Strasbourg (Strasbourg, France) between January 2002 and June 2005 and were followed up for 2 weeks after the end of the treatment. Inclusion criteria were lumbar sciatica of less than 6 weeks' duration secondary to disc herniation as confirmed by pain radiating down the leg along the distribution of the sciatic nerve and positive result of the straight-leg-raising test (SLRT). Nerve root compression was systematically confirmed by lumbar tomodensitometry in concordance with clinical observations. Exclusion criteria were symptoms that persisted for more than 6 weeks, signs of clinical neurologic deficit, lumbar sciatica not caused by disc herniation, and presence of abnormalities on lumbar tomodensitometry. Patients aged less than 18 years, pregnant women, patients on medical leave for more than 3 weeks at inclusion, and patients with history of lumbar surgery or previous LT therapy were also excluded.

Patients received oral and written information and signed the informed consent form before inclusion in the study. The following data were collected: medical history, drug treatments, and history of the current lumbar sciatica problem. General, clinical orthopedic, neurologic, and functional examinations completed the data collection process (Fig 1).

Randomization and Double-Blinding Procedure

This study was approved by the Institutional Ethics Committee of the University Hospital Strasbourg (CPPRB HUS No. 2754; clinical trial registry number NCT02091791). All participants gave consent to being included in this study. The randomization sequence was concealed in consecutively numbered envelopes that were allocated once eligibility was determined. Only the physiotherapist who conducted the LT sessions was aware of the experimental group to which the patients were allocated. Both the investigators and the patients were blinded to the traction levels.

LT Intervention

Patients received 10 LT sessions (5 per week for 2 weeks). They were all randomly oriented either in a high-level LT group (50% of BW, LT50) or in a low-level LT group (10% of BW, LT10).

Patients were asked to lie in dorsal decubitus on a traction table (Fig 2). The dorsal spine rested on the fixed part of the table, and the lumbar spine segment to be treated was positioned at the junction of the fixed and mobile parts of the table. The lower legs were raised and positioned on a stool, with the hips flexed at 60 degrees to place the lumbar spine in slight kyphosis (Fowler position) from the beginning. The lower harness was put around the iliac crests and the upper harness around the bottom of the rib cage. The distance between harnesses was as small as possible to enable application of the traction force to the smallest possible portion of the spine. The patient was able to activate a safety switch to stop the traction if discomfort or excessive pain was experienced. The traction force was progressively applied for 5 minutes, depending on the patient's degree of relaxation and acceptance, and subsequently maintained at the target level (LT50 or LT10) continuously for 20 minutes in both groups. At the end of the session, relaxation was done progressively for 5 minutes, and each patient was asked to rest in the supine position for 5 minutes before standing.

During the study period, patients could take their usual medications. However, only the following painkillers or

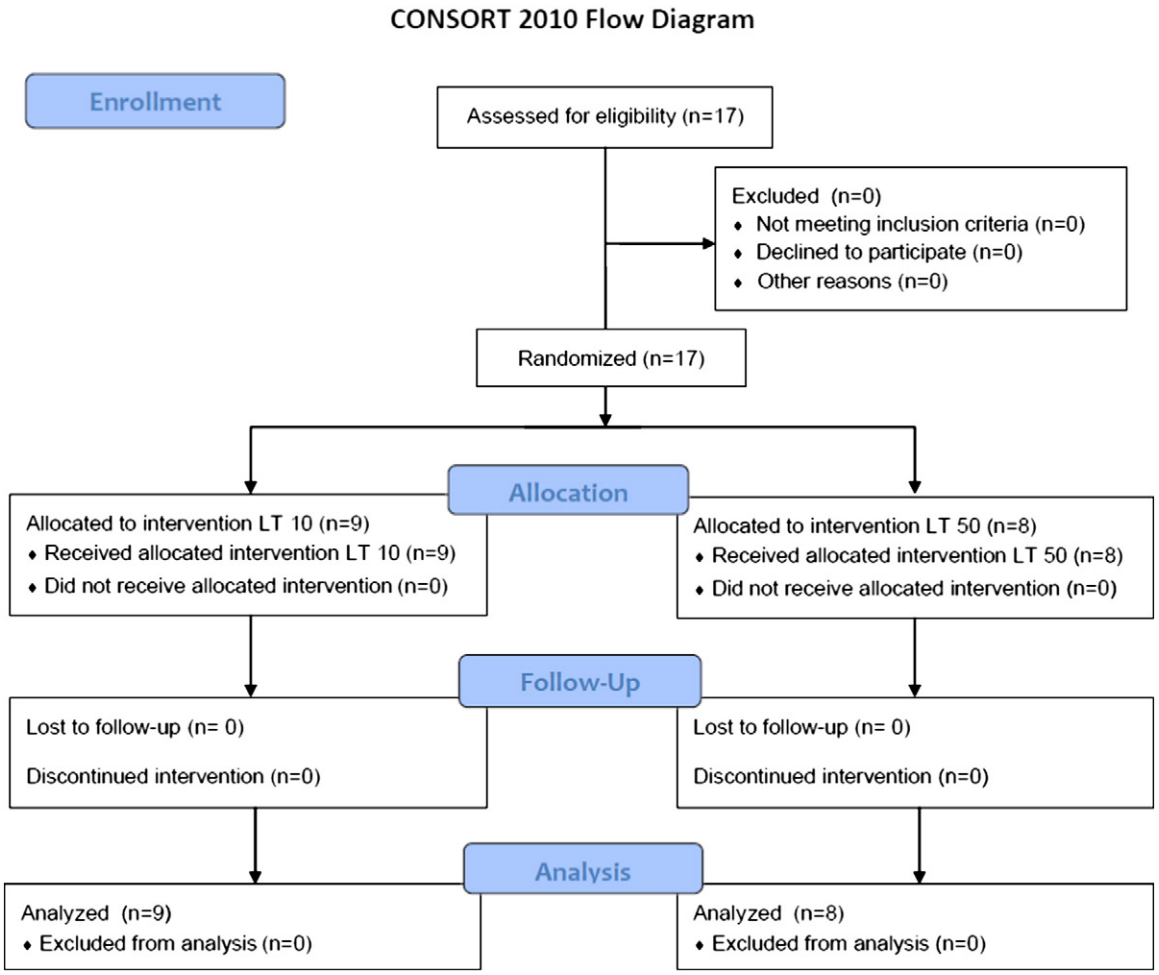

Fig 1. *CONSORT flow chart. Patient flow diagram.*

anti-inflammatory drugs (or a combination) were allowed: ketoprofen, lansoprazole, paracetamol, and dextropropoxyphene in association with paracetamol.

Outcome Assessments

The main outcome was radicular pain, which was measured by using a visual analogue scale (VAS)[19] that graduated from 0 to 100 mm. The secondary outcomes were mobility of the lumbo-pelvic-hip complex, which was evaluated by using the finger-to-toe test (FTT, in centimeters),[20] lumbar spine mobility (in millimeters) assessed by using the Schöber-Macrae test,[21] signs of nerve root compression assessed by using the SLRT, and level of functional impairment determined by using the validated French version of the Roland-Morris Disability Questionnaire known as the échelle d'incapacité fonctionnelle pour l'évaluation des lombalgies (EIFEL) score.[22] Drug consumption was also monitored by using a medication score ranging from 0 to 4 (0: no drug; 1: class I painkillers, if needed; 2: class II painkillers at effective dose; 3: pain-killers at effective dose and nonsteroidal anti-inflammatory drugs, if needed; 4: painkillers and nonsteroidal anti-inflammatory drugs at effective dose). Treatment evaluation (traction intervention + drug consumption) was performed, using a global satisfaction index ranging from 0 to 4 (0: not satisfied; 1: a little satisfied; 2: moderately satisfied; 3: satisfied; 4: very satisfied).

Statistical Analysis

Data are presented as mean ± standard deviation. The level of significance was set at $P < .05$.

Analyses were carried out by using R statistical software (version 3.1.0; R Foundation, Austria, Vienna). For statistical inference, we used Gaussian mixed models,

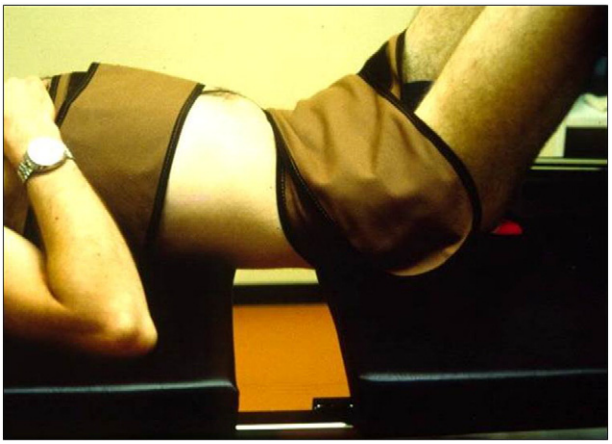

Fig 2. *Traction device. The lumbar spine segment is positioned at the junction of the fixed and mobile parts of the table.*

systematically including a subject random effect. For all variables of interest, group effect (LT50 vs LT10), time effect (D0, D7, D14, D28), and their interactions were included in the models. Analyses were also adjusted on the basal medication score (0-4) to test whether the level of basal medication modified the evolution of the variable during the study follow-up. Mean differences, 95% confidence interval (CI), and *P* values are presented for each significant difference. Those estimates were calculated by using linear contrasts in linear mixed models.

For sample size calculation, we used the main outcome of the study, the group difference in radicular pain, by using a pain VAS. A reduction in the VAS score greater than 25 points out of 100 is classically observed,[14,23,24] but in our study, a difference of 20 points was used as the required difference between groups applicable for the power calculations. Moreover, a group standard deviation of 17 was assumed, on the basis of the results of comparable previous trials.[14,25,26] A sample size calculation was performed on the basis of a two-group *t* test, assuming a maximal dropout rate of 20%.[27] A total of 18 patients were required (9 per group) to detect a 20-point difference with 80% power on a two-sided level of significance of $P = .05$.

Results

Seventeen patients (7 men, 10 women) with acute lumbar sciatica secondary to disc herniation were enrolled in this study. The LT50 and LT10 groups were comparable for age, sex, weight, height, body mass index, level of lesion, duration of treatment, traction force, lumbar pathology, and clinical parameters at baseline (Tables 1 and 2).

Radicular Pain

In the LT50 group, the VAS score decreased significantly by 44% from D0 to D14 (mean difference –26.3; 95% CI –43.5 to –8.9; $P < .001$) and further reduced by 47% from D7 to D28 (mean difference –23.6; 95% CI –40.3 to –6.3; $P < .01$) (Fig 3). The VAS score reduced by 57% (mean difference –28.8; 95% CI –41.8 to –3.7; $P < .0001$) over the course of the study (D0-D28).

In the LT10 group, the VAS score decreased significantly by 38% from D0 to D7 (mean difference –24.5; 95% CI –40.9 to –8.2; $P < .001$) and further reduced by 69%between D14 and D28 (mean difference –21.4; 95% CI –37.7 to –5.1; $P < .01$). The VAS score reduced by 69% (mean difference –34.8; 95% CI –52.6 to –17; $P < .0001$) over the course of the study (D0-D28).

No interaction effect (groups × time) was revealed with regard to pain reduction during the study period ($P = .21$), and the VAS score was independent of the level of medication ($P = .48$).

Lumbo-Pelvic-Hip Complex and Lumbar Spine Mobility

In the LT50 group, FTT decreased significantly by 42% (mean difference –14.4; 95% CI –25.6 to –3.1; $P < .01$) from D0 to D14 with no further reduction from D14 to D28 (Fig 4). In the LT10 group, FTT decreased significantly by 45% (mean difference –17.6; 95% CI –28.3 to –7.0, $P < .0001$) from D0 to D28. No interaction effect (groups × time) was noted with regard to the FTT during this study period ($P = .22$), and the FTT was independent of the level of medication ($P = .33$). No differences were observed within or between groups at any time point for the Schöber-Macrae test.

Straight Leg Raising Test

In the LT50 group, the elevation angle increased significantly by 58% (mean difference 24.4; 95% CI 4.5-44.3; $P < .01$) from D0 to D14 (Fig 5). The elevation angle was improved by 79% (mean difference 33.1; 95% CI 13.3-53.0; $P < .0001$) over the course of the study. In the LT10 group, the elevation angle increased by 89% (mean difference 36.0; 95% CI 17.3-54.7; $P < .0001$) from D0 to D28. No interaction effect (groups × time) was revealed with regard to the SLRT during this study period ($P = .72$), and the SLRT score was independent of the level of medication ($P = .55$).

EIFEL Score

In the LT50 group, the EIFEL score decreased by 43% (mean difference –7.5; 95% CI –11.6 to –3.4; $P < .01$) from D0 to D14 with a total reduction of 57% from D0 to D28 (mean difference –10.0; 95% CI –15.4 to –4.6; $P < .01$) (Fig 6). In the LT10 group, the EIFEL score decreased by 22% (mean difference –3.3; 95% CI –5.4 to –1.3; $P < .05$) from D0 to D7 and was further reduced by 46% (mean difference –4.9; 95% CI –7.7 to –2.1; $P < .01$) from D14 to D28. The total reduction of the EIFEL score amounted to 61% from D0 to D28 (mean

Table 1. *Subjects Characteristics of the LT50 and LT10 Groups at Day 0 (Beginning of the Study)*

Groups	Age (y)	Sex	Height (cm)	Weight (kg)	BMI	Level of Lesion	Duration of Treatment Before Inclusion (d)	Traction Force (kg)
LT50								
1	40	F	165	62	22.8	L5-S1	7	30
2	39	M	174	98	32.4	L5-S1	6	49
3	33	F	165	59	21.7	L5-S1	11	30
4	21	F	158	59	23.6	L4-L5	7	30
5	18	F	172	72	24.3	L5-S1	7	35
6	30	M	175	70	22.9	L5-S1	10	35
7	52	F	182	75	22.6	L5-S1	9	37
8	31	F	170	88	30.4	L4-L5	9	44
Mean ± SD	33 ± 11		170 ± 7	73 ± 14	25.1 ± 4		8.1 ± 1.7	36.2 ± 7.0
LT10								
1	35	M	182	70	21.1	L4-L5	7	7
2	38	F	175	85	27.8	L4-L5	10	8
3	44	M	175	70	22.9	L5-S1	8	7
4	30	F	165	83	30.5	L5-S1	7	8
5	33	M	172	101	34.1	L5-S1	9	10
6	22	F	185	78	22.8	L5-S1	12	8
7	36	M	168	89	31.5	L5-S1	8	9
8	21	F	165	55	20.2	L5-S1	7	6
9	38	M	176	73	23.6	L4-L5	12	7
Mean ± SD	33 ± 8		174 ± 7	78 ± 13	26 ± 5		8.9 ± 2.0	7.8 ± 1.2
Significance	NS		NS		NS		NS	

BMI, body mass index; *F,* female; *LT10,* lumbar traction with a force set at 10% of the body weight; *LT50,* lumbar traction with a force set at 50% of the body weight; *M,* male.

difference –9.1; 95% CI –12.3 to –5.8; $P < .001$). No interaction effect (groups × time) was revealed with regard to the EIFEL score during this study period ($P = .78$), and the EIFEL score was independent of the level of medication ($P = .54$).

Drug Consumption

In the LT50 group, drug consumption decreased by 50% (mean difference –1.75; 95% CI –3.1 to –0.4; $P < .05$) from D0 to D14. The total reduction of drug consumption was 61% over the course of the study (mean difference –2.1; 95% CI –3.2 to –1.0; $P < .01$). In the LT10 group, drug consumption decreased by 55% (mean difference –1.88; 95% CI –3.1 to –0.6; $P < .01$) from D0 to D28. No interaction effect (groups × time) was revealed concerning drug consumption during this study period ($P = .79$).

Overall Evaluation of the Treatment

In the LT50 group, the satisfaction score increased from D0 to D7 (mean difference 2.5; 95% CI 1.4-3.6; $P < .01$) and from D0 to D28 (mean difference 2.5; 95% CI 1.3-3.7; $P < .01$). In the LT10 group, the satisfaction score increased from D0 to D7 (mean difference 2.6; 95% CI –3.0 to –2.1; $P < .001$) and from D0 to D28 (mean difference 2.9; 95% CI 2.0-3.6; $P = .001$). No interaction effect (groups × time) was revealed with regard to the overall evaluation of the treatment during this study period ($P = .71$), and the satisfaction score was independent of the level of medication ($P = .53$). No adverse or unintended effects were observed in either group.

Discussion

This study reports rapid reduction in radicular pain with short-term LT intervention in patients specifically diagnosed with acute lumbar sciatica caused by disc herniation. Additionally, pain reduction was accompanied by a decrease in drug consumption, improvement in lumbar mobility, and reduction in signs of nerve root compression and functional disability, regardless of the level of applied traction force.

Characteristics of the LT Intervention

Previous works in the field of LT have repeatedly observed that traction interventions have anecdotal or no beneficial effects on leg pain. However, these reports also noted that the protocols used in most of the traction studies had experimental limitations, thus potentially negating any presumable beneficial effects of traction intervention.[3,4] Of note, despite the scientific skepticism surrounding the use of LTs for the management of lumbar-sciatic pain, this type of intervention is still commonly used by physiotherapists as a beneficial treatment in clinical settings.[28] Therefore,

Table 2. *Baseline Clinical Parameters of the LT10 and LT50 Groups at Day 0 (Beginning of the Study)*

	LT10	LT50
VAS (mm)	65.2 ± 9.2	60.5 ± 26.4
Straight leg raising test (degrees)	40.5 ± 16.8	41.8 ± 14.8
Finger to toe test (cm)	38.8 ± 14.7	34.6 ± 15.2
Schöber-Macrae test (mm)	24.8 ± 15	19.8 ± 7
EIFEL score	14.8 ± 3.9	17.5 ± 5.9
Medication score (0-4)	3.67 ± 0.7	3.5 ± 1

LT10, lumbar traction with a force set at 10% of the body weight; *LT50,* lumbar traction with a force set at 50% of the body weight; *VAS,* visual analogue system.

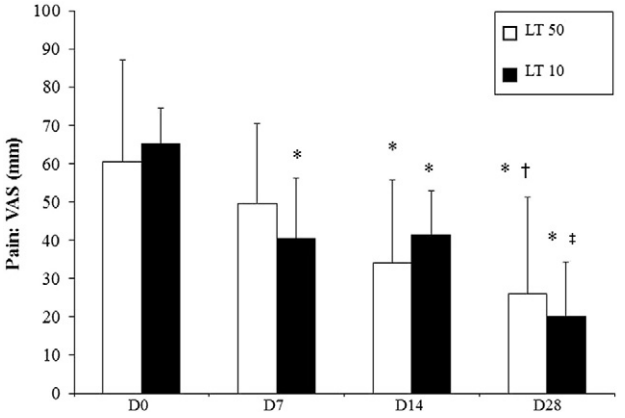

Fig 3. *Effect of lumbar tractions (LTs) corresponding to 50% of body weight (LT50 group; n = 8) and 10% of body weight (LT10 group; n = 9) on pain, assessed using the pain visual analogue scale (VAS) at inclusion (day 0 [D0]), during treatment (day 7 [D7] and day 14 [D14]) and 14 days after the end of treatment (day 28 [D28]). *Significantly different compared with D0 (P < .05). †Significantly different compared to D7 (P < .05). ‡Significantly different compared with D14 (P < .05).*

the current study explored a specific population of patients who presented with acute leg pain of lumbar-sciatic origin. Because of the etiology of the pain that was expected to emerge as a direct result of sciatic nerve root compression, this population was hypothesized to benefit from any positive effect of LTs.

An interesting new aspect of the present study is found in the characteristics of the traction program. First, the duration of the traction sessions was fixed at 30 minutes, including the time for tension to rise and decline at the beginning and end of the traction session, respectively. Additionally, the time at the target level of tension (10% or 50% of the patient's BW) amounted to 20 minutes. These values are approximately 2 to 3 times longer than the duration of previous traction interventions in this population.[7,8] Combined with the higher frequency of the weekly traction sessions (5 times per week), the present program of LT was designed to present a unique total duration of traction amounting to 300 minutes for each patient on a voluntary basis, thereby making the reported LT intervention one of the strongest to date. It is worth noting that all traction sessions were well tolerated by the patients, with no adverse events occurring during the course of the experiment.

Effect of LT Intervention on Leg Pain

All published studies on patients with lumbar sciatica who received spinal traction therapy reported that overall, pain decreases independently of the type of traction.[3,4] In our study, we found that our specific program of LTs led to an approximately 40% reduction of the VAS score for radicular pain after 1 to 2 weeks of treatment, whatever the traction force (10% vs 50% BW). A further reduction of VAS scores of 50% to 70% was observed beyond 1 to 2 weeks of traction, again with no difference between traction forces. These results suggest a progressive and continuous reduction of radicular pain with the traction interventions and are in agreement with previous studies on the efficacy of spinal traction for treating lumbar sciatica, which reported that pain decreased between 19% and 66%.[18,23,29] For example, in the study by Beurskens et al.,[29] in which two traction forces (50% and 20% of BW) were compared, pain decreased by 60% in both groups after a 5-week intervention in patients with low back pain. Similar results were obtained by Reust et al.,[18] who compared daily traction sessions of 50 kg (high) to 5 kg (sham) and 15 kg (light) over 12 days and found a decrease of 50% to 55% in the VAS score, independent of the traction force, in patients presenting with lumbar sciatica. Pain reduction was also observed when lower traction forces (1 kg and 7 kg)[23] or different traction modalities were used. A pain reduction of 40% was previously reported with autotractions and manual tractions,[30,31] and a reduction of 75% with continuous tractions.[32] A global beneficial effect of LT was also reported in patients with lumbar sciatica with no specific treatment effect after continuous versus intermittent tractions,[33] auto-tractions versus passive tractions,[34] and inverted versus conventional tractions[35] or physiotherapy.[36] Therefore, our results, combined with the findings of previous works, suggest that despite strong traction intervention, no additional effect of high (50% BW) versus low (10% BW) level of traction can be observed on acute leg pain of lumbar-sciatic origin.

Effect of LT Intervention on Secondary Criteria

In our patients, reduction in leg pain was accompanied by a comparable decrease in the use of painkillers in both groups, as previously reported.[16,23,37,38] In the study by Beurskens et al.,[29] in which traction forces similar to ours were applied, drug intake at 12 weeks was more significant in the control group than in the traction group (34% vs 25%). Our study also highlights the presence of functional

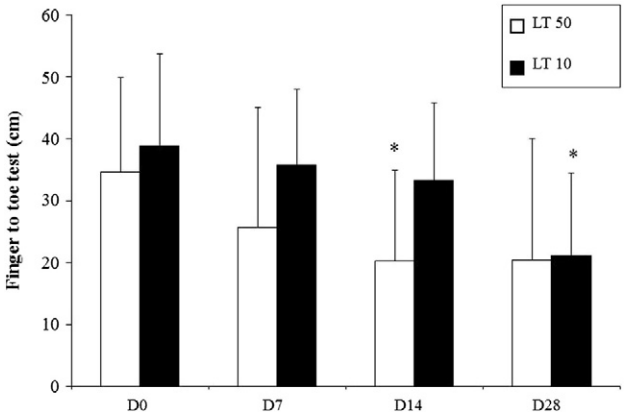

Fig 4. *Effect of lumbar tractions (LTs) corresponding to 50% of body weight (LT50 group; n = 8) and 10% of body weight (LT10 group; n = 9) on at inclusion (day 0: D0), during treatment (day 7 [D7] and day 14 [D14]) and 14 days after the end of treatment (day 28 [D28]). *Significantly different compared with D0 (P < .05).*

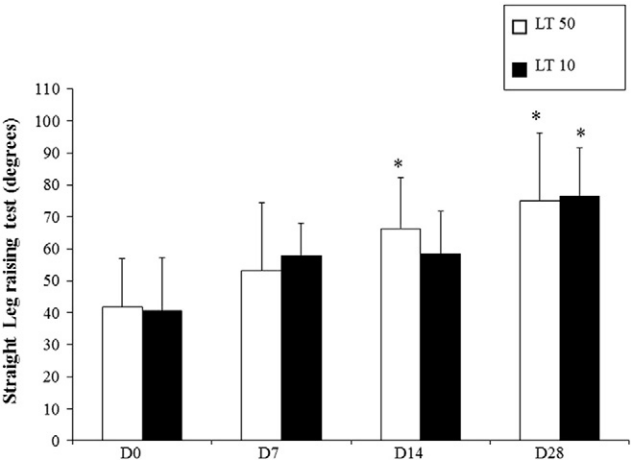

Fig 5. *Effect lumbar tractions (LTs) corresponding to 50% of body weight (LT50 group; n = 8) and 10% of body weight (LT10 group; n = 9) on the straight-leg-raising test (elevation angle) at inclusion (day 0 [D0]), during treatment (day 7 [D7] and day 14 [D14]) and 14 days after the end of treatment (day 28 [D28]). P < .001: significantly different compared with D0.*

benefits (decrease of the disability score by more than 50% in both groups). Previous studies on lumbar sciatica treated with LTs[29,31,39] reported reductions of disability scores between 19% and 64%. This wide range could be explained by the use of different scales to measure disability (eg, the Oswestry Disability Index or the Roland Morris Disability Questionnaire). Lumbar traction might also be efficient in reducing disability in patients with chronic lumbago.[40,41]

Although data on the effect of LTs on the SLRT score are conflicting,[16,17,23,35] it is conceivable that tractions might alleviate the mechanical compression caused by disc pathology either directly (by reduction of the hernia volume, generation of negative intradiscal pressure, or opening of the foraminal spaces)[42] or indirectly (by relaxation of the paravertebral muscles[33] or pain relief through stretching of the articular capsules or other support structures[13]). In our study, the improvement of the SLRT score was accompanied by an overall improvement in the lumbo-pelvic-hip complex mobility, as indicated by the FTT score reduction of more than 40% in both groups, which is comparable with values previously reported in the literature.[17,18,29] Conversely, lumbar mobility (Schöber-Macrae test) did not improve after the present intervention, whatever the level of LT. Other studies, which used different intervention protocols, have already reported limited improvement in lumbar mobility after tractions,[16,43] without providing any explanation for the underlying mechanisms.

Finally, the global patient evaluation of the treatment was satisfactory, with no difference between groups, as previously reported in other studies (overall satisfaction between 47% and 90%).[29,39] Our strong traction intervention was well tolerated by the study patients.

Globally, all the parameters evaluated in the present study improved similarly in both groups, suggesting that a "high" level of traction force (50% BW) does not lead to greater benefits compared to a "low" one (10% BW). Despite the longer duration and the greater frequency of our traction sessions, this finding is in agreement with many studies on the efficacy of LTs for lumbar sciatica, in which no difference between low-force and high-force tractions was found.[17,18,20,23,29,32,39,43,44] Moreover, previous studies in which LTs were compared with other treatments reported that in the case of lumbar sciatica (independent of its origin), the effect of LTs is significant but not greater than that of other treatment modalities, such as physical therapy,[25,37,44-46] isometric muscle exercises,[20,30] wearing of a corset,[43] or spinal manipulation.[47] In only two studies[5,48] were tractions reported to be more effective than transcutaneous neurostimulation or physical therapy, but these later observations were made on patients with chronic lumbar sciatica. In the case of acute sciatica, on the basis of the available results, it is difficult to reach a conclusion because symptom duration was not always specified or was highly variable (mean 9.7 weeks, range 3-52 weeks).[4]

Limitations

Our study did not include a control group, which would have allowed for better determination of whether high-level traction has a more beneficial effect compared with low-level traction or passive rest. For ethical reasons, such an experimental group could not be included in the present study. Despite this limitation, we believe our conclusion (ie, no difference between high and low traction level) is still valid. Additional limitations of the current

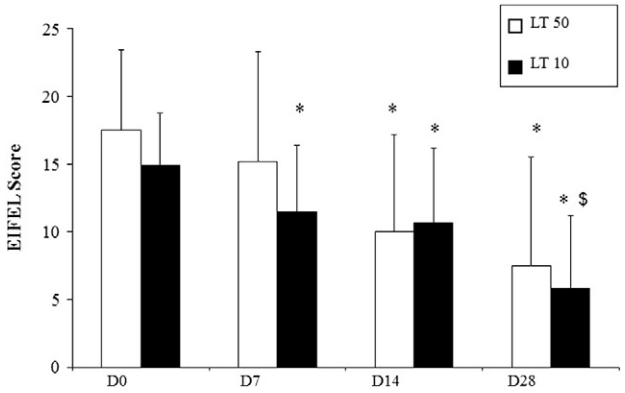

Fig 6. *Effect of lumbar tractions (LTs) corresponding to 50% of body weight (LT50 group; n = 8) and 10% of body weight (LT10 group; n = 9) on the score of EIFEL disability questionnaire at inclusion (day 0 [D0]), during treatment (day 7 [D7] and day 14 [D14]) and 14 days after the end of treatment (day 28 [D28]). P < .001: significantly different compared to D0.*

work are the limited number of subjects and lack of long-term patient follow-up. However, the study was designed to assess the short-term effect of a strong traction intervention in patients with acute leg pain of lumbar-sciatic origin. After 2 weeks of tractions, the pain was greatly reduced and remained at the lower level after 2 weeks of follow-up. We do not believe a longer follow-up would have changed the conclusion of the present investigation.

Conclusions

In this preliminary study, patients who received 2 weeks of LT reported reduced radicular pain from acute lumbar sciatica secondary to disc herniation, regardless of the traction force group to which they were assigned. The effect on radicular pain and disability were comparable after treatment with high-traction forces (50% BW) and low-traction forces (10% BW). Leg pain and functional impairment continued to be reduced 2 weeks after the traction intervention for both groups.

Funding Sources and Conflicts of Interest

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Contributorship Information

- Concept development (provided idea for the research): M.E.I.H., J.L., A.D.
- Design (planned the methods to generate the results): M.E.I.H., J.L., A.D.
- Supervision (provided oversight, responsible for organization and implementation, writing of the manuscript): M.E.I.H., J.L., P.V., A.D.
- Data collection/processing (responsible for experiments, patient management, organization, or reporting data): M.E.I.H., S.P.D., J.L., A.D.
- Analysis/interpretation (responsible for statistical analysis, evaluation, and presentation of the results): M.E.I.H., S.P.D., J.L., A.D., M.S., E.S.
- Literature search (performed the literature search): M.E.I.H., J.L., P.V., A.D.
- Writing (responsible for writing a substantive part of the manuscript): M.E.I.H., S.P.D., J.L., A.D.
- Critical review (revised manuscript for intellectual content, this does not relate to spelling and grammar checking): M.E.I.H., J.L., M.S.

Practical Applications

- This study reported that application of more traction force does not necessarily provide better benefit to patients with lumbar-sciatic leg pain.
- Patients' condition improved regardless of the traction force group to which they were assigned.

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