

Effect of Combined Traditional Acupuncture, Pharmacopuncture and Applied Kinesiology on Lumbar Diseases of Resident Patients

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Key Words

combined traditional acupuncture, pharmacopuncture, applied kinesiology treatments, lumbar diseases, Japanese Orthopedic Association, lumbar score.

Abstract

Objectives: Recently several Korean medical doctors have begun practicing applied kinesiology (AK). Although the efficacy of combining traditional acupuncture (TA) and pharmacopuncture (PP) on lumbar diseases such as lumbar spinal stenosis (LSS) and lumbar herniation of intervertebral disk (LHID) has been examined, the possible benefits of combining TA, PP and AK approaches have not been examined. Therefore the aim of this study was to develop effective treatment for lumbar disorders by combining TA, PP, and AK treatments.

Methods: Twenty-four patients hospitalized at Samse Korean Traditional Medicine Hospital between March and September 2018 with L5 or S1 root radiculopathy associated with LSS and LHID were included in this study. They were treated for 10 days with TA, PP and AK approaches that included category block, manipulation and strain/counterstrain treatments. The primary outcomes were mainly assessed using Japanese Orthopedic

Association lumbar scores (JOALS). JOALS were determined before the start of treatment as well as five and 10 days after treatment started.

Results: The treatments improved the lumbar condition of the patients based on JOA pain score.

Conclusion: The combined TA, PP and AK treatments were effective in treating spinal diseases of resident patients. Prospective, controlled, and relevant protocols using multimodal strategies to define the role of TA, PP and AK are needed.

1. Introduction

In traditional Korean medicine, TA and PP, are generally used to treat spinal diseases such as LSS and LHID [1-8], but the available evidence regarding the efficacy of acupuncture remains contradictory and controversial from a biomedical standpoint [9].

Spinal stenosis caused by degenerative development, and it can arise at different locations in the spinal canal. For example, central stenosis can cause bilateral leg pain, while lateral stenosis can cause more localized nerve root compression [10,11].

LHID [12,13] is the rupture or herniation of a lumbar intervertebral disc that causes back pain. It can be aggravated by motion which causes pain to radiate down the back of the leg, muscle weakness, decreased sensa-

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tion, and hyporeflexia of the leg and foot.

Therapies combining TA, PP, and AK techniques have not been reported even though Korean medical doctors are implementing AK treatments more frequently.

Typically pain scores are determined by JOALS [14], and many other methods [15-22] to quantify the pain associated with spinal diseases.

Therefore this study aimed to develop an effective treatment for lumbar diseases using a combination of TA, PP, and AK therapies and to aid future clinical protocols via JOALS measurement.

2. Materials and Methods

2.1. Design

This prospective study used TA, PP and AK treatments. It was performed in the Department of Acupuncture and Moxibustion, Samse Korean Traditional Medical Hospital, between March 1, 2018 and September 30, 2018.

2.2. Patients

Twenty-four resident patients were selected according to the inclusion and exclusion criteria. Patient history and baseline data were collected. Baseline data included age, sex, previous diagnosis, pain intensity of LBP using the visual analog scale (VAS) and JOA score.

2.2.1 Inclusion criteria

Patients with a VAS score of more than 3 or a JOA score of more than 5 were included regardless of any previous treatments they had received including acupuncture, nerve block, and/or medication.

2.2.2 Exclusion criteria

Patients with severe hip and knee joints' disorders or severe spondylolisthesis were excluded.

2.3. Acupuncture interventions

2.3.1 Traditional Acupuncture

Patients who were hospitalized underwent 20 sessions of acupuncture (2 sessions per day for 10 days). The acupuncture needles were 40 mm × 0.25 mm. Five acupoint (GB30, BL40, BL25, BL23, GB34) (23,24) which are said to be effective for LHID according to the "Korean Medicine Clinical Practice Guideline for Lumbar Herniated Intervertebral Disc in Adults" were chosen. Patients were needled at a depth of approximately 1 cm without any stimulation. BL23, BL25, GB30, BL40, and GB34 on the culprit side were needled first followed by BL25 and BL23 on the contralateral side. The retention time was 20 minutes.

2.3.2 Pharmacopuncture [25]

Pharmacopuncture is a new form of treatment that combines acupuncture and herbal medication. It is adminis-

tered at the acupoints without contacting the disinfected area. In this study, pharmacopuncture was performed with disposable Kovax-syringe (20 ml, 23G x 1"; Korea Vaccine, Ansan, Korea) and 6ccs of refrigerated Sweet BV pharmacopuncture solution prepared at Jaseng Herbal Dispensary which is an extramural facility.

2.3.2.1 Preparation of Sweet BV pharmacopuncture solution

Sweet BV pharmacopuncture solution was needled at GB30, BL40, BL25, BL23, and GB34 during the 20minute retention time that occurred once every day for 10 days of hospitalization.

2.4. AK intervention [26]

2.4.1. Pelvic Categories

The pelvic category system was developed by DeJarnette and is practiced when using the sacro occipital technique (SOT). The original system of evaluation and viable correction is the basis for additional diagnosis and therapeutic developments in applied kinesiology.

If the examination for pelvic faults is negative but symptoms indicate a probable fault, cervical motion may cause a positive fault finding. Anterior or lateral cervical flexion can increase dural tension to reveal the fault.

2.4.1.1. Category I

A category I pelvic fault will not have a positive challenge when only one sacroiliac is challenged. This is a differentiating factor between a category I and category II fault. To challenge only one sacroiliac, the sacrum is stabilized with one hand and the PSIS or ischium of one side is challenged. A strong indicator muscle is tested for weakness.

2.4.1.1.1. Block Adjusting Technique

DeJarnette blocks are placed under the prone patient's anterior superior iliac crest and acetabulum in a manner that relieves the pelvic torsion. Positive therapy localization with two hands placed over one sacroiliac can reveal a positive result or the compromised side of the category I fault. This technique does not allow for positive therapy localization with only one hand (Figure 1).



Figure 1 The first step in therapy localization for category I pelvic fault (with the permission of Deseong Medical Publication)

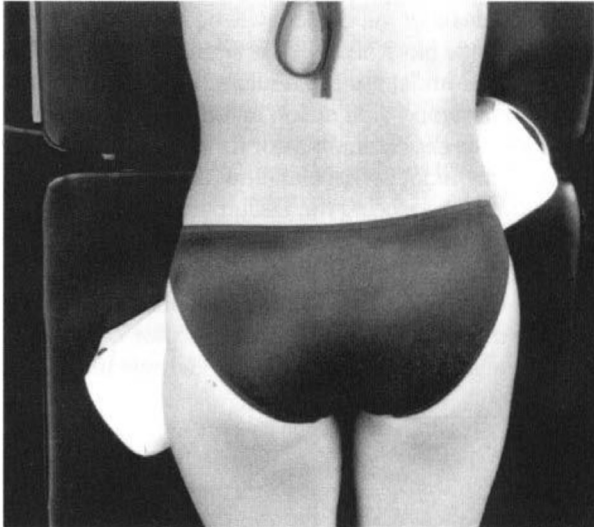


Figure 2 The second step in therapy localization for category I pelvic fault placing DeJarnette blocks (with the permission of Deseong Medical Publication) Blocks placement for category I left PI ilium and right posterior ischium. Blocks are placed under the anterior superior iliac spine and acetabulum and point toward each other.

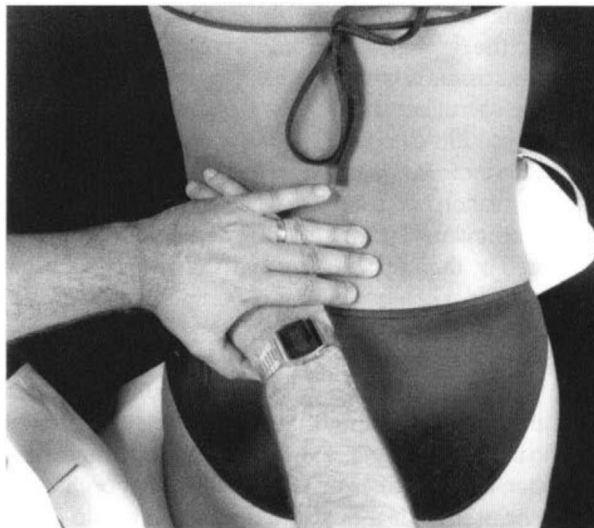


Figure 2 The second step in therapy localization for category I pelvic fault placing DeJarnette blocks (with the permission of Deseong Medical Publication) Blocks placement for category I left PI ilium and right posterior ischium. Blocks are placed under the anterior superior iliac spine and acetabulum and point toward each other.

2.4.1.2 Category II

A category IIsi pelvic fault is an osseous subluxation between the sacrum and the innominate. It is identified by positive therapy localization over the sacroiliac articulation. Therapy localization is usually performed with the patient supine, which yields a higher percentage of positive results than when performed in a prone position.

The posterior ilium is nearly always associated with dysfunction of the sartorius and/or gracilis muscles on the side of involvement. They give anterior support to the pelvis. Sometimes the muscles will not test weak initially, but a subclinical weakness may be found by therapy localizing the reflex points or other factors involved with the muscles. They may also test weak only in a weightbearing position.

The relationship of the muscle with the sacroiliac subluxation can be demonstrated by correcting the subluxation

2.4.1.2.1 Block Adjusting Technique

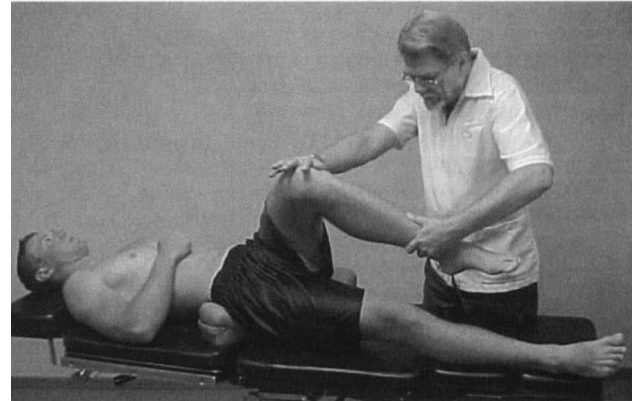


Figure 4 Leg movement associated with the supine block adjusting technique for Cat II (with the permission of Deseong Medical Publication)

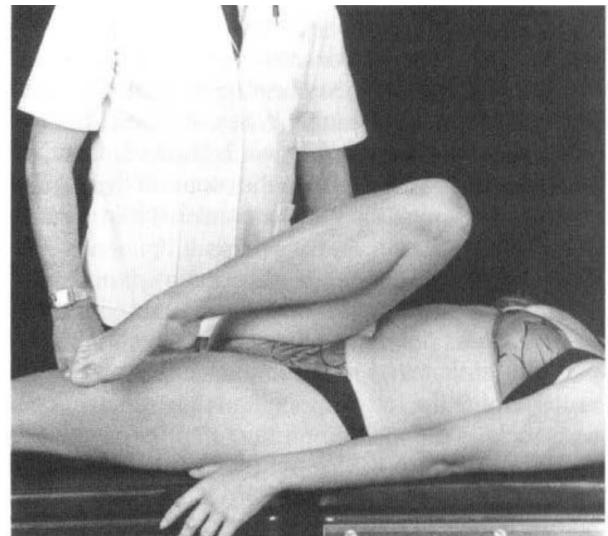


Figure 5 Maximal psoas contraction (with the permission of Deseong Medical Publication) The patient maximally contracts the psoas to test for weakening.

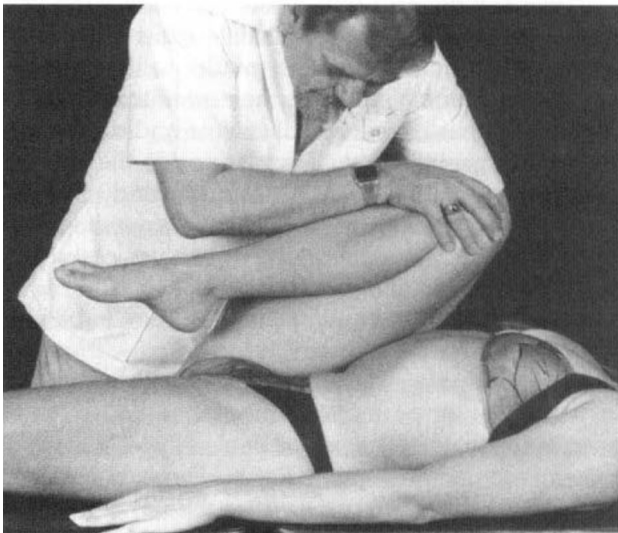


Figure 6 The maximal hip flexion and strain/counter strain technique (with the permission of Deseong Medical Publication) The hip and/or spine is flexed to shorten the psoas until the tenderness at the point is improved.

2.4.3 How to diagnose and treat Pelvic Categories and Strain/counter strain

2.4.3.1 Category I

Category I is diagnosed by conducting muscle tests through therapy localization. After challenge, DeJarnette blocks are placed under the prone patient's anterior superior iliac crest and acetabulum in a manner that relieves the pelvic torsion. Next, a pumping-type movement is performed on the side opposite of the positive side. Lastly, the muscle is retested to ascertain the results of the treatment.

2.4.3.2 Category II

Category II is diagnosed by conducting muscle tests through therapy localization. After challenge, DeJarnette blocks are placed under the posterior iliac spine (PSIS) on the posterior ilium side and under the ischium on the posterior ischium side so that they correct osseous subluxation between the sacrum and the innominate. Next, with the patient remaining on the blocks, their ankle and knee are grasped to move the leg on the posterior ischium side into flexion at the hip and knee. The thigh is adducted, bringing the knee across the body sufficiently to roll the patient gently onto the posterior ilium block. The knee and hip are then brought toward neutral, and the maneuver is repeated approximately six times in a rolling fashion. Lastly, the muscle is retested through therapy localization to ascertain the results of the treatment

2.4.3.3 Strain/counter strain [26]

The treatment devised by Jones and revised by Goodheart is carried out.

The patient maximally contracts their psoas to test for weakness. Next, the patient maximally flexes their hip to

shorten the psoas. This allows the practitioner to use their fingers to find the most painful point along the psoas muscle spindle. Lastly, the patient takes a deep breath and holds it while the practitioner spreads their fingers over the previously tender point. The patient is held in the fine-tuned position with the practitioner spreading the point while breathing normally for thirty seconds. Upon completion, the patient is slowly and passively returned to a neutral position. Once in the neutral position, the tender point in the psoas should be gone, and any associated pain such as lower back pain should be gone or greatly reduced. The psoas is retested after the patient has maximally contracted it for three seconds. There should now be no weakness if the treatment was successful.

2.5. Measurement tool

2.5.1 Visual Analogue Scale

The visual analogue scale (VAS) rates pain on a scale from zero (no pain) to 10 (most severe pain).

2.5.2 Japan Orthopaedic Association Lumbar Score (JOALS) [14, 27]

Table 1 Composition of the TA extract

Symptoms and signs	Evaluation		Score
I Subjective symptoms			
Lower back pain	None		3
	Occasional mild pain		2
	Occasional severe pain		1
	Continuous severe pain		0
Leg pain and/or tingling	None		3
	Occasional slight symptoms		2
	Occasional severe symptoms		1
	Occasional severe symptoms		0
Gait	Normal		3
	Able to walk farther than 500 m although it results in symptoms		2
	Unable to walk farther than 500 m		1
	Unable to walk farther than 100 m		0
II Clinical signs			
Straight-leg-raising test	Normal		2
	30-70°		1
	Less than 30°		0
Sensory disturbance	None		2
	Slight disturbance (not subjective)		1
	Marked disturbance		0
Motor disturbance	Normal		2
	Slight weakness (MMT 4)		1
	Marked weakness (MMT 3 to 0)		0
III Restriction of ADL	severe	moderate	none
Turn over while lying	0	1	2
Standing	0	1	2
Washing	0	1	2
Learning forwards	0	1	2
Sitting (about 1 hour)	0	1	2
Lifting or holding heavy objective	0	1	2
Walking	0	1	2
IV Urinary bladder function	Normal		0
	Mild dysuria		-3
	Severe dysuria		-6

The JOALS lumbar score considers four categories: subjective symptoms, clinical signs, restrictions of activities of daily living (ADL), and urinary bladder function. In this study, no patient had bladder dysfunction due to cauda equine disorder. The degree of lower back pain, leg pain and tingling, and gait varies from 3 (any signs) to zero (severe signs). Activities of daily living (ADL) varies from turning over while lying, standing, washing, leaning forwards, sitting, lifting, walking, and clinical signs such as SLR test, sensory disturbance, and motor disturbance.

2.6. Statistical analysis

Statistical analyses were conducted using SPSS version 21. Characteristics of the study patients were analyzed using means and standard deviations, but the combined treatments were analyzed using the paired t-test. Statistical significance was set at $p < 0.05$.

3. Results

3.1. Baseline data

Baseline data such as age, gender, onset, diagnosis, and severity of condition were collected on the first day of the study.

The average patient age was 59.96 ± 13.04 years, and 70.8% ($n = 17$) of the study population was female. Eighteen patients were diagnosed with LSS, and 6 were diagnosed with LHL. 66.7% ($n = 16$) of patients had a VAS score between 6 to 8.75% of patients were labeled as category I PI with SCS while 25% were labeled as category II PI with SCS (Table 2).

Table 2 Characteristics of the study patients

Variable	Study Population (n = 24)
Age (y)	59.96 ± 13.04
Sex	Female
	Male
Diagnosis	HNP
	Spinal stenosis
Severity of condition	Mild (Vas < 6)
	Moderate (Vas 6 ~ 8)
	Severe (Vas > 8)
Involving	A + P + C1PI + SCS
	A + P + C2PI + SCS

3.2. Variation in pain alleviation depending on lapse of treatment

3.2.1. Variations before intervention and after treatment for 5 days

The JOALS score was significantly improved after 5 days of combined treatments ($t = -5.37$, $p < .000$). The analysis also showed JOA score parameters such as subjective symptoms ($t = 2.29$, $p = .032$), clinical signs ($t = -1.00$, $p = 3.28$), and restriction of ADL ($t = -6.31$, $p < .000$) significantly improved (Table 2). Additionally, the VAS was significantly improved after 5 days of the combined treatments ($t = 2.63$, $p < .000$) (Table 3).

Table 3 Comparison of JOALS measurements before and after 5 days of combined acupuncture and AK treatments in patients with back pain

	Time				
	Before intervention	After 5 days	t	p	cl
JOALS	10.08 ± 4.88	11.83 ± 3.98	-5.37	.000	-2.42 -1.08
Subjective symptoms	2.75 ± 1.98	3.04 ± 1.80	-2.29	.032	-0.55 -0.03
Clinical signs	3.08 ± 1.28	3.12 ± 1.26	-1.00	.328	-0.13 0.04
ADL	4.25 ± 2.47	5.67 ± 2.01	-6.31	.000	-1.88 -0.95
VAS	7.25 ± 1.51	6.83 ± 1.76	2.63	.015	0.09 0.74

3.2.2. Variations before intervention and after 10 days after treatment

The JOALS scores improved significantly after 10 days of combined treatments ($t = -7.82$, $p < .000$). The analysis of the JOA scores showed that subjective symptoms ($t = -5.70$, $p < .000$), clinical signs ($t = -2.09$, $p < .000$), and restriction of ADL ($t = -6.42$, $p < .000$) were also significantly improved (Table 3). Additionally, the VAS score was significantly improved after 10 days of combined treatments ($t = -8.74$, $p < .000$) (Table 4).

Table 4 Comparison of JOALS scores before and after 10 days of acupuncture treatments in patients suffering from back pain

	Time				
	Before intervention	After 10 days	t	p	cl
JOALS	10.08 ± 4.88	15.71 ± 4.55	-7.82	.000	-7.11 -4.13
Subjective symptoms	2.75 ± 1.98	4.87 ± 1.65	-5.70	.000	-2.89 -1.35
Clinical signs	3.08 ± 1.28	3.46 ± 1.21	-2.09	.000	-0.74 -0.00
ADL	4.25 ± 2.47	7.37 ± 2.58	-6.42	.047	-4.13 -2.12
VAS	7.25 ± 1.51	4.92 ± 1.66	8.74	.000	8.74 2.90

4. Discussion

Lumbar spinal stenosis (LSS) is a narrowing of the disc spaces in the spine that puts pressure on the spinal cord and/or the nerve roots. It is one of the major causes of pain and numbness in the back and legs, and it is characterized by a lack of available space for the neural and vascular elements in the lumbar spinal canal. These changes lead to variable clinical syndromes such as intermittent claudication and back, gluteal, and lower extremity pain. All of these maladies are accompanied by limited daily function and impaired quality of life [10, 11, 28].

Lumbar herniation of intervertebral disk (LHID) or disc lesions are the most common cause of sciatica and lower back pain. Only in this century was it finally understood that most, if not all, cases of sciatica are caused by the herniation or rupture of intervertebral discs. Mixter and Barr published their cornerstone report linking ruptured discs, the spinal cord, and nerve root compression in 1977, long after their first publication in 1934, which is now regarded

as the classic description of a ruptured intervertebral disc. Intervertebral disc disorders and degeneration account for most LBP and sciatica, and 90% of all lumbar intervertebral discs show degeneration [11, 13, 29].

Degenerative changes around lumbar structures is the main cause of LSS and LHID. From the viewpoint of Oriental medicine, acupuncture can help remedy such degenerative changes by circulating the energy blockage. From the viewpoint of Western medicine, complementary and alternative medicine (CAM) can include acupuncture, pharmacopuncture, chiropractic manipulation, herbal medicine, magnet therapies, and vitamins. Particularly, pharmacopuncture [25] has become a state-of-the-art treatment for LSS and LHID in Korea because of its diverse clinical applications, fast results, synergic effects with acupuncture, usefulness against refractory diseases, and lenient treatment regulations. The efficacy of acupuncture is controversial even though it is widely practiced as a CAM treatment [30].

Robert [11] concluded that there are five treatment routes for LSS: drugs, stimulation analgesia, nerve block and injection, psychological techniques, and invasive implantation technologies. Although techniques such as transcutaneous electrical nerve stimulation or acupuncture are used frequently in pain clinics with regard to stimulation analgesia, they are of little benefit in LSS, except when specific radicular pain is accompanied by general backache.

Kim et al. [31] found no conclusive evidence that acupuncture is effective at treating LSS. However, Hiroyuki [32] concluded that acupuncture was significantly more effective than physical exercise according to the physical function score of the Zurich Claudication Questionnaire (ZCQ). It was also more effective than medication, according to the satisfaction score. They also assert that the study provides new important information that will aid decision making in LSS treatment. Mohammad et al. [33] reported that acupuncture had a significant short-term effect on pain and quality of life in LSS patients.

Most reviews that cover the efficacy of acupuncture on pain use the subjective VAS rating; thus, the pain evaluation could be variable. The JOALS, for lumbar disorders, was first adopted by the Japan Orthopedic Association in 1986, and recently, Nakamura et al. [34] suggested that the JOALS is reliable and valid after comparing it to the Japanese version of the Roland-Morris Disability Questionnaire. Also, Jung et al. [35] suggested that the Korean version of the JOALS was a reliable and valid instrument for assessing lower back pain.

In consideration of above-mentioned studies, JOALS was adopted for our study.

Different mechanisms have been used to determine the efficacy of acupuncture in spinal stenosis. Acupuncture may alleviate pain by inducing the release of endogenous opioids in the brain-stem and in the subcortical and limbic structures [36, 37]. Gabril et al. [38] concluded that acupuncture is an important tool in the treatment of chronic lower back pain, and Zongshi et al. [39] concluded that acupuncture can relieve the symptoms of sciatica by increasing a person's pain threshold, but evidence for its use in the nonoperative treatment for canal stenosis is lacking. In Korea, acupuncture treatments provided by traditional Korean medical doctors are covered by the national insur-

ance system.

AK is a system for evaluating body function by using muscle tests, and many doctors and dentists have been using AK treatments since 2000. The technique of muscle testing used by Goodheart (the inventor of AK in 1964) was developed by Kendall and Kendall. Most muscle tests done in AK have been called "muscle testing as functional neurology."

Techniques widely used in AK evaluation and treatment involve adjustment of the spinal column, manipulation of extraspinal articulations, nerve receptor treatment, balancing of the acupuncture meridians, treatment of the cranial-sacral primary respiratory system, and nutritional therapy. An AK evaluation should include a standard physical examination using orthopedic and neurologic tests, laboratory and X-ray tests when indicated, and a complete examination of the patient's medical history. When AK is used in conjunction with standard methods of diagnosis, it is easier to characterize and treat a patient's health problem.

There are many AK methods that can treat LSS and LHID. This study examined the efficacy of block and manipulation on Categories I and II pelvic faults and strain/counter strain on psoas when added to acupuncture and PP. We found that combined acupuncture and AK treatments were associated with decreased pain in patients with LSS and LHID, and the effect persisted two weeks after treatment. However, there were limitations to this study. First, we did not use a control group; therefore, it may be insufficient to assert that combined acupuncture and AK treatments are effective on LSS and LHID. Second, some patients may have spontaneously improved due to the passage of time, expectation, or other factors presented by Ali [38]. This study only followed patients for two weeks; thus, the long-term effects of acupuncture and AK combined treatments were not observed. Future trials using well-planned methodologies and appropriate comparisons should be used.

5. Conclusion

The combined TA, PP, and AK treatments were significantly effective on lumbar disorders such as LSS and LHID.

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Conflict of interest

I declare that I have no conflict of interest.

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