NSAIDS versus electro-acupuncture in management of low back pain in patients with lumbar spondylosis: a comparative cohort study

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Abstract

Background: Low back pain in lumbar spondylosis remains one of the most prevalent conditions, imposing a significant socio-economical burden. **Objectives**: To compare the effectiveness of low back pain treatment between NSAIDS and electro-acupuncture combined with infrared light (TCM) in patients with lumbar spondylosis. **Materials and methods**: We conducted a non-randomized prospective cohort study on lumbar spondylosis patients who had low back pain treated with either methods: NSAIDS or electro-acupuncture combined with infrared light therapy. **Results:** 75 patients were included, with a mean age of 53.39 ± 10.61 years. After 8 weeks of treatment, VAS scores decreased significantly from 7.5 ± 0.6 to 2.85 ± 0.4, p-value < 0.05 in NSAIDS group and from 5.8 ± 0.9 to 2.7 ± 0.6, p-value < 0.05 in TCM group. Schober index significantly increased over time (NSAIDS group from 10.36 ± 0.5 to 13.48 ± 0.7, TCM group from 10.88±0,8 to 13.61 ± 0.7, both with p-values < 0.05), whereas ODI score in both groups decreased (NSAIDS group from 37.4 ± 5.5 to 22.2 ± 5.5, TCM group from 28.68 ± 5.4 to 15.13 ± 6.4, with p-values < 0.05). The magnitude of improvement in VAS scores, Schober index, and ODI scores were more profound in NSAIDS group, with p-values < 0.05. Side effect associated with TCM treatment was seen in 8% of cases with pain at acupunture sites. Meanwhile in NSAIDS group, dyspepsia and flatulence were fairly common, at 24%. **Conclusions**: The use of NSAIDs in the management of low back pain in lumbar spondylosis patients is associated with better outcomes compared to TCM, with a trade-off for a higher risk of treatment-related side effects.

Keywords*: NSAIDS, electro-acupuncture, infrared light, low back pain, lumbar spondylosis.*

1. INTRODUCTION

Low back pain (LBP) is a prevalent condition with 80% of the population experiencing it at least once in their lifetime [1]. Despite the advancement in treatment methods, managing LBP remains a challenge to clinicians. In addition to pharmacological therapy, Traditional Chinese Medicine (TCM) using non-drug interventions is becoming more popular in the treatment of LBP. In particular, electro-acupuncture combined with infrared light is a simple and cost-effective procedure that has been used successfully at the grassroots level of healthcare [2]. Despite being commonly employed, the quantity and scope of research demonstrating the efficacy of this approach are still fairly small. According to contemporary medicine, in individuals with spinal degeneration, nonsteroidal anti-inflammatory drugs (NSAIDS) are crucial for reducing pain and improving motor function. However, prolonged usage of NSAIDS is unavoidable due to the nature of the persistent and recurrent pain associated with lumbar spondylosis. Therefore, more evidence is still needed on the effectiveness of NSAIDS in patients with long-term treatment. To further address this issue, we conducted this study with the following objectives:

1. To study the clinical characteristics of patients with low back pain due to lumbar spondylosis.

2. To compare the effectiveness of treating LBP between NSAIDS and electro-acupuncture combined with infrared light.

2. MATERIALS AND METHOD

2.1. Participants

We screened patients who aged from 18 to 70 years old, were diagnosed with lumbar spondylosis, and met the criteria according to the Guidelines for Diagnosis and Treatment of Musculoskeletal Diseases - Ministry of Health, 2014, as the following signs:

• Clinical manifestations include mechanically characterized spinal pain.

• X-rays of the lumbar spine typically reveal (straight - oblique - bilateral three-quarters view) such as bone spurs and narrowing of the joints between the vertebrae

Only those who had VAS index ≥ 5 and were not on any other concurrent pain management during

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the study period were included. All patients' consents were sought before the beginning of the study.

We excluded patients who were admitted to the hospital due to other acute conditions, cancer, or having systemic symptoms such as fever, weight loss, anemia. Patients with a history of spinal injury, spinal surgery, neuromuscular disorders, systemic diseases, pregnant or breastfeeding were also excluded.

2.2. Research methods

This study was conducted from January 2023 to July 2023 at the Internal Medicine clinic and Traditional Medicine clinic at Tinh Bien Town Medical Center, An Giang province.

Study design: Single-center, non-randomized, prospective cohort study.

Sample size: 75, calculated according to the estimating population proportions, convenience sampling.

Group assignment and treatment protocol: The choice of pain treatment (NSAIDs versus TCM) was left to the discretion of the participants. The research team made no effort to interfere with the participants' selection. In the NSAIDs group, the treatment protocol comprised oral Meloxicam 15 mg or Celecoxib 200 mg, administered once a day. In the TCM group, patients received a daily 40-minute session, consisting of 20 minutes of electro-acupuncture followed by 20 minutes of infrared light therapy. These sessions were administered five days per week and continued for a duration of 40 days. Electro-acupuncture points: Shen Du - BL23; Da Shang Shu - BL25; Huan Tiao - GB30; Wei Zhong - BL40; Shui Quan - K15; San Yin Jiao - SP6; EX -B2; Tian Ying Xue EX - UE7. Frequency 1- 3Hz; 5-10 Hz. Acupuncture Stimulator: Great Wall KWD 808 Electro Acupuncture Stimulator Machine KWD808i.

Data collection: We collected data of the patients in NSAIDS group at the Internal Medicine clinic, and of TCM group at the Tranditional Medicine clinic. Patients' pain levels were assessed in a self-reported manner, using the VAS scale. Additionally, patients underwent the Schober's test and completed the Oswestry low back pain disability questionnaire. All the measurements were performed at five different timepoints: at the beginning of treatment (VAS0, Schober0, ODI0), after 1 week, 2 weeks, 4 weeks, and 8 weeks of treatment.

2.3. Outcome measures

The primary outcomes were the improvement in pain indices, which were defined as the delta change of measured week from the baseline level.

- Pain level: Assessed based on pain intensity scale - VAS.

- Level of lumbar flexion: Assessed based on Schober index

- Level of function disability in activities of daily living in those suffering from low back pain (Oswestry Disability Index - ODI): Assessment based on Oswestry - a patient-completed questionnaire.

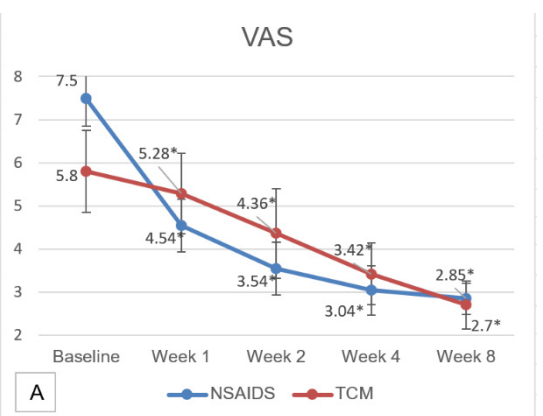
- Adverse effects appear during clinical trial.

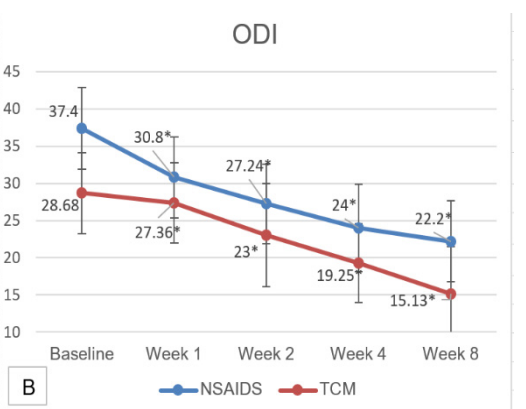
Statistical analysis: Unpaired t-tests were used for between-group comparisons, whereas paired t-tests were used with-in group comparisons (before-and-after treatment analyses). P-values below 0.05 were considered statistical significance.

3. RESULTS

Among 75 patients included in this study, women accounted for 53.3%. The average age was 53.39 ± 10.61 years, middle-aged group (40-59 years old) accounted for the highest proportion with 61.3%, the group aged 60 and over accounted for 29.3%, the group under 40 years old was at the lowest percentage with 9.33%. Three participants dropped out from the trial due to satisfaction with the result at the fourth week.

The clinical indicators (VAS, ODI, Schober index) of two treatment groups at baseline, 1, 2, 4 and 8 weeks are shown in Figure 1 and Table 1.





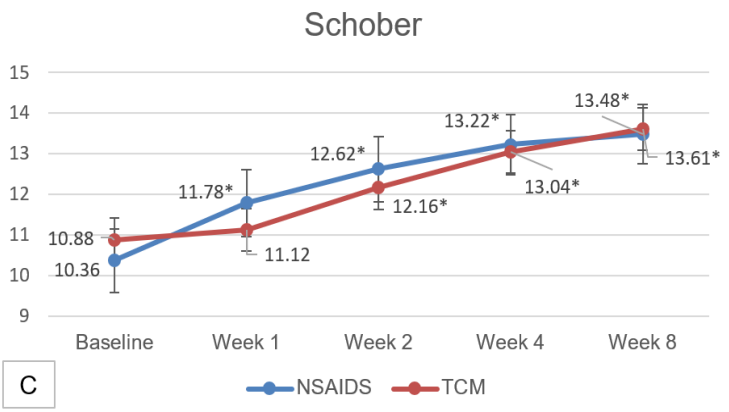


Figure 1. Changes in VAS score (A), ODI index (B), and Schober index (C) in treatment groups after 1, 2, 4 and 8 weeks. *: $p < 0.05$ with paired t-tests.

Compared to baseline, the pain level according to the VAS scale and the ODI index in both treatment groups decreased significantly, with $p < 0.05$. During an 8-week course of treatment, NSAIDS and TCM were effective in reducing pain and enhancing motor function. Regarding Schober index, with $p > 0.05$, the difference in Schober index when treated with TCM in week 1 was not statistically significant. As a result, TCM began to significantly increase Schober index in week 2 whereas NSAIDS continued to significantly enhance Schober index throughout the course of treatment (with $p < 0.05$).

Table 1. Improvement of clinical indicators in two groups during treatment compared to baseline.

		1 week (mean ± SD)	2 weeks (mean ± SD)	4 weeks (mean ± SD)	8 weeks (mean ± SD)
VAS	NSAIDS	2.96 ± 0.57	3.96 ± 0.88	4.46 ± 0.81	4.68 ± 0.76
	TCM	0.52 ± 0·71	1.44 ± 0.87	2.29 ± 1.23	3.04 ± 0.98
	p (t-test)	< 0.01	< 0.01	< 0.01	< 0.01
Schober	NSAIDS	1.42 ± 0.79	2.26 ± 0.83	2.86 ± 0.73	3.2 ± 0.79
	TCM	0.24 ± 0.6	1.28 ± 0.79	2.17 ± 0.82	2.74 ± 0.86
	p (t-test)	< 0.01	< 0.01	< 0.01	0.035
ODI	NSAIDS	6.60 ± 2.81	10.16 ± 3.4	13,4 ± 3,84	15.65 ± 3.68
	TCM	1.32 ± 1.82	5.68 ± 3.19	9,04 ± 2,56	13.26 ± 4.43
	p (t-test)	< 0.01	< 0.01	<0,01	0.025

According to the VAS scale, ODI and Schober index, there were differences in effectiveness between the patient groups treated with NSAIDS and TCM, with $p < 0.05$, they were statistically significant. During the treatment period from week 1 to week 8, the NSAIDS treatment was more effective in reducing pain, improving activities of daily living and lumbar flexion than the TCM treatment.

Table 2. Adverse effects and their incidences during treatment

		Week 1		Week 2		Week 4		Week 8	
		n	%	n	%	n	%	n	%
NSAIDS	Dyspepsia, flatulence	0	0	2	4	12	24	3	6
	Epigastric pain	0	0	0	0	4	8	1	2
	Nausea	0	0	0	0	4	8	1	2
TCM	Pain	2	8	2	8	0	0	0	0

Pain in the acupuncture area, which appeared within the first two weeks of therapy and accounted for 8%, was the only one associated with traditional medicine. Meanwhile, the side effects of using NSAIDS

began to manifest in week 2 and peaked in week 4, with dyspepsia and flatulence accounting for the greatest proportion at 24%.

4. DISCUSSION

The average age of the study subjects is 53.39 ± 10.61 years. This result is consistent with the pathophysiology of lumbar spine degeneration - a chronic condition common in middle-aged and elderly people. The natural aging process, as well as living and working practices, are causes of back pain brought on by lumbar spine degeneration. Our research results are similar to Vinh Quoc N.'s study [3] when the author noted the average age was 56.25 ± 8.87 years old. Compared with similar studies around the world, Albrecht F.'s study [4] recorded an average age of 50 ± 7 years. This similarity demonstrates that there are no appreciable differences in the proportion of individuals with low back pain from lumbar spondylosis distributed by age across domestic and foreign studies. Women made up 53.3% of the total patients who took part in the trial. This ratio can be explained by a number of factors, including the fact that low estrogen levels after menopause make it harder for women to absorb calcium and that insufficient exercise and physical activity habits make it harder to absorb vitamin D. The research's findings on age group distribution indicate that the group between 40 and 59 years old accounts for the biggest share (61.3%), followed by the group 60 and over (29.5%), and the group under 40 years old (9.33%). This outcome can be compared to Vinh Quoc N.'s study [3], which found that the age range of 40 to 59 had the highest proportion with 77.5%. The group under 40 years old stands apart from other age groups in that the rate is only 2.5 percent, according to author Vinh Quoc N. The increase in the percentage of those under 40 in our study shows the degenerative lumbar spine condition rejuvenation trend brought on by changes in the nature of job, inactivity, poor posture, and inadequate nutrition.

Patients using Traditional Medicine began treatment with lower pain levels than those opting for NSAIDs, likely due to preferences for modern medicine, such as NSAIDs, for acute pain, while traditional medicine is chosen for persistent pain. This aligns with the distinct pain-relief methods of NSAIDs and traditional therapies like electro-acupuncture with infrared light. Similarly, those with severe, life-disrupting pain tend to choose NSAIDs for quick relief, whereas traditional medicine users endure ongoing pain, offering a more accurate evaluation of back pain's impact on daily life.

Compared with the study of author Duong Trong Nghia [5], a stable decrease in the VAS index was recorded when patients with low back pain were treated with electroacupuncture combined with infrared light. The patient's VAS score dropped from 6.32 to 2.4 at the end of treatment. Similarly, To Van Dut's research [6] from 2022 showed that the VAS index dropped from 7.1 to 4.2 after 15 days of treatment, which was statistically significant. Regarding the effectiveness of NSAIDS treatment, according to the findings of a meta-analysis study by Baroncini A [7], which showed a reduction from 6.9 to 2.0 following therapy (17.7 ± 24.9 days).

During treatment, Schober index gradually grew in both groups. Particularly, TCM is effective from week 2 onwards in improving Schober index, while NSAIDS is effective in doing so throughout the course of treatment. This outcome is consistent with several research on the efficacy of electro-acupuncture when combined with other techniques to treat low back pain such as Phan Quan Chi Hieu's [8] research on electro-acupuncture combined with lumbar spine traction or To Van Dut's research [6] combining electro-acupuncture and Chinese Yangsheng. However, studies conducted all around the world with greater sample numbers have produced contradictory findings. Albrecht and colleagues [4] conducted a study on the effectiveness of acupuncture on 186 patients with low back pain. Acupuncture alone improved pain severity according to the VAS scale and there was no difference in Schober index before and after treatment. This difference requires more large-scale studies to clarify the effectiveness of electro-acupuncture in improving lumbar spine extension.

Both treatments were effective in improving function disability in activities of daily living over the course of 8 weeks of treatment. The improvement in daily functional activities has been recorded in many similar studies, typically the research results of Nguyen Thi Tu Anh [9] recorded a clear improvement after 15 days of electro-acupuncture treatment, from below average level to good-very good level. In addition, Vu Thai Son's research [10] in 2018 recorded a statistically significant improvement, from poor to above average after 7 days of treatment. Regarding the effectiveness of NSAIDS in improving quality of life, there are many scales used such as Quebec, SF-36, Roland-Morris (RMDQ) to evaluate. According to Baroncini A [7], NSAIDS are

effective in improving the quality of life of low back pain patients with a statistically significant change in RMDQ score. Adverse effects of electroacupuncture only appear in the first 2 weeks of treatment. This could be attributed to the patient's lack of electro-acupuncture adaptation. This explanation, which is also a frequent adverse effect of treatment, is compatible with the mechanism of action. Our study identified gastrointestinal adverse effects of NSAIDS, with the following symptoms: dyspepsia, flatulence, stomach aches and nausea. A decline in occurrences was noted between the fourth and eighth weeks. Plausible factors contributing to the reduction in adverse effects associated with NSAIDs during this period include the following:

- Proton pump inhibitors (PPIs), prescribed to diminish stomach acid levels and mitigate the potential for ulcers or bleeding, observed in four participants.

- Adjustments in NSAID dosage, involving the switch to an alternative NSAID or modification of dosage to alleviate gastrointestinal symptoms, reported in two participants.

- Additionally, three trial participants withdrew by the fourth week, potentially due to experiencing adverse effects despite being content with the treatment's outcomes.

All of these signs have been mentioned in the majority of medical literature. According to previous studies, 2 - 4% of long-term NSAIDS users will experience gastrointestinal problems, including bleeding or perforation [11]. Nonetheless, the sample size of this study was so small that safety should be carefully considered for future large-scale trials.

5. CONCLUSION

In patients with low back pain caused by lumbar spondylosis, NSAIDS is more effective than electro-acupuncture in combination with infrared light in terms of pain relief, lumbar flexion and improvement of functional activities. However, NSAIDS are more likely to result in adverse effects, most frequently gastrointestinal ones.

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