

Original Article

Effects of acupuncture-moxibustion at Du channel combined with triamcinolone acetonide on clinical treatment efficacy and quality of life in patients with sciatica

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Received August 6, 2020; Accepted September 16, 2020; Epub December 15, 2020; Published December 30, 2020

Abstract: Objective: To investigate the effects of acupuncture-moxibustion at Du channel combined with triamcinolone acetonide (AMDCTA) on the clinical treatment efficacy and quality of life in patients with sciatica. Methods: A retrospective study was conducted on 86 patients with sciatica admitted to Tianjin Hospital from March 2018 to April 2020. According to different treatment methods, the patients were divided into an observation group (45 cases) and a control group (41 cases). The control group was treated with triamcinolone acetonide, while the observation group was treated with AMDCTA, both lasted for 3 weeks. Clinical treatment efficacy, visual analogue scale score, straight leg raising score, Oswestry dysfunction index score, 36-item short-form health survey quality of life score, serum insulin-like growth factor-1 (IGF-1) level, tumor necrosis factor- α (TNF- α) level, monocyte chemoattractant protein-1 (MCP-1) level, and the incidence of adverse reactions in both groups were compared. Results: The total effective rate of the observation group was significantly higher compared with that of the control group ($P < 0.05$). Visual analogue scale and Oswestry dysfunction index scores in both groups were significantly lower compared with those before treatment, and the scores of the observation group were significantly lower compared with the control group after treatment (all $P < 0.05$). Straight leg raising and 36-item short-form health survey quality of life scores in both groups were significantly improved compared with those before treatment, and those in the observation group were significantly higher compared with the control group after treatment (all $P < 0.05$). IGF-1, TNF- α and MCP-1 levels in both groups were significantly lower compared with those before treatment, and those levels in the observation group were lower compared with those in the control group after treatment (all $P < 0.05$). There was no significant difference in the incidence of adverse reactions between the two groups ($P > 0.05$). Conclusion: AMDCTA had a definite curative effect on sciatica, could effectively improve patients' pain, functional activity and quality of life, as well as reduce IGF-1, TNF- α and MCP-1 levels; revealing it is safe and reliable.

Keywords: Sciatica, triamcinolone acetonide, acupuncture-moxibustion at Du channel, quality of life, dysfunction

Introduction

Sciatica is a syndrome characterized by pain in the sciatic nerve distribution area and nerve pathways, and at present, most sciatica is secondary and caused by structural lesions around the sciatic nerve and local nerve stimulation and compression [1]. At the onset, the patient may experience slight pain, numbness, or burning in the buttocks, thighs, and back of the lower legs; when the condition worsens, it may cause dyskinesia such as walking difficulty

[2, 3]. Western medicine has no specific regimen for the treatment of sciatica, and it mainly alleviates clinical symptoms. Triamcinolone acetonide is commonly used in clinical treatment of chronic lumbocrural pain, joint pain, and scapulohumeral peri-arthritis, it has certain vasoconstrictive and anti-inflammatory effects, however, long-term use will affect the metabolism due to the fact that it belongs to hormone drugs [4, 5]. According to traditional Chinese medicine (TCM), sciatica belongs to the category of "lumbocrural pain" and "arthral-

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Table 1. Comparison of general information (x ± sd, %)

Group	Gender (male/female)	Age (year)	Course of disease (year)	BMI (kg/m ²)
Control group (n = 41)	26/15	48.8±4.7	4.5±0.7	22.51±3.96
Observation group (n = 45)	28/17	48.2±4.3	4.4±0.6	21.62±3.21
t/χ ²	χ ² = 0.013	t = 0.618	t = 0.713	t = 1.149
P	0.909	0.538	0.478	0.254

Note: BMI: body mass index.

gia syndrome”, and the external causes are mostly caused by the invasion of wind, cold and dampness, such as living in a wetland for a long time, catching a cold in the rain, or sweating when working in the wind, wearing clothing that were cold and wet; or in the long summer season, when the heat and humidity cross, eventually making the “six evils” such as damp-heat, cold-dampness, and summer-heat invade the waist, blocking the circulation of Qi and blood in the waist and legs, thus causing pain [6, 7]. The internal causes are mostly caused by kidney deficiency, such as old age or deficiency caused by long illness, leading to the loss of nourishment of the muscles, bones and veins of the waist, and if the muscles and veins are blocked, it will hurt, thus causing pain and discomfort in the waist and legs [8, 9]. Therefore, the treatment should be closely related to wind, cold, dampness, heat, and deficiency of kidney Qi. On the basis of Western medicine treatment, this study adopted TCM of acupuncture-moxibustion at Du channel to analyze the therapeutic effect of the combination of Chinese and Western medicine in the treatment of sciatica.

Materials and methods

General information

A retrospective study was conducted on 86 patients with sciatica admitted to Tianjin Hospital from March 2018 to April 2020. According to different treatment methods, the patients were divided into an observation group (45 cases) and a control group (41 cases). The differences between the two groups were balanced and the data were comparable. See **Table 1**. This study was approved by the Ethics Committee of Tianjin Hospital. All patients signed the informed consent.

Inclusion and exclusion criteria

Inclusion criteria: (1) In Western medicine, patients who met the diagnostic criteria of sciatica in *Practice of Surgery*, that was caused by

lumbar disc herniation. There were obvious tenderness points at the lumbar spinous processes, buttock and iliac point. The sensory function, motor function and nerve reflex of sciatic innervation were weakened, such as the skin sensation on the outside of the lower leg and the Achilles tendon reflex [10]. (2) Patients diagnosed by CT or MRI auxiliary examination. (3) In TCM, patients who conformed to the cold dampness type in *Guiding Principles of Clinical Research on New Drugs of Traditional Chinese Medicine*, which the main symptoms were pain in the gluteal iliac region, lumbosacral region and popliteal fossa, cool limbs, inconvenience in turn over, and no reduction in resting pain; the secondary symptoms were limited activity, like warm better than cold, with heavy cold pain; the tongue vein was light tongue, white or greasy fur, and slow or slow pulse [11]. (4) Patients who were suitable for conservative treatment. (5) Patients who voluntarily signed the informed consent.

Exclusion criteria: (1) Patients who had undergone surgical treatment. (2) Patients with physical disabilities. (3) Patients with abnormal mental consciousness. (4) Patients who could not understand the scale and could not cooperate with treatment and examination. (5) Patients complicated with other neuropathy. (6) Patients who fainted during acupuncture. (7) Patients with lumbar tumors. (8) Patients with heart, liver, lung and kidney insufficiency.

Treatment methods

The control group was treated with triamcinolone acetonide (National Drug Approval H53021605, Kunming Jida Pharmaceutical Co., Ltd., specification: 2 mL). Either intramuscular injection was given, 20-100 mg/time, once a week, or joint cavity injection or subcutaneous injection was given, 2.5-5 mg/time, once a week.

The observation group was treated with acupuncture-moxibustion at Du channel in addition to treatment of the control group. Selection

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of acupoints: Changqiang (at the midpoint of the connection between the end of the coccyx and the anus), Yaoyu (on the posterior median line of lumbosacral part, suitable for sacral hiatus), Yaoyangguan (in the depression of the fourth lumbar spinous process), Mingmen (in the depression of the second lumbar spinous process), and Xuanshu (in the depression of the first lumbar spinous process). Acupuncture was performed using the Huatuo brand No. 28 1.5-inch acupuncture needles (purchased from Suzhou Medical Supplies Factory). The acupuncture depth was 10 inches. After the needle was inserted, the corresponding acupoints were punctured by lifting and inserting or twirling, and the needle was retained for 25 min, once every other day. Patients in both groups were treated continuously for 3 weeks.

Outcome measures

(1) According to *Expert Consensus on Diagnosis and Treatment of Neuropathic Pain*, the patients' clinical efficacy after 3 weeks of treatment was evaluated. The clinical symptoms and signs such as tenderness points, sensations and nerve reflex basically disappeared, the straight leg raising (SLR) showed negative, life was basically unaffected, and could perform activities freely was scored as markedly effective. The above clinical symptoms and signs were significantly improved, the SLR was negative, and the activity level was slightly affected was scored as effective. If the above clinical symptoms and signs were not significantly improved, the SLR was positive, and life was still affected, such as obvious pain in climbing stairs, it was scored as ineffective. Total effective rate = (markedly effective + effective)/total number * 100% [12].

(2) Visual analogue scale (VAS) was used to evaluate the pain before and after 3 weeks of treatment. A score of 0 indicated no pain; a score of 1-3 indicated mild pain, which was acceptable to the patient; a score of 4-6 indicated severe pain, which affected the patients' sleep; a score of 7-10 indicated unbearable pain, which seriously affected the patients' sleep [13].

(3) SLR before and after 3 weeks of treatment: In the supine position, the lower limbs were straightened. The examiner straightened the

knee joint with one hand and raised the ankle with the other hand until the patient's lower limb had radiation pain. The angle between the bed surface and the lower limbs was recorded [14].

(4) Oswestry dysfunction index (ODI) was used to evaluate the dysfunction before and after 3 weeks of treatment, including ten items such as pain, standing, sitting, walking, lifting, sleep, sexual life, self-care, social life, and tourism. The 0-6 grading method (0-60 scores) was adopted. The lower the score, the better the patient's lumbar function [15].

(5) The 36-item short-form health survey (SF-36) was used to evaluate the patients' quality of life before and after 3 weeks of treatment (telephone and WeChat follow-up). The scale included 36 items from 8 dimensions, namely emotional function, physical pain, physical health, role function, social function, mental health, energy and overall health. The score was 0-100, the higher the score, the higher the quality of life [16].

(6) Serum factor levels were detected before and after 3 weeks of treatment. First, 4 mL of fasting venous blood was collected from the patient, after coagulation, the blood was centrifuged at a radius of 13.5 cm at 3,000 r/min for about 5 min. The serum was separated and placed in an anticoagulant tube. Tumor necrosis factor- α (TNF- α), serum insulin-like growth factor-1 (IGF-1), and monocyte chemoattractant protein-1 (MCP-1) levels were determined by enzyme-linked immunosorbent assay with Beckman IAMMGE. The kits were purchased from Wuhan Boshide Biotechnology Co., Ltd, China.

(7) The incidence of adverse reactions including hypertension, hypokalemia and edema were recorded. Total adverse reaction incidence = number of all adverse reactions/total number of cases * 100%.

Statistical analysis

SPSS 23.0 software was used for data processing. The measurement data in accordance with the normal distribution were expressed as mean \pm standard deviation ($\bar{x} \pm s$) and compared using t test. The enumeration data were expressed as percentage and com-

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Table 2. Comparison of clinical efficacy (n, %)

Group	Markedly effective	Effective	Ineffective	Total effective rate
Control group (n = 41)	12 (29.27)	19 (46.34)	9 (21.95)	32 (78.05)
Observation group (n = 45)	26 (57.78)	16 (35.56)	3 (6.67)	42 (93.33)
Z/ χ^2	Z = 2.823			$\chi^2 = 4.174$
P	0.005			0.041

Table 3. Comparison of VAS, SLR and ODI scores ($x \pm sd$)

Group	VAS (score)		SLR ($^\circ$)		ODI (score)	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Control group (n = 41)	7.34 \pm 1.22	4.76 \pm 0.98***	43.21 \pm 4.43	59.39 \pm 6.56***	46.41 \pm 4.69	28.02 \pm 3.30***
Observation group (n = 45)	7.68 \pm 1.48	3.54 \pm 0.52***	42.21 \pm 4.05	67.24 \pm 7.63***	45.02 \pm 4.50	20.50 \pm 2.41***
t	1.156	7.301	1.094	5.092	1.402	12.143
P	0.251	< 0.001	0.277	< 0.001	0.165	< 0.001

Note: Compared within the same group before treatment, ***P < 0.001. VAS: visual analogue scale; SLR: straight leg raising; ODI: Oswestry dysfunction index.

pared using χ^2 test. Rank sum test was used for rank data. P < 0.05 was considered statistically significant.

Results

Comparison of general information

There was no significant difference in terms of gender, age, course of disease and body mass index between the two groups (P > 0.05). See **Table 1**.

Comparison of clinical efficacy

The clinical efficacy of the observation group was significantly higher compared with that of the control group (P < 0.05), suggesting that acupuncture-moxibustion at Du channel combined with triamcinolone acetonide (AMDCTA) can effectively improve the clinical treatment efficacy of patients with sciatica. See **Table 2**.

Comparison of VAS, SLR and ODI scores

Before treatment, there were no significant differences in VAS, SLR and ODI scores between the two groups (P > 0.05). After treatment, VAS and ODI scores of the two groups were significantly lower compared with those before treatment, while SLR score was significantly higher compared with that before treatment, and the improvement of the observation group was better (P < 0.001). This suggested that AMDCTA could effectively improve

VAS, SLR and ODI scores of patients with sciatica. See **Table 3** and **Figure 1**.

Comparison of SF-36 score

Before treatment, there was no significant difference in SF-36 score between the two groups (P > 0.05). After treatment, SF-36 scores in both groups were significantly increased compared with those before treatment, but the improvement was better in observation group (P < 0.01). This suggested that AMDCTA could effectively improve the quality of life in patients with sciatica. See **Table 4**.

Comparison of serum factor levels

Before treatment, there was no significant difference in serum factor levels between the two groups (P > 0.05). After treatment, the serum levels of TNF- α , IGF-1 and MCP-1 in both groups were significantly lower compared with those before treatment, but the improvement in the observation group was better (P < 0.001). This suggested that AMDCTA could effectively reduce the serum levels of TNF- α , IGF-1 and MCP-1 in patients with sciatica. See **Table 5** and **Figure 2**.

Comparison of adverse reactions

There was no significant difference in adverse reactions between the two groups (P > 0.05). This suggested that AMDCTA would not increa-

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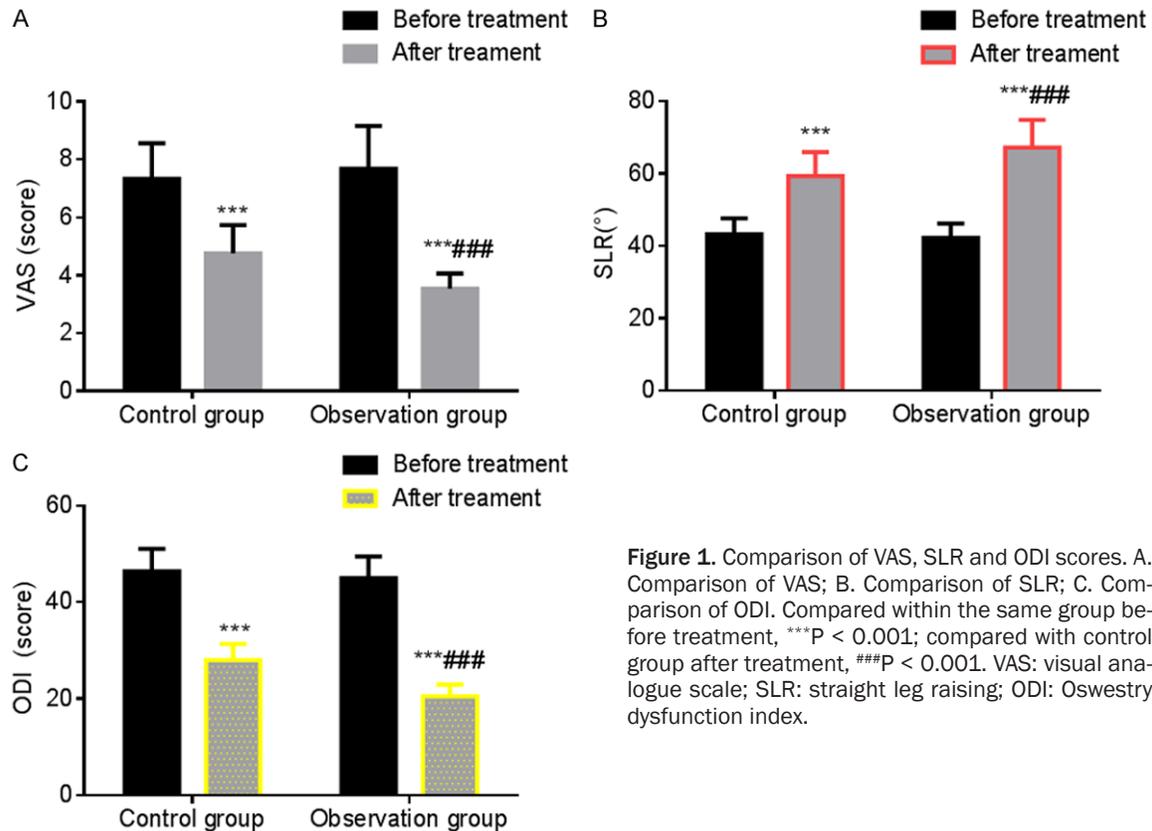


Figure 1. Comparison of VAS, SLR and ODI scores. A. Comparison of VAS; B. Comparison of SLR; C. Comparison of ODI. Compared within the same group before treatment, ***P < 0.001; compared with control group after treatment, ###P < 0.001. VAS: visual analogue scale; SLR: straight leg raising; ODI: Oswestry dysfunction index.

se the incidence of adverse reactions in patients with sciatica. See **Table 6**.

Discussion

Sciatica is mostly caused by lumbar disc herniation, and patients with mild disabilities caused by sciatica account for about 60% of all cases, and most are manual workers [17]. According to the etiology of sciatica, it is divided into primary and secondary. Primary sciatica is mostly caused by infection such as gingiva and tonsil, with a low incidence [18]. Most patients belong to secondary sciatica, mainly due to the compression and stimulation around the sciatic nerve, resulting in local tissue structure lesions [19]. At present, the pathogenesis of sciatica tends to create a neuroinflammatory response, mechanical tissue compression, and psychosocial factors, and the treatment is mainly based on drugs and surgery, with the main principle being to relieve patients' clinical symptoms and eliminate pain [20]. Triamcinolone acetonide, which belongs to adrenocortical hormones, has strong and lasting anti-inflammatory and anal-

gesic effects. It can reduce the permeability of capillaries, relieve hyperemia, inhibit the migration of inflammatory cells and prevent inflammatory reactions. In addition, it can also inhibit macrophage phagocytosis, reduce the function of reticuloendothelium system to eliminate cells, which has an obvious effect on T lymphocytes, and then reduce the level of autoimmune antibodies, which also has a certain effect on metabolism, and can enhance the function of calcium, phosphorus and potassium excretion and sodium ion reabsorption [21, 22]. Triamcinolone acetonide is commonly used in the treatment of lumbocrural pain, and has significant curative effect in a short period of time. This study showed that after treatment, the pain level and serum factors such as TNF- α , IGF-1 and MCP-1 levels of the control group were significantly improved, which further illustrated the role of triamcinolone acetonide as an anti-inflammatory and analgesic agent. However, as triamcinolone acetonide is a hormone drug, it is not suitable for long-term use due to its large side effects, or it may cause complications such as hypertension, obesity, hypokalemia and edema [23].

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Table 4. Comparison of SF-36 score ($\bar{x} \pm s.d.$, score)

Items	Control group (n = 41)	Observation group (n = 45)	t	P
Emotional role function				
Before treatment	51.95±5.12	52.17±5.09	0.120	0.842
After treatment	71.45±7.46***	80.45±8.21***	5.302	< 0.001
Physical pain				
Before treatment	71.75±7.47	71.06±7.38	0.243	0.808
After treatment	76.68±8.66***	86.14±8.84***	5.005	< 0.001
Physical health				
Before treatment	65.79±6.56	64.53±6.47	0.896	0.373
After treatment	74.17±7.67***	81.87±8.28***	4.461	< 0.001
Role function				
Before treatment	62.45±6.63	62.34±6.76	0.076	0.940
After treatment	74.21±7.33***	81.54±8.21***	4.351	< 0.001
Social function				
Before treatment	54.34±5.53	53.77±5.51	0.478	0.634
After treatment	72.36±7.51***	81.65±8.30***	5.424	< 0.001
Mental health				
Before treatment	70.59±7.18	69.06±7.08	0.994	0.323
After treatment	80.84±8.19***	86.37±8.45***	3.076	0.003
Energy				
Before treatment	53.48±5.56	52.32±5.71	0.148	0.883
After treatment	76.41±7.24***	83.53±8.76***	4.086	< 0.001
Overall health				
Before treatment	52.59±5.47	51.44±5.36	0.984	0.328
After treatment	73.49±7.14***	82.33±8.19***	5.312	< 0.001

Note: Compared within the same group before treatment, ***P < 0.001.

TCM has incomparable advantages in this respect. Based on the theory of Yin-Yang and five elements, TCM analyzes the etiology, disease type and viscera meridians through “look, listen, question and feel the pulse”, summarizes syndrome types, and treats the disease based on syndrome differentiation, dredges viscera and meridians, maintains the circulation of Qi and blood, and connects inside and outside, so as to achieve good therapeutic effect [24]. Acupuncture and moxibustion uses acupuncture techniques to stimulate specific sites, so as to achieve the purpose of treating diseases. There is no drug absorption process and it is safer than Western medicine. According to TCM, sciatica is mainly caused by the invasion of wind, cold and dampness after liver and kidney deficiency. The internal causes are liver and kidney deficiency, dystrophy of muscles and bones, insufficient anti-pathogenic energy, wind-cold and dampness-heat invades the waist meridians,

thus affecting the lumbar blood circulation, resulting in Qi and blood block, and venous stagnation. The external causes are when the lumbar vertebra suffers cold-dampness invasion for a long time, or bad sitting posture, or physical fatigue, which causes strain and atrophy of the lumbar muscle group. Internal and external causes inclusion causes muscle and bone weakness, thus resulting in sciatica [25]. Therefore, the treatment should be based on warming the meridians to relieve pain, tonifying the liver and kidney, dredging the meridians and activating blood circulation to remove blood stasis. This study showed that after treatment, compared with control group, the clinical efficacy was better, the pain was less, the SLR was greater, the serum levels were lower, and the improvement of lumbar function was better in the observation group. It suggested that the combination of traditional Chinese

and Western medicine had positive significance for the prognosis of patients. Acupuncture and moxibustion dredge the acupoints to activate meridians, activate blood circulation and remove blood stasis, relieve pain and improve microcirculation. Compared with Western medicine alone, acupuncture combined with moxibustion is more effective. Because of the inseparable relationship between meridians and acupoints, it is the most basic condition for connecting the body as a whole, constituting and maintaining neural activities. Acupoint stimulation can make the body's Qi and blood circulate, connect inside and outside, nourish the whole body, and provide a suitable internal environment for the health preservation of bones and muscles [26]. The Du channel starts from the lower abdomen, around the back reaches the inside of spine, and the upper portion reaches into the brain of Fengfu behind the neck, and the portion lower reaches the perineum. There are 28 acupoints

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Table 5. Comparison of serum factor levels (x ± sd)

Group	TNF-α (μg/mL)		IGF-1 (ng/mL)		MCP-1 (pg/mL)	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Control group (n = 41)	17.47±4.36	11.98±3.74***	280.68±29.78	59.19±5.68***	152.41±16.39	46.02±0.30***
Observation group (n = 45)	17.50±4.31	8.36±3.04***	277.34±27.02	51.74±5.41***	150.42±16.40	37.50±0.21***
t	1.392	7.382	0.836	5.089	0.125	9.940
P	0.167	< 0.001	0.405	< 0.001	0.901	< 0.001

Note: Compared within the same group before treatment, ***P < 0.001. TNF-α: tumor necrosis factor-α; IGF-1: serum insulin-like growth factor-1; MCP-1: monocyte chemoattractant protein-1.

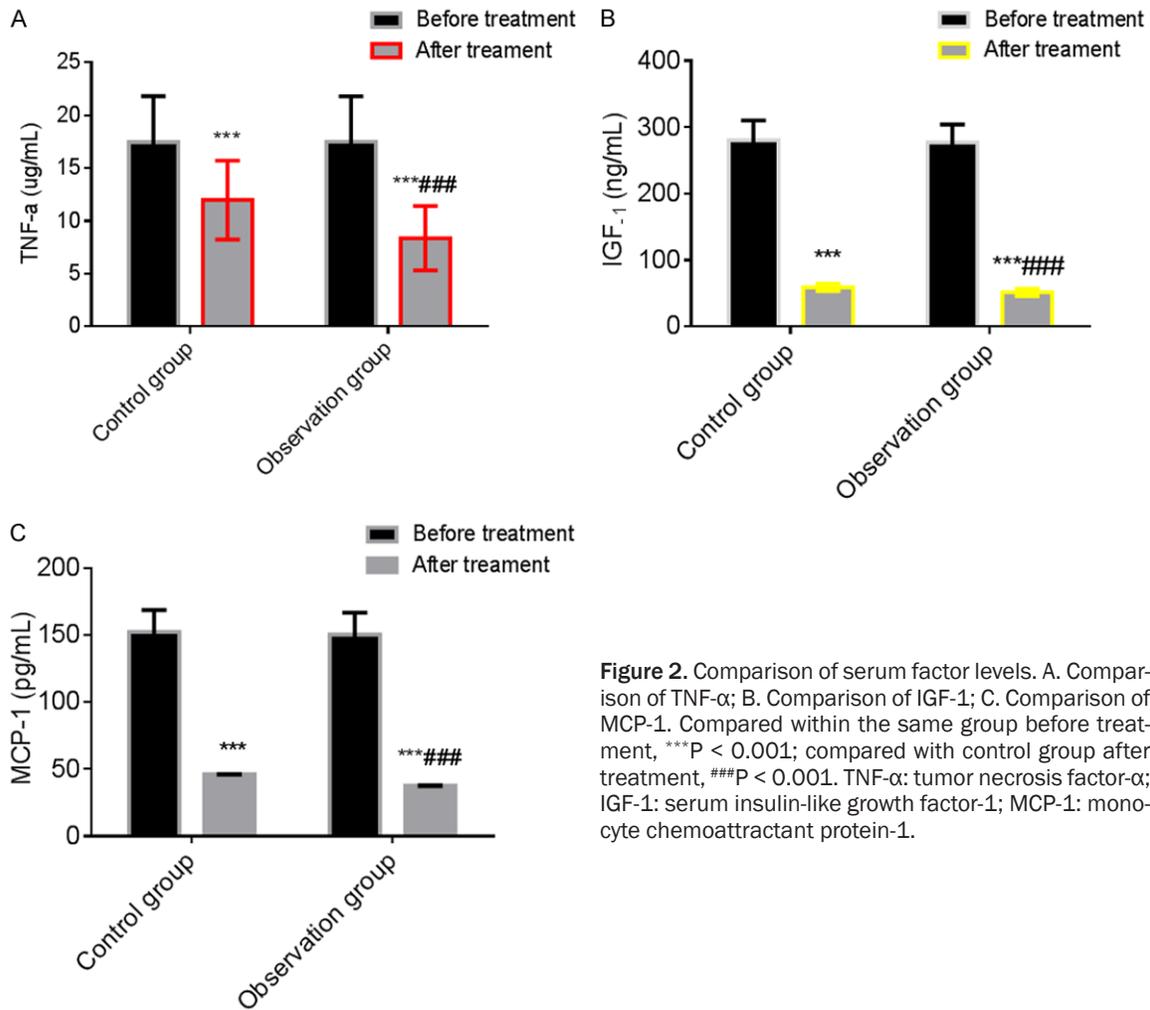


Table 6. Comparison of adverse reactions (n, %)

Group	Hypertension	Hypokalemia	Edema	Total incidence
Control group (n = 41)	1 (2.44)	1 (2.44)	2 (4.88)	4 (9.76)
Observation group (n = 45)	1 (2.22)	2 (4.44)	2 (4.44)	5 (11.11)
χ ²				0.022
P				0.883

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in the Du channel, among which the acupoints are related to the waist, Changqiang can clear away heat and damp, relieve spasm and dizziness; Yaoyu can clear away heat and dampness, regulate meridians and dredge collaterals; Yaoyangguan can regulate meridians and dredge collaterals, strengthen waist and tonify kidney; Mingmen can strengthen the waist and knees, strengthen yang and nourish the kidney, regulate meridians and Qi; Xuanshu can strengthen the waist and spine, warm the spleen and kidney. The joint stimulation of the above acupoints can regulate Qi and blood and smooth the body, which can better play the effect of improving systemic skeletal diseases. Moreover, acupuncture and moxibustion will not cause adverse reactions due to pharmacological effects. From the research results, there was no significant difference in adverse reactions between the two groups, and the observation group had no other body injury due to the increase of TCM therapy. At the same time, the patients were followed up for 3 months. It was found that the quality of life in the observation group was better compared with that in the control group, which reflected that the combination of Chinese and Western medicine had a good effect on the long-term prognosis of sciatica, which could help patients effectively improve the quality of life.

However, there were some limitations in this study, such as a small sample size and a short observation time, and the long-term efficacy of the patients was not fully observed. Moreover, due to the small sample size, the data with no difference in adverse reactions may be slightly lacking in reliability. In the future, a larger sample size, with multi-center and long-term research will be further discussed.

In conclusion, AMDCTA had a definite curative effect on sciatica, it could effectively improve patients' pain, functional activity and quality of life, reduce IGF-1, TNF- α and MCP-1 levels, proving it is safe and reliable.

Disclosure of conflict of interest

None.

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