

STUDY ON SPINAL CURVATURE CHANGES IN KUNG FU PRACTITIONERS



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ESTUDO SOBRE AS MUDANÇAS DE CURVATURA DA COLUNA VERTEBRAL DOS PRATICANTES DE KUNG FU

ESTUDIO SOBRE LOS CAMBIOS DE CURVATURA DE LA COLUMNA VERTEBRAL EN PRACTICANTES DE KUNG FU

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ABSTRACT

Introduction: Kung fu exercise has a significant effect in treating lumbar disc herniation, effectively meeting the internal and external circulation of the human body functional system, the lumbar intervertebral disc movement function can be effectively repaired. **Objective:** analyze and explore the effect of kung fu rehabilitation on symptoms of lumbar intervertebral disc herniation. **Methods:** 85 patients with lumbar disc herniation were randomly divided into a control and a kung fu group. **Results:** The comparison between the martial arts group before and after the experiment showed a very significant difference ($p < 0.05$); there was no significant difference in the control group. The total effective rate in the kung fu group was 97.67%, and the relapse rate was 2.33%. The total effective rate of the control group was 90.48%, and the relapse rate was 21.43%. **Conclusions:** Kung fu exercise is beneficial for the relaxation of waist muscles, relieves muscle tone, increases muscle strength, may improve clinical symptoms and signs of lumbar disc herniation. **Evidence level II; Therapeutic Studies - Investigating the results.**

Keywords: Martial Arts; Lumbar Region; Rehabilitation.

RESUMO

Introdução: O exercício de kung fu tem um efeito significativo no tratamento da hérnia discal lombar, atendendo efetivamente à circulação interna e externa do sistema funcional corporal humano, a função de movimento do disco intervertebral lombar pode ser efetivamente reparada. **Objetivo:** Analisar e explorar o efeito de reabilitação com kung fu nos sintomas da hérnia de disco intervertebral lombar. **Métodos:** 85 pacientes com hérnia de disco lombar foram divididos aleatoriamente em um grupo de controle e um grupo de kung fu. **Resultados:** A comparação entre o grupo de artes marciais antes e depois do experimento mostrou uma diferença muito significativa ($p < 0,05$); não houve diferença significativa no grupo controle. A taxa efetiva total no grupo de kung fu foi de 97,67%, e a taxa de recidiva foi de 2,33%. A taxa efetiva total do grupo de controle foi de 90,48%, e a taxa de recidiva foi de 21,43%. **Conclusões:** O exercício de kung fu é benéfico para o relaxamento dos músculos da cintura, alivia o tônus muscular, aumenta a força muscular; pode melhorar os sintomas clínicos e os sinais de hérnia de disco lombar. **Nível de evidência II; Estudos terapêuticos - Investigação de resultados.**

Descritores: Artes Marciais; Região Lombar; Reabilitação.

RESUMEN

Introducción: el ejercicio de kung fu tiene un efecto significativo en el tratamiento de la hernia discal lumbar, atendiendo eficazmente a la circulación interna y externa del sistema funcional del cuerpo humano, la función de movimiento del disco intervertebral lumbar puede repararse eficazmente. **Objetivo:** Analizar y explorar el efecto de la rehabilitación con kung fu en los síntomas de la hernia discal intervertebral lumbar. **Métodos:** 85 pacientes con hernia discal lumbar fueron divididos aleatoriamente en un grupo de control y un grupo de kung fu. **Resultados:** La comparación entre el grupo de artes marciales antes y después del experimento mostró una diferencia altamente significativa ($p < 0,05$); no hubo diferencia significativa en el grupo de control. La tasa de efectividad total en el grupo de kung fu fue del 97,67%, y la tasa de recaída fue del 2,33%. La tasa efectiva total del grupo de control fue del 90,48%, y la tasa de recidiva del 21,43%. **Conclusiones:** El ejercicio de kung fu es beneficioso para la relajación de los músculos de la cintura, alivia el tono muscular, aumenta la fuerza muscular; puede mejorar los síntomas y signos clínicos de la hernia discal lumbar. **Nivel de evidencia II; Estudios terapéuticos - Investigación de resultados.**

Descriptor: Artes Marciales; Región Lumbar; Rehabilitación.



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INTRODUCTION

Lumbar disc herniation is a common disease, frequently-occurring, it is more common in the elderly.¹ In the past ten years, with electronic products, the widespread popularity of e-commerce, and the changes in people's lifestyles, there are more and more sedentary people. At the same time, the incidence of the disease is increasing year by year, and

tend to be younger, affect the normal life and daily work of the patient, caused heavy losses to units and individuals.² In 2016, the Central Committee of the Communist Party of China, the "Outline of the "Healthy China 2030" Plan" issued by the State Council, emphasizing the goal of improving national health, this is the first time that our country has, from the perspective of general hygiene, propose a strategic plan in the field

of health.³ According to clinical studies, in China, 60%~80% of adults have experienced low back pain in their lives; The prevalence of lumbar disc herniation is about 18%, and the incidence rate is increasing year by year, and tend to be younger, seriously affected the daily work of patients, caused heavy losses to individuals and units. Therefore, how to effectively prevent the occurrence of the disease has become the focus of attention of the whole society.⁴

METHOD

Research objects

In this study, 85 patients with herniated disc undergoing rehabilitation treatment in the hospital were selected for the study, among them, 48 cases were males, there were 37 females, and the age distribution was 41.57 ± 13.54 years old, the distribution of disease course is 12.84 ± 8.94 months, CT showed that the number of cases of a single lumbar disc herniation was 41 cases, there were 29 patients with double lumbar disc herniation, all patients signed an informed consent form, willing to participate in this research.

Research methods

Divided into two groups according to different treatment methods, they are the control group and the martial arts group. The two groups of patients were in age, gender, the course of the disease and the number of cases of lumbar disc herniation were not statistically significant ($P > 0.05$). The control group was treated with physical therapy based on conventional treatment, on the basis of the treatment of the control group, the martial arts group is guided by professional martial arts coaches to practice, 6 times a week, 60 minutes each time. Training for half a year^[5].

Straight leg elevation time, pain degree score (VAS score) and recurrence were analyzed. Use the "Lumbar Spine Disease Treatment Score Sheet" developed by the Society of Surgery for scoring, calculate the improvement rate = (post-treatment score - pre-treatment score) / (normal score - pre-treatment score) * 100%. The cure is 100% improvement rate, the marked effect is more than 60%, 25%~60% is effective, and less than 25% is ineffective.

Statistical processing

Use SPSS13.0 statistical software for statistical description and analysis, the count data is expressed in the number of cases and percentages, the measurement data is expressed by the mean \pm standard deviation, the statistical methods are t test and chi-square test, and the test level is 0.05.

RESULTS

Experimental analysis of straight leg elevation before and after the experiment in different groups of the study population

Studies have shown that after targeted treatment and intervention, the martial arts group is significantly better than the control group in the straight leg raising experiment ($P < 0.05$), the comparison between the two groups before and after the experiment was statistically significant ($P < 0.05$). (Table 1)

Research indicates, after the experiment, it is statistically significant compared with before the experiment, $P < 0.05$; Compared with the control group, it was statistically significant, $P < 0.05$.

Table 1. Experimental analysis of straight leg elevation before and after the experiment in different groups of the study population.

Group	Number of cases (n)	Before the experiment	After the test
Martial Arts Group	43	35.01 \pm 6.04	68.25 \pm 8.19
Control group	42	34.51 \pm 6.27	58.16 \pm 8.16

Comparative analysis of the degree of pain (VAS value) before and after the experiment in different groups of the study population

The study showed that after the intervention, the martial arts group was significantly better than the control group in pain perception ($P < 0.05$), the comparison between the two groups before and after the experiment was statistically significant ($P < 0.05$). (Table 2)

Research indicates, after the experiment, it was statistically significant compared with that before the experiment, $P < 0.05$; Compared with the control group, it was statistically significant, $P < 0.05$.

Analysis of the therapeutic effect and recurrence of different groups in the study population

Research shows that the total effective rate in the martial arts group is significantly higher than that in the control group ($P < 0.05$), the recurrence rate in the martial arts group was significantly lower than that in the control group ($P < 0.05$). (Figure 1)

Figure 1 shows the rehabilitation effect of the martial arts group and the control group. 31 cases were cured in the martial arts group, 9 cases were markedly effective, 2 cases were effective, 1 case was ineffective, and 1 case was relapsed. The total effective rate was 97.67%, and the recurrence rate was 2.33%. In the control group, 16 cases were cured, 16 cases were markedly effective, 6 cases were effective, 4 cases were ineffective, and 9 cases were relapsed, the total effective rate was 90.48%, and the recurrence rate was 21.43%. There was statistical significance between the martial arts group and the control group, $P < 0.05$.

Table 2. Comparative analysis of the degree of pain (VAS value) before and after the experiment in different groups of the study population.

Group	Number of cases (n)	Before the experiment	After the test
Martial Arts Group	43	4.76 \pm 1.01	3.15 \pm 1.19
Control group	42	4.71 \pm 1.16	3.96 \pm 1.16

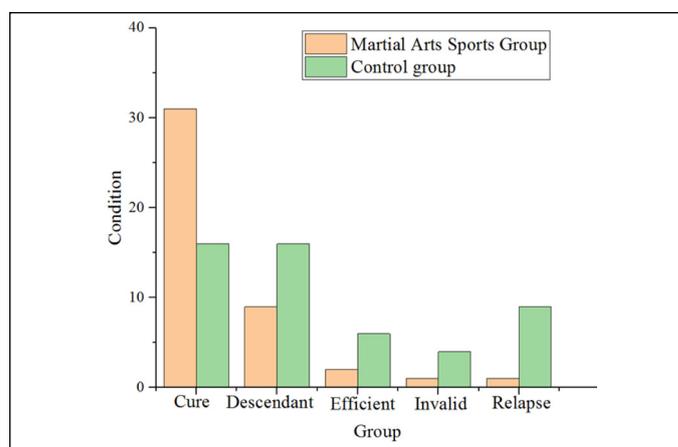


Figure 1. Analysis of the therapeutic effect and recurrence of different groups in the study population.

DISCUSSION

The lumbar disc is equivalent to a micro-moving joint of the human body, it is composed of hyaline cartilage plate, fibrous ring and nucleus pulposus, distributed between the lumbar vertebrae of the human body.⁶ Degenerative changes or trauma of the lumbar intervertebral disc can cause the annulus rupture, the nucleus pulposus prolapsed from the rupture, thereby compressing the nerves of the lumbar spine, and there is radioactive pain in the waist and legs, therefore, medical science believes that lumbar disc herniation belongs to the category of "back and leg pain, arthralgia". The most common clinical symptom

of lumbar disc herniation is pain, mainly manifested as low back pain, sciatica, typical sciatica: The main manifestations are radiating pain from the patient's buttocks, back of the thigh, outside of the calf to the heel or back of the foot.^{7,8} According to clinical studies, about 95% of patients with lumbar protrusion have different degrees of low back pain, 80% of patients have lower limb pain. Especially low back pain, not only is the most common symptom of lumbar disc herniation, it is also one of the earliest symptoms.

In martial arts, the waist is the central axis, rotate the waist to drive the limbs and torso to rotate left and right, a boxing technique with continuous speed, soft outside and rigid inside, slow and gentle, continuous movement and decisiveness, and a combination of movement and static. Martial arts emphasize waist, hip and spine exercises, can fully mobilize large muscle groups and small muscle groups (lumbar quadratus lumborum, psoas major, intertransverse muscle, multifidus, back erector spinae, iliac ribs, abdominal rectus abdominis, external obliques, etc.) sports, let the practitioners always remain active. Martial arts can delay the occurrence of muscle atrophy, make the muscles more elastic, greatly strengthen muscle control. Through regular practice of martial arts, first, it can relax muscles, relax ligaments, lengthen tendons, open joints, smooth meridians, and avoid body stiffness. The second is to improve the metabolic level of the patient's "red muscle", delay muscle atrophy, enhance muscle endurance, make muscles more elastic, and strengthen muscle control.⁹ At the same time, due to the slow movement of martial arts, the lumbar intervertebral discs of patients with different degrees of martial arts exercises have been repaired, elongation, reaching the traction effect of the lumbar spine, so as to achieve the role of treatment and prevention. The reason for the analysis is that martial arts can effectively relieve the relative position of the patient's intervertebral disc and nerve root, effectively relieve the compression of the protrusion on the nerve root, promote the resolution of local inflammation, relieve the load of

the joints of the patient's lumbar spine and improve the muscle spasm of the patient's lower back.¹⁰

The analysis of the therapeutic effect and recurrence of the two groups shows that, the total effective rate of martial arts group is 97.67%, the recurrence rate was 2.33%. The total effective rate of the control group is 90.48%, the recurrence rate was 21.43%. It can be seen that the use of martial arts has a good clinical effect on patients with lumbar disc herniation and should be promoted. Martial arts have the effect of preventing and treating lumbar disc herniation, the promotion and application of martial arts should be strengthened in patients with lumbar disc herniation, improve the probability of patients with lumbar disc herniation choosing martial arts, promote the role of martial arts in the treatment and control of lumbar disc herniation, provide effective measures for effectively controlling the incidence and development of lumbar intervertebral disc herniation.

CONCLUSION

Through six months of martial arts exercises for 43 patients with lumbar disc herniation, combining 42 patients with the same symptoms and signs for a controlled analysis, it is believed that martial arts is to improve the symptoms and signs of patients with lumbar disc herniation, an important means to promote disease recovery. Martial arts can improve the flexibility and other physical qualities of patients with lumbar disc herniation, improve waist, the stability of the iliac vertebrae, the range of motion of the lumbar spine tends to be normal. Martial arts exercises are beneficial to the relaxation of waist muscles, relieve muscle tension, increase muscle strength, it can improve the clinical symptoms and signs of lumbar disc herniation.

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AUTHORS' CONTRIBUTIONS: The author made significant contributions to this manuscript. ZS: writing and performing surgeries; data analysis and performing surgeries; article review and intellectual concept of the article

REFERENCES

1. Liao F, An R, Pu F, Burns S, Shen S, Jan YK. Effect of Exercise on Risk Factors of Diabetic Foot Ulcers: A Systematic Review and Meta-Analysis. *American Journal of Physical Medicine & Rehabilitation*. 2018;98(2):103-116.
2. Andersen SB, Birkelund R, Andersen M, Carreon L, Coulter A, Steffensen K et al. Factors Affecting Patient Decision-making on Surgery for Lumbar Disc Herniation. *Spine*. 2018;44(2):143-9.
3. Oh J, Jo D. Epiduroscopic laser neural decompression as a treatment for migrated lumbar disc herniation: Case series. *Medicine*. 2018;97(14):e0291.
4. Yuan S, Lin X, Hong J, Qiu C, Chen D. Effects of traditional Chinese exercise on lumbar disc herniation: A protocol of network meta-analysis of randomized controlled trials. *Medicine*. 2020;99(5):e18781.
5. Shen Y, Zhou Q, Zhang L, Gao L, Zhang D, Wang X et al. Electroacupuncture for lumbar disc herniation: A protocol for systematic review and meta-analysis. *Medicine*. 2020;99(17):e19867.
6. Chen W, Zheng Y, Liang G, Chen G, Hu Y. Clinical effects of transforaminal approach vs interlaminar approach in treating lumbar disc herniation: A clinical study protocol. *Medicine*. 2020;99(44):e22701.
7. Kögl N, Brawanski K, Girod PP, Petr O, Thomé C. Early surgery determines recovery of motor deficits in lumbar disc herniations—a prospective single-center study. *Acta Neurochirurgica*. 2021;163(1):275-80.
8. Oht-Nissen S, Fritz BG, Walbom J, Kragh KN. Bacterial biofilms: a possible mechanism for chronic infection in patients with lumbar disc herniation – a prospective proof-of-concept study using fluorescence in situ hybridization. *Apmis*. 2018;126(5):440-7.
9. Chiba K, Matsuyama Y, Seo T, Toyama Y. Condoliase for the Treatment of Lumbar Disc Herniation: A Randomized Controlled Trial. *Spine*. 2018;43(15):E869-76.
10. Son S, Sang GL, Yong A, Kim WK, Jeong TS. Outcomes of epiduroscopic laser ablation in patients with lumbar disc herniation. *Medicine*. 2020;99(51):e23337.