

# Research Progress of Cervical Pillow in Prevention and Treatment of Cervical Spondylosis

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**Abstract:** Cervical spondylosis is characterized by degeneration of cervical intervertebral disc into core, secondary changes of cervical tissue, compression of nerve and blood vessels. The global prevalence rate is high, with about 200 million patients in China. The high incidence, recurrence rate and youthful characteristics seriously affect the quality of life. The aggravation of nocturnal symptoms provides basis for the application of cervical pillow. The mechanism of cervical pillow is to maintain the dynamic and static balance of cervical spine. 3D printing technology helps the development of personalized corrective pillow. In clinical application, modern cervical pillows such as double horizontal type and adjustable shape can relieve symptoms, correct curvature and reduce recurrence rate when used alone; combination with drugs, acupuncture, massage and acupotomy can increase efficiency significantly, such as medicinal pillow combined with traditional Chinese medicine, combined with acupuncture and massage to form synergistic mechanism, combined with rehabilitation training or acupotomy can also improve the effect. Cervical pillow provides effective auxiliary means for prevention and treatment of cervical spondylosis.

**Keywords:** Cervical spondylosis, Cervical pillow, TCM treatment.

## 1. Introduction

Cervical spondylosis is a disease with degeneration of cervical intervertebral disc as the core pathological basis, accompanied by secondary changes of cervical muscles and joints and degeneration and hyperplasia of adjacent vertebral bodies, which further oppresses nerves, blood vessels and other tissues, causing a series of related clinical symptoms and signs. As one of the "Top Ten Persistent Diseases in the World" listed by the World Health Organization, the annual prevalence rate is as high as 23%, and it is the fourth largest factor causing disability. Its incidence is increasing year by year. According to statistics, there are about 200 million patients troubled by cervical spondylosis in China. The characteristics of cervical spondylosis such as high incidence, high recurrence rate and youth seriously affect people's behavior ability, quality of life and mental state, resulting in a large amount of medical expenditure and social economic burden [1,2]. Since cervical spondylosis patients often have the problem of aggravation or recurrence of symptoms at night, lying discomfort has become a prominent problem that seriously affects their work and quality of life. This also provides an important basis for the application of cervical pillow in cervical spine adjuvant therapy.

## 2. Mechanism of Cervical Pillow

### 2.1 Pillow Function

The origin of pillows can be traced back to ancient times, initially human beings to improve sleep comfort, with stones, hides, hay and other natural objects bedding the head of the simple device. The evolution of pillows has always been closely related to neck health and prevention of related diseases. Ancient doctors found through practice that the height, hardness and material of pillows are easy to induce neck discomfort. "Huangdi Nei Jing" proposed that "lying down, long neck pain", pointing out that too high a pillow

may lead to neck muscle strain; The Ming Dynasty "Surgical Authentic" records neck stiffness caused by "pillow discomfort, neck bone deviation", emphasizing that pillows should be "flush with shoulders, soft and hard properly". With the development of science and technology, people have a clearer understanding of their own structure. People have discovered the physiological curvature and stability of the cervical spine. The appropriate pillow is a kind of protection for the dynamic and static balance of the cervical spine. The emergence of 3D printing technology has led to the generation of personalized cervical correction pillows. The idea of individualized diagnosis and treatment in medical treatment has penetrated into various industries [3,4].

## 3. Clinical Application of Cervical Pillow

### 3.1 Prevention and Treatment of Cervical Pillow Alone

The modern cervical pillow mainly has the following characteristics: double horizontal cervical pillow: it can adapt to different sleeping positions through zoning design, it can fit the neck curve to provide support when lying on the back, which conforms to the physiological curvature of the cervical spine; it can stably support the head when lying on the side, avoiding excessive bending of the cervical spine [5]. Shape-adjustable cervical pillow: Most of them adopt inflatable structure or central cushion design, and users can flexibly adjust the pillow height or pillow shape according to their own body shape and comfort needs. However, the adjustment process of such products currently depends on personal experience and lacks professional guidance support [6]. Regardless of the material of cervical pillow, it is ultimately intended to serve people. Lai Jinquan [7] treated young and middle-aged patients with cervical spondylosis with multifunctional cervical health care pillow. Compared with ordinary pillow, it was finally concluded that multifunctional cervical health care pillow could alleviate clinical symptoms, correct cervical physiological curvature and reduce recurrence rate. Wu Qiang [8] et al. treated

patients with cervical spondylotic radiculopathy by warming meridians and dredging collaterals. Through one year's follow-up, it was concluded that warming meridians and dredging collaterals could effectively reduce the recurrence rate of cervical spondylotic radiculopathy.

### 3.2 Preventive and Therapeutic Effects of Cervical Pillow Combined with Drugs

The use of cervical pillow is often accompanied in the whole process of disease treatment. When the disease is in acute stage, drug coordination is indispensable. Other studies have shown that for patients with cervical spondylosis, the use of cervical pillow can reduce the degree of neck pain, improve the angle of neck flexion, right rotation, left rotation and extension, and help to restore normal cervical motion [9]. Zhuang medicine, as a splendid treasure in Chinese medicine culture, also plays an important role in the prevention and treatment of cervical spondylosis. Chen Haiyan treats patients with nerve root cervical spondylosis with Zhuang medicine cervical pillow combined with Zhuang medicine along tendons. Compared with flurbiprofen gel combined with cervical vertebra rice exercise group, the cure rate of the former is about 26% higher than that of the latter, and the cervical vertebra dysfunction index scale is obviously reduced [10].

### 3.3 Preventive and Therapeutic Effects of Cervical Vertebra Pillow Combined with Acupuncture

Acupuncture is one of the commonly used treatment methods for cervical spondylosis, which can effectively improve symptoms and relieve pain in a short period of time. Zeng Yingying [11] treated patients with cervical spondylosis of nerve root type of wind-cold-dampness type with traditional Chinese medicine pillow combined with electroacupuncture at Jiaji acupoint, while the control group was treated with electroacupuncture at Jiaji acupoint alone. The study showed that the cure rate and total effective rate of treatment were significantly better than those of the control group. Catgut embedding is a kind of acupuncture treatment. Research shows that it has a good therapeutic effect on cervical spondylosis [12]. Catgut embedding usually takes 1 time/2-3 weeks. If it is used in combination with cervical pillow, it can prolong the treatment time and reduce the number of visits. The interaction mechanism between cervical pillow and acupuncture in preventing cervical spondylosis can be summarized as "synergistic complement of mechanical support and functional adjustment". Cervical pillow provides continuous biomechanical correction by conforming to the physiological curvature of cervical spine [13], reducing mechanical compression of intervertebral disc, nerve and blood vessel, relieving static muscle strain, and laying a foundation for cervical structural stability.

### 3.4 Preventive and Therapeutic Effects of Cervical Pillow Combined with Massage

Massage manipulation is the most commonly used treatment method for neck discomfort, and it is also one of the first treatment methods that people think of. Tan Weixuan [14] used chiropractic massage combined with health pillow to treat nerve root cervical spondylosis. After 3 months of

treatment, the observation indexes such as Tanaka Jingjiu 20 score, VAS score and arc chord distance were better than those of the control group. Lin Bo combined cervical pillow with massage and neck traction to treat cervical vertigo. Compared with the control group, the cure rate was 35.6% higher and the uncured rate was 15% lower. When supine flexion and extension method was used to treat cervical radiculopathy with asymptomatic spinal cord compression, VAS score, JOA20 score, symptom and sign score and JOA17 score of patients were improved to varying degrees when combined with occipital cervical spine [15]. The combination of cervical pillow and massage works synergistically through "mechanical maintenance + dynamic correction". The former maintains the stability of cervical spine for a long time, while the latter dynamically improves the pathological state, forming a closed loop of prevention and treatment, improving the efficiency of symptom relief and recurrence prevention.

### 3.5 Prevention and Treatment of Cervical Occipital Joint with Other Treatments

Meng Xianrong [16] took pain score, cervical curvature, cervical rotation left and right as observation indicators, and found that cervical rehabilitation exercise combined with functional cervical pillow effectively improved the rehabilitation effect of cervical spondylosis patients. Acupotomy therapy is developed on the basis of ancient "nine needles" and has dual therapeutic effects of acupuncture and local minimally invasive surgery. This slight destruction is conducive to the stimulation of the body's rehabilitation ability and compensation mechanism, so that the body can better adapt to the degeneration of intervertebral discs and bone hyperplasia caused by cervical spondylosis [17, 18]. Zhang Huihao [19] found that the curative effect of small needle knife combined with cervical pillow was significantly higher than that of the control group in the experiment of clinical curative effect observation on nerve root cervical spondylosis. Zou Weidong [20] treated nerve root cervical spondylosis with small needle knife combined with traditional Chinese medicine pillow. After more than 3 years of follow-up, the cure rate was as high as 83.3%.

## 4. Discussion

Cervical Pillow is an auxiliary method for the prevention and treatment of cervical spondylosis. Its value has been clinically verified. In terms of mechanism, it maintains mechanical balance by conforming to cervical curvature and reduces mechanical damage during sleep. 3D printing technology promotes personalized application, echoing the requirements of ancient and modern pillow "adaptation". In clinical practice, it can relieve symptoms, improve curvature and reduce recurrence rate. Combined with drugs, acupuncture and massage, it has more synergistic advantages, such as improving cure rate and prolonging duration of treatment. But at present, adjustable pillow relies on personal experience adjustment, lack of professional guidance, the future needs to strengthen personalized parameter research, to provide a basis for standardized application.

## 5. Conclusion

Cervical Pillow is an effective auxiliary method for the

prevention and treatment of cervical spondylosis. It maintains mechanical balance by conforming to cervical physiological curvature and reduces sleep damage. 3D printing technology helps personalized application. In clinical practice, it can relieve symptoms, improve curvature and reduce recurrence rate. When combined with drugs, acupuncture, massage and acupotomy, synergy can significantly improve cure rate and stability of curative effect. However, the lack of professional guidance of adjustable pillow still needs to be solved, and the personalized parameter research should be deepened in the future to provide a more solid basis for its standardized promotion.

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