



# Exercise Biochemistry Review

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## Progression in rehabilitation of Upper Crossed Syndrome

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**Objective** At present, there is a growing number of potential people in the country who are prone to upper crossed syndrome (UCS), and compared with other musculoskeletal diseases, the etiology and treatments of the syndrome are still at an initial stage. On the other hand, the syndrome is a transitional stage between the normal cervical vertebra and cervical spondylosis, so it may be one of the important factors of cervical spondylosis which becomes younger in average age and happens more frequently. Domestic researches for UCS are not sufficient. There is no clear and unified conclusion on the pathogenesis of the disease, and there is also no systematic and efficient standard for its treatment. Therefore, the study of the UCS will help people fully understand the occurrence of cervical spondylosis, the mechanism of muscle imbalance and neck pain, it could lead to new further treatments of physical therapy and exercise therapy.

**Methods** A literature search was conducted for UCS studies using CNKI, Wan Fang database, VIP database, Pubmed, web of science, EMBASE, Cochrane Library. The Medical Subject Headings search terms used included rehabilitation therapy, neck pain, head pain, etiology, treatment, and combined keywords using upper crossed syndrome and UCS. According to the characteristics of the different databases, there is a joint search method for the keywords and free words. Two authors independently extracted relevant data according to the proposed inclusion and exclusion criteria, and then carry out full text reading after the literature that may be qualified or cannot be confirmed, so as to identify the literature that needs to be included. In the end, 40 literatures were finally included.

**Results** The causes of UCS may have bad posture, abnormalities of respiratory patterns, psychological factors, over excitation of sympathetic nerve, abnormalities of proprioception, acute and chronic injury. And, once that balance is broken, without interference, the neck and shoulders will form a vicious circle, and the human body's stress reaction will form osteophyte in the corresponding place, and damage intervertebral disc. According to the studies, all treatment methods have certain effects such as massage, acupuncture, strength training, breathing training, nerve sensation training, cognitive-behavioral therapy and so on.

1. Bad posture can cause the cervical vertebra physiological curvature to disappear, neck muscle length changes, abnormal tension, force imbalance. It can be treated with exercise therapy, including corrective training, north European walking, etc. We need to use strength training, posture correction, elastic band training and so on, to strengthen the relatively weakened or elongated muscles, and make the joints and muscles of shoulder or neck work under the correct rhythm, followed by the bone-setting manipulation (traction therapy, joint mobilization, Chinese traditional vertebra restoration method) can also have a good effect by solving problems such as abnormal cervical vertebra curvature, local nerve compression, small joint disorders and limited range of motion in a joint.

2. Abnormal breathing patterns make the accessory respiratory muscles constantly perform low load contraction, which gradually causes muscle fatigue. For some people with respiratory disorders or difficulties, in order to breathe more smoothly, will take a head forward posture to alleviate the resistance of the airway, so that they can not fully complete the original function of the accessory respiratory muscle. To this, abdominal respiration training can regulate the balance of the major respiratory and accessory respiratory muscles function, and reduce the excitability of sympathetic nervous, thus relaxing the dominant muscles.

3. Most psychological problems are characterized by progressive and concealed, which not only have a negative impact on people's psychology, but also can not be ignored in physiology. Psychological effects may change the neurotransmitter, 5-HT and corticotropin-releasing factors in the body, which causes the human body to suffer from muscle pain, tension, movement uneasiness manifestation. It is the first time that the human body has suffered from muscle pain, nervous and fidgety movements. Therefore, some scholars proposed to use cognitive-behavioral therapy (CBT) to carry on the improvement to this problem. It includes specific behavior and cognitive corrections to correct body and mental abnormalities.

4. At present, some researchers have found that the neural sensation, especially the abnormalities of proprioception, is closely related to the abnormal postures. For UCS, long-term abnormal posture, the abnormal signals that feed back to the proprioception are gradually weakened and eventually ignored or considered normal by the brain center. Therefore, the proprioception should be reactivated under the correct posture. The correct feedback signal can be activated by proprioception training and Kinesio taping. And the Kinesio taping can make indirect effect on the sensory system, at the same time it can reduce the pressure of local tissue and speed up the blood circulation. This can accelerate the metabolism of muscle and help the recovery of muscle fatigue.

5. Most of these causes of UCS will lead to pain, inflammatory, fascia adhesion. Chinese traditional methods of rehabilitation and physiotherapy are commonly used in treatment. Massage therapy, Chinese acupuncture treatment including acupuncture point injection therapy, and Chinese needle-knife therapy can play a role in warming Yang and eliminating cold, reducing swelling and relieving fatigue. Chinese needle-knife therapy by cutting muscle fascia, stripping, relaxation, unclogging, promoting blood circulation, etc. It is necessary to adjust the biomechanics of the human body and restore the balance of motion. The Chinese herbal medicine can make the human body live blood for pain and pain, and it can be applied outside, taken inside and combined with other treatment methods. Medium and low frequency treatment, infrared treatment, waxwork and other physical therapy methods, using sound, light, cold, heat, electricity, magnetic force (motion and pressure) and other physical factors for treatment, aiming at local or systemic functional disorders or diseases of the human body. The physical factors therapy is non-invasive and non-drug treatment, which is necessary to restore the original physiological functions of the body.

6. China has a variety of martial arts since ancient times, including Baduanjin exercise, five-animal exercises and Tai Chi. With the aim of physical fitness and relatively gentle physical activity as the basis, the physical and mental state need combine body, breath and heart adjustment, which play a role in strengthening the body, adjusting breathing and maintaining health.

**Conclusions** In summary, traction therapy, Chinese traditional needle-knife have high requirements for equipment and venues, and are expensive and not suitable for public use. The Chiropractic therapy, joint mobilization and Chinese traditional vertebra restoration method have high risks, and the requirements on the experience and technique of the operator are higher. And other treatments have their own characteristics. Therefore, in the actual treatment process, various factors should be considered comprehensively to carry out treatment. Treatment of primary and secondary order, consider, from the pathogenesis of UCS should give top priority to posture correction, daily lifestyle management, including breathing training, strength training, relaxation therapy, second along with Chinese acupuncture and physical therapy, such as nerve sensation training, finally martial arts, as an education and mission project, guide the patient carry out the rehabilitation by themselves. It is still not clear how to prevent UCS and what treatment sequence should be used to treat different causes of UCS at home and abroad, which need to make further study.