



Research Article

ISSN : 0975-7384
CODEN(USA) : JCPRC5

The latest research about sports injury treatment

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ABSTRACT

Sports injuries can affect the athlete's performance and even their sports life, sports injury mechanism is muscle damage, oxidative stress and inflammation in these three areas. Diet therapy and traditional Chinese medicine treatment can improve the treatment of these three aspects of sports injuries, digging deep to explore its mechanisms and treatment modalities will provide broad prospects for rehabilitation of sports athletes and sport development.

Keywords: Sports injuries, Chinese medicine, Treatment, Antioxidant, Anti-inflammatory

INTRODUCTION

Exercise-induced fatigue is the body caused by the movement itself, "the body's physiological process can not continue its function at a particular level, or can not maintain a predetermined exercise intensity," the body's decreased exercise capacity phenomenon. Sports injuries can lead to life-shortening movement of athletes or even terminate, using a variety of methods and effective treatment of sports injuries is currently the focus of attention, this paper home and abroad for treatment of sports injuries are reviewed.

Possible mechanism of sports injury

Fatigue or unaccustomed strenuous exercise can cause exercise-induced muscle damage(EIMD), which can lead to muscle aches, muscle strength temporarily reduce the swelling, inflammation and blood myogenic protein rise. Now that the mechanism of sports injuries is that muscle damage, oxidative stress and inflammation in these three areas.

Although the exact mechanism of muscle damage remains unclear, but it is certainly a mechanical and metabolic pathways involved, and the extent of the damage is affected by the duration of the pattern, intensity and movement [1, 2]. A damage model is divided into two general phases, have been proposed: occurred during (i) the main exercises involving mechanical damage and metabolic changes, and (ii) secondary damage associated with inflammation [3,4]. Although EIMD involve complex interactions of events, which seem to include muscle rupture due to myofibrils, impaired excitation-contraction coupling associated with changes in intracellular calcium homeostasis, oxidative stress and inflammation. These events will result in destruction of the bone structure and degradation of muscle cell membranes, resulting in necrosis of the fibers and the fibers resulting in remodeling.

Movement can cause oxidant and antioxidant levels imbalance, which is called oxidative stress [5]. This phenomenon is due to the movement in the long term and in response to the production process EIMD active oxygen. ROS as EIMD media played an important role. Although it is generally believed that reactive oxygen species resulting in incremental lipids, proteins and DNA oxidation markers, ROS on EIMD action seems critical internal oxidation in skeletal muscle associated with the oxidation-reduction sensitive areas. Aside from its negative effects, ROS can also lead to positive results, such as the contraction of muscle fibers to induce the adaptive response and regulation of gene expression [6, 7].

Intense physical exercise, especially eccentric exercise, triggers a rapid and continuous invasion of inflammatory cells in the muscles which can last several days to several weeks. White blood cells are the major inflammatory cells in increasing concentrations of the media and EIMD is considered mainly due to neutrophils and monocytes / macrophages were increased. Also during lymphocyte recruitment immediately after strenuous exercise, but their number is declining exercise ends. Inflammatory process is considered to be such a regulation: (i) neuroendocrine factors, such as epinephrine, norepinephrine, growth hormone, and cortisol (ii) cytokines, namely pro-inflammatory cytokines such as tumor necrosis factor- α (TNF - α) and interleukin-1 β and inflammatory cytokines in response to IL - 6. Although it is generally considered to have a central role of cytokines in the inflammatory process, the precise mechanism of action of each is remain unclear. Endothelial cells also regulates inflammatory reactions play a significant role, i.e. (i) by the expression of leukocyte adhesion molecules, wherein the factor determining the influx of neutrophils and monocytes, (ii) possible through production of NO, It is a vasodilator, and (iii) through the secretion of cytokines such as IL-1 α and-1 β , IL-6 and IL-8's. Local inflammatory process is called systemic reactions acute phase response, similar to what happened in the infection [8, 9].

Nutritional strategies in sports injury

Since more than once a day super athlete training is often a daily schedule their programs, therefore, to maximize and accelerate the recovery of athletes is crucial [10]. Some of the interventions is thought to reduce the negative impact associated with EIMD, such as nutrition, pharmacological strategies, electrical and manual therapy, cry therapy and positive exercise [2, 11]

With training programs become more demanding of any possible help, and should be considered, and nutrition is an area apparently can make a difference. In view of keeping the physiological needs of a mandatory, it is possible to make numerous benefits to maximize their training program intake of food athletes. Recover faster and more efficiently will allow athletes to train more, train more positive response, leading to the expected performance improvements. It has been well said that the recovery process after exercise, the optimal nutrition intake occasion is essential to promote muscle repair and regeneration of plants [12]. After some nutritional interventions have been considered capable of EIMD assist recovery.

Now that the use of a combination of carbohydrates and proteins, as well as physiological doses of antioxidants and / or anti-inflammatory nutrients, these interventions will help to restore the athletes. The role of fish oil have anti-inflammatory, and experimental studies have found fish oil to give athletes strenuous exercise, which greatly reduces fatigue, plasma thiobarbituric acid reactive substances (TBARS) was significantly lower ($P < 0.05$), 48 and 72h after sports and had a lower hydrogen peroxide-induced DNA damage [13]. A study found that vitamin C and E supplementation plays a role in reducing muscle damage markers of aerobic exercises [14]. Although the food is very little research to replace nutrients, but their results indicate that food could be a favorable option as the recovery strategy. To date, only milk, cherries, blueberries and pomegranates were tested that have these effects on the recovery of sports injury. Those food rich in protein, carbohydrates and antioxidants and / or anti-inflammatory nutrients are still in the study.

Chinese medicine in sport injury

Since the 1980s, China's sports medicine community has begun to attach importance to traditional Chinese medicine and is committed to help eliminate sports fatigue and improve exercise capacity in research, and has achieved remarkable results.

Eliminating sport fatigue and promoting sports medicine athletic ability recovery by Chinese herb is a hot research topic. The traditional view is that the emergence of sports fatigue and body energy expenditure during exercise, the body metabolite accumulation and environmental changes and other factors. In terms of measures to combat the fatigue generated by one of the commonly used methods that give athletes against sports nutrition supplements. With the development of mechanisms and methods for study of modern Chinese medicine theory, proposed update cell medicine, modern pharmacology theory and modern biotechnology, medicine eliminating sport fatigue still need to increase efforts. Zhou Zhihong found that Shen Yi Yuan enhanced aerobic and anaerobic exercise mice swimming endurance, improved exhaustive swimming mouse skeletal muscle metabolism and cellular energy metabolism of free radicals, enhanced the body for exercise capacity and promoted the recovery of sports fatigue [15].Pan Shanshan discussed the changes in the next class Spleen sports fatigue state plasma atrial natriuretic peptide from the overall concept of traditional Chinese medicine, and studied the impact of Chinese Traditional Herbs on improving the class spleen and promoting exercise fatigue eliminate[16]. Wei Dunlei found after taking "Jian Li Fang", the content of hemoglobin in mice and testosterone in rats increased which implied this Chinese medicine had anti-anoxia and anti-fatigue effect [17]. Single Chinese herbs also can eliminate sports fatigue and improve exercise capacity such as pollen can significantly improve the ability of the heart to work, enhance endurance and muscle strength in animal and human experiments [18]. Modern pharmacological studies have shown that ginseng

can improve cardiac contractility and frequency of the nervous system stimulant; while also lower blood sugar, and promote the role of gonadal function. Yang Shuji reported Compound Chinese potions can shorten the time to eliminate fatigue, improve athletic performance [19]. Honokiol, a bioactive component isolated from the Chinese herb *Magnolia officinalis*, is known for its potent antioxidative and anti-inflammatory effects. Honokiol protects rats against eccentric exercise-induced skeletal muscle damage by inhibiting NF-kappaB induced oxidative stress and inflammation [20].

CONCLUSION

Sports injury mechanism is very complex, there are still a lot of need to explore, to find more effective medication and treatment is the focus of the study, I believe that with the deepening of molecular genetic techniques, treatment of sports injuries will be further improved, but also will promote the development of sports.

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