JTCM 中医杂志 Journal of Traditional Chinese Medicine

Online Submissions: http://www.journaltcm.com
info@journaltcm.com

J Tradit Chin Med 2017 February 15; 37(1): 49-56
ISSN 0255-2922

CLINICAL STUDY

Guasha improves the rating of perceived exertion scale score and reduces heart rate variability in male weightlifters: a randomized controlled trial

Wang Xingze, Chen Peijie, Huang Xingyu, Wang Yingying, Yang Jinsheng, Wichai Eungpinichpong, Yang Yuming, Uraiwan Chatchawan

Wang Xingze, Huang Xingyu, Yang Yuming, Research Center on Physical Education and Health Education in Gannan Normal University, Ganzhou 341000, China
Chen Peijie, School of Kinesiology, Shanghai University of Sport, Shanghai 200438, China
Wang Yingying, Yang Jinsheng, Institute of Acupuncture and Moxibustion, China Academy of Chinese Medical Sciences, Beijing 100700, China
Wichai Eungpinichpong, Uraiwan Chatchawan, Research Center in Back, Neck, Other Joint Pain and Human Performance, Khon Kaen University, Khon Kaen 40002, Thailand
Supported by the National Natural Science Foundation of China (Research of the Biological Effects and Mechanism of Different Guasha Therapies, No. 30672720); the National Natural Science Foundation of China (Comparative Research of Different Acupuncture Stimulation Methods on The Expression of Effects in Acupoint Areas, No. 81674079)
Correspondence to: Prof. Yang Jinsheng, Institute of Acupuncture and Moxibustion, China Academy of Chinese Medical Sciences, Beijing, 100700, China. zml@ibucm.com
Telephone: +86-13901129905
Accepted: September 29, 2016

Abstract

OBJECTIVE: To evaluate the effects of Guasha therapy on the rating of perceived exertion (RPE) scale score, and heart rate variability (HRV).

METHODS: A randomized controlled trial of Guasha (skin scraping) was compared with a sham scraping group and control group. Sixteen sessions within an 8-week period were completed. Sixty-five male weightlifters who had undergone normal weightlifting training for a mean of 5 years before study commencement were recruited. The RPE scale score of "snatch", "clean and jerk" maneuvers (85% of one-repetition maximum), and HRV were measured before and after the intervention.

RESULTS: The RPE scale score for snatch, clean and jerk were reduced significantly after intervention in the Guasha group and sham group. However, there was a significant difference in the low frequency (LF) domain and LF/high frequency (HF) ratio ($P < 0.05$): the LF domain decreased, and the LF/HF ratio decreased.

CONCLUSION: Guasha could be used to reduce the RPE scale score, and increase the response to HRV. Guasha could be considered as an alternative to some types of recovery from sports training.

Key words: Scraping therapy; Heart rate; Rating of perceived exertion; Weightlifting training; Randomized controlled trial

INTRODUCTION

To improve the effects of training, sports coaches look for ways to aid recovery from fatigue. Thai traditional massage, acupuncture, and "tui na" (traditional Chinese massage) are considered appropriate and effective methods to aid recovery from fatigue. The speed of recovery from muscle fatigue after each training session is important for weightlifters.

Another form of traditional Chinese therapy, "Guasha", is defined as the physiotherapy of scraping repeatedly on a certain body area using a blunt, spoon-like object. Guasha increases the temperature of local skin,

the volume of blood perfusion, and the microcirculation in healthy subjects,[1-3] and reduces muscle pain in patients with chronic neck pain.[4,5] Moreover, a study in rats has suggested that Guasha increases the activity of superoxide dismutase, bilirubin concentration, and white blood cell count.[6,7] Guasha can be used to improve players' ability by reducing the weight sensation and release of creatine kinase.[8]

Heart rate variability (HRV) is a key marker used to evaluate fatigue severity.[9] Physiologic studies have shown that, in general, high variability of the inter-beat interval corresponds to enhanced activity of the parasympathetic nervous system, whereas low variability of the inter-beat interval suggests strengthened activity of the sympathetic nervous system.[10] The rating of perceived exertion (RPE) scale is a measurement of perceived exertion. The RPE scale score shows the level of training or sense of "heaviness" during physical effort as estimated by a specific rating method.[11,12] Guasha has been used as effective therapy for many years in China. However, studies on Guasha (especially in exercise training) are limited. Therefore, the present study aimed to evaluate the effects of 8 weeks of Guasha on HRV and the RPE scale score in weightlifters.

MATERIALS AND METHODS

Study design

The present study was a randomized controlled trial. For individuals who met the inclusion criteria (The subjects who have been no injury in the last 6 months, no smoking, no alcohol, no history of hormone therapy, and no current health problem), subjects at the same level were allocated randomly (using the method of stratified random allocation) to the Guasha group (GG), sham scraping group (SSG), or control group (CG) (Table 1). Duration of 8 weeks (16 sessions) was chosen to observe the responses to Guasha on participants. A flow diagram of the trial is shown in (Figure 1). All Guasha therapists have been trained and had certificate about Guasha therapist.

Monitoring of normal weightlifting training

Only the coach controlled weightlifting training. The coach did not know which group the participants were in. This experiment took place in November and December 2013, and January 2014. Each weightlifting training session had three parts: warm up; main part of training; relaxation training (participants massaged each other). The volume of weight training increased during the study, and the training program with regard to intensity/volume is shown in Table 2.[13-15]

Participants

The study cohort was 65 male weightlifters from the Weightlifting Training Center in Jiangxi Province (China). Two participants were lost in the GG and SSG, because of injury and family matters (Figure 1). Participants underwent a physical examination to exclude health problems or injuries. At baseline, the mean age was (20.6 ± 1.7) years, mean weight was (75.3 ± 20.3) kg, mean height was (172.7 ± 6.4) cm, and mean body mass index was (23.7 ± 2.4) kg/m^2. Duration of pre-study training was (5.8 ± 0.6) years, and mean athletic level was (2.0 ± 0.6). Titles of athletes in China are "international master of sports" (1++), "master of sports" (1+), "first grade" (1), "second grade" (2), "third grade" (3), and "young athlete" (4).[16] All weightlifters were informed about the nature and risks of the experimental procedures before they provided written informed consent to participate. The study proposal was approved by the Ethical Committee of Khon Kaen University (Khon Kaen, Thailand) and the Chinese Clinical Trial Registry (ChiCTR-ICR-15006302) in Chengdu (China).

Guasha intervention

The instruments used to carry out Guasha were a buffalo-horn scraper and a skin lubricant (Jinlongkang; Scraping Cupping Research Institute, Beijing, China) to reduce friction. The head, neck, and back of each participant were scraped about 45° between the scraper and skin. Scraping was done at 08:30-11:30 on Thursday and Sunday, two sessions per week for 8 weeks, for a total of 16 sessions (Figure 2).[17-19] Definitions of Guasha and sham scraping are shown in Table 3. The number of strokes was 60 for the head, neck (60), whole back (40), upper back (40), middle back (40), and lower back (20). Total duration of Guasha was 20 min.

Table 1 Number of participants at each athletic level

Athletics level	Symbol	Training period (average years)	Guasha group (*n*)	Sham group (*n*)	Control group (*n*)
International masters of weightlifting	1++	>10	1	1	1
Masters of weightlifting	1+	8	3	3	3
First grade level	1	6	5	6	5
Second grade level	2	4-5	5	6	5
Third grade level	3	2-3	5	5	5
Young athletes level	4	2	2	2	2
Total			21	23	21