

# Discussion on the Effect of Table Tennis on Improving Cardiopulmonary Function in Patients with Mild Heart Failure

Yiming Li

School of Physical Education, Anyang Normal University, Anyang, Henan, 455000, China

**Abstract:** Objective to study the effect of table tennis on cardiopulmonary function in patients with chronic heart failure. Methods 94 patients in our hospital were randomly divided into observation group and control group by numerical table method, both groups were 47 cases, the control group was treated by intravenous drip of Guaweipi injection, and the observation group was treated by table tennis exercise on this basis. After treatment, the clinical efficacy and changes of LVEF values before and after treatment were compared between the two groups. Results the total effective rate of treatment in the observation group was 89.36%, which was significantly higher than that in the control group (76.60%), and the difference was statistically significant ( $P<0.05$ ). Significantly higher, the difference was statistically significant ( $P<0.05$ ). The levels of VR, LVDd and E/Ea in the observation group were significantly better than those in the control group, the  $t$  values of the two groups were -4.12, -3.22 and -2.21 respectively, the difference was statistically significant,  $P<0.05$ . Conclusion Table tennis exercise has a significant effect in the treatment of chronic heart failure, can improve the LVEF value, and has high clinical application value.

**Keywords:** Table Tennis, Melon Peel, Chronic Heart Failure, Cardiopulmonary Function

Chronic heart failure is myocardial damage caused by cardiomyopathy, myocardial infarction, inflammation, hemodynamic overload, etc., which can lead to changes in myocardial structure and function, and ultimately induce a decline in ventricular pumping and filling functions. The main clinical symptoms are fatigue. Breathing disorders, etc. [1]. At present, it is clinically believed that the key to its treatment lies in improving symptoms, targeting the mechanism of myocardial remodeling, and inhibiting the development of myocardial remodeling, thereby reducing the death caused by chronic heart failure [2]. This study focuses on table tennis, and explores the application value of table tennis in chronic heart failure. The results are now reported as follows.

## 1. Materials and Methods

General data 94 patients with chronic heart failure in our hospital from July 2017 to September 2019 were selected as the research subjects, including 50 males and 44 females, aged 24-78 years old, with an average of  $(50.34\pm 5.07)$  years old; underlying diseases Including 5 cases of rheumatic heart disease, 6 cases of pulmonary heart disease, 11 cases of hypertensive heart disease, 22 cases of coronary heart disease, and 3 cases of dilated heart disease. The above patients all met the diagnostic criteria for chronic heart failure in the Guideline to the Research on Medicines of china [3], and with reference to their cardiac function classification, the patients in this study were divided into 18 cases of grade II, 18 cases of grade III, and 18 cases of grade IV. Grade 11 cases. The baseline data such as gender, age, underlying disease, and cardiac function classification were not statistically significant ( $P>0.05$ ), which were comparable.

Treatment methods Both groups were treated with conventional treatment methods, including angiotensin, clopidogrel, beta-blockers, angiotensin-converting enzyme inhibitors, nitrates, digitalis preparations and statins lipid-lowering drugs. The control group was given Gualoupi injection (Z20027540, production unit: Shanghai No. 1 Biochemical Pharmaceutical Co., Ltd.), 8 mL dissolved in 5% glucose injection or 0.9% sodium chloride injection, and intravenous drip in 250 mL. 1 time/d, 1 week as a course of treatment.

The observation group was given table tennis exercise therapy on this basis. Specific method: first touch the ground with the middle part of the foot. This reduces vibration and relieves stress on your calf

muscles and tendons while preparing you for the next step. To achieve the purpose of the experiment. We require that the end of the subject's center of gravity must keep the head, hips, and feet in a straight line when landing. Keep the trunk upright, with both eyes looking straight ahead. Normally, starting from the neck, a straight distance must be maintained to avoid instability caused by body distortion. Keep your elbows bent at about a 90-degree angle as you run. Relax your arms as much as possible during your run while maintaining a consistent stride with your legs. Swing your arms up or down as you run, swinging your hands up to sternum level and down to your belt. In order to maintain an athletic posture, the knee joint should not be raised too high or too low; when participating in middle and long distance running. Don't lift the knees too high; when sprinting, we try to raise the knees as high as possible to increase the speed and strength in other places. When jogging, the muscles of the whole body should be relaxed, and the breathing should be deep and long, slow and rhythmic. It can be exhaled with two steps, inhaled with two steps, or exhaled with three steps, and inhaled with three steps. , tuck your belly when you exhale. When jogging, walk briskly and swing your arms naturally. The amount of jogging exercise is appropriate to run 20 to 30 minutes a day, but it must be persisted for a long time to be effective. Jogging can be divided into in-situ running, free running and quantitative running. Running in situ means jogging in the same place. At the beginning, you can run 50 to 100 steps each time, and gradually increase it gradually. After 4 to 6 months, you can increase to 500 to 800 steps each time. Running with high legs can increase the intensity of exercise. Free running is to change the running speed at any time according to one's own situation, without limitation of distance and time. Quantitative running has time and distance limitations, that is, running a certain distance within a certain time, from less to more, and gradually increase.

Observation indicators and efficacy judgment ① According to the "Guidelines for Clinical Research of New Chinese Medicines" [3], it is divided into three criteria: markedly effective, effective and ineffective. Markedly effective: after treatment, the cardiac function drops to grade 1 or the improvement exceeds grade 2, and clinical symptoms Symptoms and signs are improved; effective: the cardiac function has improved by grade 1 or above, but not to grade 1, and clinical symptoms and signs have recovered to a certain extent; invalid: no significant change or aggravation of cardiac function, or death. The total efficiency is the sum of the apparent efficiency and the effective efficiency. ②The LVEF value of patients was measured by echocardiography before and after treatment.

Statistical methods Statistical software SPSS19.0 was used to analyze and process the research data. The count data collection rate (%) was expressed, and the measurement data line ( $\pm$ s) was expressed. The comparison between groups was carried out by X2 test and t value test, with  $P < 0.05$  was considered significant and statistically significant.

## 2. Results

### 2.1 Comparison of Treatment Effects between the Two Groups

The total effective rate of treatment in the observation group was 89.36%, Significantly higher than the control group (76.60%), the difference was statistically significant ( $P < 0.05$ ), as shown in Table 1.

Compared with the control group, the value reaches 76.60%, which is obviously significant; it has a certain value in terms of statistical significance. The specific values are shown in Table 1.

Table 1: Comparison of treatment effects between the two groups

group	Number of cases	significant	efficient	invalid	Total effective rate [number of cases (%)]
observation group	47	32	10	5	42(89.36)
control group	47	27	7	13	34(72.34)
X2					4.398
P					<0.05

### 2.2 Comparison of LVEF Values before and After Treatment between the Two Groups

After treatment, the LVEF value of the observation group was significantly higher than that of the

control group, and the difference was statistically significant ( $P < 0.05$ ), as shown in Table 2.

Table 2: Comparison of LVEF values between the two groups before and after treatment ( $\pm$ , %)

group	Number of cases	before training	after training
observation group	47	39.31 $\pm$ 9.57	50.67 $\pm$ 10.88
control group	47	39.66 $\pm$ 10.03	42.61 $\pm$ 10.02
t		0.173	3.736
P		>0.05	<0.05

### 2.3 Comparison of Cardiac Function-Related Indicators between the Two Groups of Patients after Treatment

The levels of VR, LVDd and E/Ea in the observation group were significantly better than those in the control group, the t values of the two groups were -4.12, -3.22 and -2.21 respectively, the difference was statistically significant,  $P < 0.05$ . See Table 3.

Table 3: Comparison of cardiac function-related indicators between the two groups after intervention ( $\pm$ )

group	VR/ second branch <sup>-1</sup>	LVDd/mm	E/Ea
observation group(n=47)	73.21 $\pm$ 3.55	45.78 $\pm$ 3.00	8.38 $\pm$ 2.22
Control group(n=47)	82.02 $\pm$ 5.76	52.14 $\pm$ 5.48	10.81 $\pm$ 2.68
t	-4.12	-3.22	-2.21
P	<0.05	<0.05	<0.05

### 3. Discussion

Water decoction of melon wilt can inhibit drug-induced arrhythmias. Studies have confirmed that melon wilt decoction can prevent calcium chloride-induced ventricular fibrillation in rats by intraperitoneal injection in advance, and can improve the ventricular fibrillation induced by ouabain treatment in guinea pigs. Threshold dose for tachycardia [4]. It is recorded in "Compendium of Materia Medica" that "the long-term growth of the turquoise building is in the phlegm turbidity, so the chest and chest are blocked, and this is not the case." Its extract can reduce serum cholesterol, low density lipoprotein and triglyceride to a certain extent.

Table tennis has a positive effect on maintaining good heart function in middle-aged and elderly people, preventing the decline of lung tissue elasticity, preventing muscle atrophy, preventing coronary heart disease, hypertension, arteriosclerosis, etc. [5]. During jogging, the running rhythm should be maintained as constant as possible, with the trunk straight, the arms bent, and the hands relaxed. The head cannot swing. Breathing should also be rhythmic, inhaling through the nose and exhaling through the mouth to avoid side effects. Although running is simple, if the posture is not correct, it will not only fail to achieve the ideal fitness effect, but may also cause damage to the body [6]. When running, the leg movement should be relaxed. When one leg kicks back, the other leg bends the knee and swings forward, the calf naturally relaxes, and relies on the forward swing of the thigh to drive the hip to swing forward and upward. Land on your heels first, then quickly transition to full-foot landing. Running with the soles of your feet on the ground can easily lead to tibial periostitis in the long run. Also, it's important to swing your arms naturally when running. Correct arm swing posture can play a role in maintaining body balance and coordinating cadence. When swinging the arms, the shoulders should be relaxed, the arms should be bent at about 90 degrees, and the hands should be half-clenched and swing naturally, slightly inward when swinging forward, and slightly outward when swinging back. Jogging is effective no matter when it is started, and the intensity of exercise should be gradual. At first, you can run less, or run once every other day. After a period of exercise, gradually increase to 3,000 to 4,000 meters per day. The weekly increment is 5% to 10% of the running amount of the previous week. When jogging, the movements should be natural and relaxed, and the breathing should be deep, long and rhythmic, and do not hold your breath. The running speed should not be too fast, do not run fast or sprint. To maintain a uniform speed, it is appropriate to have a relaxed atmosphere in which you do not feel uncomfortable, pant, or flush, and can talk while running. Objectively, when jogging, the heart rate per minute does not exceed 180 minus age. For example, the heart rate of a 60-year-old jogging is

180-60=120 beats per minute. The running speed of patients with severe chronic diseases can be appropriately reduced and the distance can be shorter to prevent the lack of endogenous oxygen. In this study, the clinical effect and LVEF value improvement of the observation group treated by table tennis exercise were better than those of the control group, which showed that the treatment effect was better than that of the melon welt skin injection alone.

In conclusion, table tennis exercise has a significant effect in the treatment of chronic heart failure and has high practical application value.

## References

- [1] Chen Qiu, Liu Xueqiang, Li Qingfu, etc. Myocardial protective effect of safflower yellow on patients with pulmonary heart disease and heart failure. *Southwest National Defense Medicine*, 2014, 24(4): 378-380.
- [2] Zhou Songjing, Li Yuling, Huang Dongmian, etc. Observation on the curative effect of safflower yellow pigment injection in the treatment of 38 cases of unstable angina pectoris of coronary heart disease. *Hainan Medicine*, 2011, 8(20): 63-64.
- [3] Zheng Xiaoyu. *Guiding principles for clinical research of new Chinese medicines (trial)*. Beijing: China Medical Science and Technology Press, 2002: 57-61.
- [4] Liu Li, Niu Xinpeng. The effect of Gualoupi injection on vascular endothelial function of stable angina pectoris with phlegm and blood stasis syndrome. *Journal of Cardiovascular and Cerebrovascular Diseases of Integrated Traditional Chinese and Western Medicine*, 2014, 12(1): 3-5.
- [5] Liu Xiaohong, Li Liqi, Lu Weihua, etc. Intervention effects of plasma ET, MMP-9, hs-CRP, platelet aggregation rate and safflower yellow in patients with coronary heart disease. 2011, 09(9): 1036-1038.
- [6] Harred J F, Knight A R, McIntyre J S. Inventors. Dowchemicalcompany, assignee Xpo Xidtionprocess. *US Patent* 3. 2012, 3(17).1927~1904