GW25-e1597
Effects of Various Pressures of Enhanced External Counterpulsation on Endothelial Function in Patients with Coronary Artery Diseases
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Objectives: It has been proved that enhanced external counterpulsation (EECP) can be used as a noninvasive treatment of coronary artery disease (CAD). By applying external pressure on the lower trunk, EECP augmenting diastolic pressure and inducing collateral blood perfusion to the coronary system and promoting collateral circulation. More importantly, by speeding blood flow, enhancing shear stress, that protect and improve endothelium function so as to repress the development of artherosclerosis in the arteries. The current study was designed to investigate the effects on endothelial function in patients with CAD with various pressures apply to the patient’s body during EECP.

Methods: Shear stress in brachial arteries were calculated on different EECP cuff pressures by high frequency ultrasound in 21 persons. CAD patients were randomly assigned to non-EECP control group (n=48) and 3 groups of EECP with different cuff pressures: P0.025 group (P=0.025 Mpa/cm², n=28), P0.030 group (P=0.030 Mpa/cm², n=30), P0.035 group (P=0.035 Mpa/cm², n=29). Flow-mediated vasodilation (FMD) and nitroglycerin mediated dilatation (NMD) of brachial artery before and after the 36-hour EECP treatment were measured by high frequency ultrasound. At the same time points, blood ET-1 and hsCRP levels were also detected.

Results: No significant systolic shear stress (Ts) changes among the EECP cuff pressure groups (cuff pressure from 0.025 mmHg to 0.040 mmHg, P<0.05). There were significant changes of mean shear stress (Tm) and mean shear stresses (Tm) were increased correlated positively with different EECP cuff pressures (P<0.01). Compared with the pre-EECP state, FMD increased significantly in the three EECP groups (P<0.01), hsCRP decreased significantly in P0.035 group (P<0.05) only, ET-1 decreased in P0.035 group and P0.030 group (P<0.01) after the 36-hour EECP treatment. However, no changes of NMD were found in all three EECP groups (P>0.05) after 36-hour EECP treatment. When the extents of changes were compared among the EECP groups, the higher the pressure was applied, the more striking the changes observed. FMD increased, hsCRP decreased and ET-1 decreased considerably in P0.035 group compared to P0.025 group (P<0.01). It was also found that the change of ET-1 was more significant in P0.030 group than P0.025 group (P<0.05).

Conclusions: Increased EECP cuff pressure can accordingly raise the shear stress in brachial artery. EECP can improve endothelial cells function in patients with coronary artery disease. In comparison to lower pressure, higher pressure EECP is more effective to achieve the benefits.

GW25-e1657
The influence of combined exercise training on the blood lactate level of type 2 diabetes
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Objectives: The present study is to investigate the clinical significance of blood lactate level in type 2 diabetes and the effectiveness of aerobic training combined with resistance training therapy for type 2 diabetes. Methods: 80 type 2 diabetes outpatients with no complications and another 20 normal healthy people were recruited to observe the relationship between blood lactate level and type 2 diabetes. Then 38 of these 80 type 2 diabetes outpatients with no complications and another 20 normal healthy people were recruited to observe the relationship between blood lactate level and type 2 diabetes. Then 38 of these 80 type 2 diabetes outpatients were subdivided into two groups randomly: the conventional therapy group (N=48) and the advanced exercise therapy group (N=32). The conventional therapy includes regular medication plus the guidance of diet and exercise, while the advanced exercise therapy adds aerobic training combined with resistance training (8 weeks, 36 sessions in total) besides the conventional therapy. Each exercise session includes: aerobic training at an intensity of 60%-80% HRR (Heart Rate Reserve) lasting for 30-45 minutes (6 times/week during the first 4 weeks and 3 times/week during the last 4 weeks), and the following resistance training at the intensity of 50%-55% IR (Intense Rate) for 15-30 minutes (3 times/week during the last 4 weeks).

Results: (1) The Lac level of diabetic group was significantly higher than normal control group (P<0.01). (2) After the 8-week therapy, the FBG, HbA1c, Lac and IRI levels of both conventional therapy group and advanced exercise therapy group were significantly decreased (P<0.01). The FIN level of the advanced exercise group was significantly decreased (P<0.01) compared with the conventional exercise group, but no change in the conventional therapy group. (3) Furthermore, compared with the conventional therapy group, the declines of PBG, PIN, HbA1c, Lac and IRI levels were even bigger in the advanced group (P<0.01 or P<0.05).

Conclusions: (1) Blood lactate level could be used as a new clinical indicator for the type 2 diabetes. (2) The combined exercise training (aerobic training combined with resistance training) is recommended for type 2 diabetes.

GW25-e329
Research on the Effects of Exhaustive Swimming Mice' cardiac-pulmonary function after unified Supplements of HMB and Glutamine
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Objectives: The main effect of HMB is to increase lean body mass and muscle strength, the main function of glutamine is to resist fatigue. In order to explore the effects of HMB, glutamine in the different exercise load and whether unified combined supplements HMB and Glu are better for the body to recover, we designed this study to set animal model of swimming. After adaptability feed, all the mice swim 40min without weight loading two days a time(water temperature is 19°C, water depth is 15 cm, the pool diameter is 40 cm), in the second week swim 70min two days a time, in the third week swim 100 min and swim 110 min in the fourth week. For the waste gas, waste residue in addition to stir to ensure the physiological load of exercise, after that record the swimming time.

We pick eyeball to take 1ML blood, and then kill mice by dissolve the neck after swimming immediately, the blood is used to test routine blood and BUN level. Put the mice which are taken on the table on the stage to take the double calf leg muscle, liver, and the determination of the muscle of mouse malondialdehyde (MDA), superoxide dismutase (SOD), liver glycogen, and succinate dehydrogenase (SDH), blood BUN and other biochemical indicators. Use the single factor analysis of variance to compare HMB, glutamine supplement and single irri gation supplements HMB, glutamine differences in ability of aerobic exercise and anti-fatigue effect. Methods: We choose 40 clean and healthy running mice, and divide them 10 a group. After 2 weeks’adaptability feed, the mice are randomly divided into control group (NT), diet + HMB group (P0.025 kg weight HMB, HMB lavage daily), sport + glutamine group (2.7 g/kg body weight glutamine lavage daily), sport + HMB + glutamine group (0.45 g/kg body weight HMB weight +2.7 g/kg body weight glutamine lavage daily). All the mice weighed once a week to determine the weight, and observe the status of the mice. After the swimming training, all the mice swim 40min without weight loading two days a time, and record the swimming time.

We pick eyeball to take 1ML blood, and then kill mice by dissolve the neck after swimming immediately, the blood is used to test routine blood and BUN level. Put the mice which are taken on the table on the stage to take the double calf leg muscle, liver, and the determination of the muscle of mouse malondialdehyde (MDA), superoxide dismutase (SOD), liver glycogen, and succinate dehydrogenase (SDH), blood BUN and other biochemical indicators. Use the single factor analysis of variance to compare HMB, glutamine supplement and single irri gation supplements HMB, glutamine differences in ability of aerobic exercise and anti-fatigue effect. Results: After supplying four weeks, the results indicate that the mixed group’s weight, the swimming time of exhaustion, MDA, SOD, SDH, hepatic glycogen and BUN all have significant differences when comparing with the other groups (P<0.01). Meanwhile, the mixed group’s content of MDA in gastrocnemius and BUN in blood is the lest, and the content of SOD, SDH and hepatic glycogen are the most.

Conclusions: (1) Supplementary feeding glutamine alone, HMB and glutamine combined supplementary feeding can all significantly increase the weight of mice, with the HMB group’ weight were less than the control group, which may indicate that the effect of increasing weight is not obvious. (2) HMB have the best effect of prolonging the swimming time ,which may explain the relatively light weight, aerobic capacity is relatively strong. (3) HMB, Glu supplementary feeding mice either alone or combined, which all can significantly increase the glycogen content in mice. Meanwhile, sport + HMB alone and HMB, glutamine jointly feeding are quite similar. (5) HMB, Glu supplementary feeding mice either alone or combined, which all can significantly increase the content of SDH. Meanwhile, the joint feeding have the more obvious effect.

GW25-e5318
The research on changes of cardio-pulmonary function and antioxidation of lab rat caused by H5SB noise under different exercise stress training
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Objectives: With the development of urban modernization, noise has been regarded as a new major pollution in city with the wastewater, waste gas, waste residue in addition to hearing, its harmful aspects of the disease to human body also lead to fatigue of human physical and mental, physical decline, lack of concentration. In order to study the degree of noise on the human body and how to prevent and resist hazard of noise, this paper tries to research the antagonistic effect of the different exercise load towards noise and the possible impact of the mechanism from the perpective of changes of SOD, MDA, Adrenal morphology.

Methods: 63 healthy male Kunming lab rats (purchased in Animal Research Center of Tongji Medical College of Huzhou University of Science and Technology) whose average weight is 20.4 kg, were randomly divided into 7 groups, namely: control group (no exercise, no noise), exercise of small loads +105 dB noise stress group, exercise of moderate loads of +105 dB noise stress group, exercise of heavy loads +105 dB noise stress group, small load exercise group, medial load exercise group ,heavy load exercise group. All lab rats will be fed in different cages, nine rats per cage; kept in plastic feeding cage with a stainless steel cover, plastic water pipes and aluminum water pipes, under the feeding temperature of 10°C-15°C, the solid mixed feed with national standard , free diet. 6 weeks later, the lab rats in each group will be killed to observe the caused superoxide dismutase (SOD), malondialdehyde (MDA) content, and adrenal of lab rats will be got and fixed with 8% paraformaldehyde and then be treated the process of specimen-production, dyeing for observing morphological changes.