CARDIAC REHABILITATION

REHABILITATION FUNCTIONAL ASSESSMENT

GW27-e0503

Influence of regular physical trainings on tolerance indicators to the exercise stress and the clinical condition of patients with chronic heart failure

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OBJECTIVES To study influence of a complex of physical trainings on tolerance indicators to an exercise stress and a clinical condition of patients with the chronic heart failure (CHF).

METHODS 70 patients with the coronary heart disease (CHD) of the complicated CHF I-III FC are examined. Average age of patients 62,3+ 1,5 years. Patients were divided into 2 groups: 1 group - 35 patients CHF I of FC (15), the II FC (16), the III FC (4); The 2nd group - 35 patients CHF I of FC (13), the II FC (17), the III FC (5). Within 6 months both groups received standard basic therapy. 1 group in addition was engaged in the standard option of a complex of physical exercises which included morning exercises, training of an aerobic orientation in the form of the dosed walking.

RESULTS At patients I and II group with the II FC CHF it was noted decrease of a distance of the test of six-minute walking TSMW by 17,1% and 15,4% ($p < 0,01$) and the III FC CHF for 48% and 47,7% ($p < 0,001$) respectively in comparison with indicators of TSMW of patients with the I FC CHF. Also patients II and III FC CHF had the scale of an assessment of a clinical state (SACS) indicators authentically higher in comparison with indicators of patients with the I FC ($p < 0,001$). Against 6 months of treatment with including of a complex of physical trainings at patients of 1 group, it was noted: at patients of 1 group with the I FC CHF against treatment a score on a scale of SACS were enlarged by 50,7% ($p < 0,001$), and patients have II groups for 42,6% ($p < 0,001$); patients of 1 group from the II FC CHF for 41,8% ($p<0,001$), and at patients have II groups for 29,2% ($p < 0,001$); patients of 1 group from the III FC for 22,5% ($p < 0,001$), and at patients have II groups for 8,5% ($p < 0,005$), respectively, in comparison with initial indicators. At the same time the distance of TSMW was enlarged at patients from I, II and III FC of the first group by 13,1%, 14,5% and 16,6% ($p < 0,001$), at patients of the second group for 16,3%, 9,4% and 13% ($p < 0,005$), respectively.

CONCLUSIONS Patients CHF have a regular use of a complex of physical trainings, in the form of morning exercises and the dosed walking, promotes improvement of overall health, enlarges tolerance to exercise stresses, working capacity increases and leads to improvement of a clinical condition of patients.

GW27-e0536

Sodium Restriction Diet for Symptoms Improvement in Heart Failure: an Evidence-Based Case Report

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OBJECTIVES Heart failure is often considered as an international public health concern due to its increasing prevalence and direct health costs. The aims of HF therapy are to reduce mortality and morbidity, which includes relieving symptoms and signs and improving quality of life. Currently there is still a gap of evidence regarding sodium restriction diet as non-pharmacological and non-interventional therapy. The aim of this report is to perform a critical appraisal to analyze whether sodium restriction diet reduce the symptoms of heart failure compared to no restriction in the diet.

METHODS Comprehensive computer-based literature search was performed on January 30, 2016 using PubMed, EMBASE, and the Cochrane Library. All abstracts and title from the initial search results were screened, reviewed, and appraised using critical appraisal worksheets by Center of Evidence-Based Medicine, University of Oxford.

RESULTS Three RCTs met the inclusion criteria and were considered eligible for this case report. In patients with chronic heart failure, the median quality of life score after 6 months significantly increased in the low-sodium diet group. In addition, improvement in the primary merged endpoint which includes NYHA class and quality of life was seen in 51% of the patients in the sodium-restricted diet group. In contrast, in patients with acute decomplensated heart failiure, there were no significant differences in the change in clinical congestion score (CCS) from baseline to 3-day reassessment.

CONCLUSIONS In patients with chronic heart failure, quality of life improvement and NYHA class improvement were seen in patients with sodium-restricted diet.. Further research with larger sample size, strict allocation and blinding in intervention and control group, and extensive follow-up period are needed to establish a firm heart failure nutrition guideline.

GW27-e0560

Six-minute walking distance, but not systolic function, was predictor of adverse cardiac events in heart failure patients who underwent early exercise program

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OBJECTIVES This study identified determinants that could influence adverse cardiac events if patients with HF participated in exercise program (EP) early after rehospitalisation.

METHODS This was a part of a quasi-experimental study which consecutively recruited patients after hospitalisation of acute decompensated heart failure, with ejection fraction (EF) $< 40\%$, age < 65 years, resting heart rate < 100 bpm. Fourty eight subjects as the intervention group (IG) underwent supervised, three sessions per week, symptom-limited, low to moderate intensity EP early after hospitalisation, using ergocycle, walking or treadmill when possible beside usual care. Meanwhile, 65 consecutive patients with similar characteristic underwent usual care only as control group (CG). Major adverse cardiac events (MACEs) such as mortality, rehospitalisation, and clinical worsening of HF of both groups were recorded within first month.

RESULTS Both groups had similar baseline characteristics regarding demography, basic rhythm, ejection fraction (EF), cause of HF, comorbidities, HF prognosis-related laboratories, medications, and 6-minute walking (6MWT) distance. The EP was commenced at day 5.1 +/- 3.5 after hospital discharge by IG subjects. MACEs were experienced by 9 (18.8%) of IG subjects and by 26 (40%) of CG ($p = 0.016$). In the IG, 6MWT distance < 240 meters had adjusted RR 4.17 (95%CI: 1.08 - 16.04), $p=0.038$ for MACEs, but EF $< 21\%$ had RR 0.88 (95%CI: 0.24-3.27), $p=0.84$ for MACEs. But in the CG, 6MWT distance < 240 meters had RR 0.92 (95%CI: 0.45-1.89), $p=0.814$ for MACEs and EF $< 21\%$ had RR 2.35 (05%CI: 1.02-5.41), $p=0.045$ for MACEs.

CONCLUSIONS Six-minute walking distance less than 240 meters was predictor of MACEs for patients with who participated in early EP. Patients with HF with 6MWT distance < 240 meters at discharge should be considered carefully to participate in early EP. Meanwhile, Low EF was not a limitation for early participation in EP.

GW27-e1047

Clinical Significance of Respiratory Compensation During Exercise Testing in Cardiac Patients

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OBJECTIVES Ventilation (VE) increases almost linearly with the increase in CO2 output (VCO2) during incremental exercise testing.

This VE-VCO2 slope rises in parallel with the severity of heart failure. Usually, this slope becomes steeper just before peak exercise probably because of the respiratory compensation for lactic acidosis, and this point is called RC point. However, the RC point may not be identified in some patients. We evaluated whether the respiratory compensation during exercise testing has clinical significance in cardiac patients.

METHODS In total, 152 cardiac patients (66.7±5.4 years) whose gas exchange ratio (R) at peak exercise ranges from 1.10 to 1.20 were enrolled. We compared cardiopulmonary function between patients who showed RC point (n=118) and those without it (n=34).

RESULTS The R at peak exercise did not significantly differ between patients with RC point (1.15±0.03) and those without it (1.14±0.03). However, as compared to the patients without RC point, those with RC point had higher peak VO2 (20.2±5.3 vs 13.6±3.4 ml/min/kg, p<0.001), higher anaerobic threshold (12.4±3.2 vs 9.2±2.3 ml/min/kg, p<0.001), and lower VE-VCO2 slope (31.7±5.8 vs 37.8±9.6, p=0.001). BNP also tended to be lower in the patients with RC point (175.4±364.7 vs 327.9±381.1pg/ml, p = 0.077).

CONCLUSIONS The present findings suggest that the phenomenon of respiratory compensation during heavy exercise indicates better cardiopulmonary function in cardiac patients.

GW27-e1175

VO2/kg peak, Lowest VE/VCO2 and OUES of Cardiopulmonary Exercise Testing in Patients With Severe Pulmonary Hypertension

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OBJECTIVES To investigate the degree of decline in exercise capacity and ventilatory efficiency in patients with severe pulmonary hypertension (PH) and to aid in developing more effective rehabilitation programs.

METHODS This study was carried out in a cross-sectional observational way. From August 1st, 2014 to March 31st, 2016, this study recruited 15 patients with severe PH as the PH group, including 7 patients with idiopathic pulmonary arterial hypertension(IPAH), 6 PH patients associated with congenital heart disease (PH-CHD), 1 patients with chronic thromboembolic pulmonary hypertension(CTEPH) and 1 PH patients associated with rheumatic disease (PH-RHD). After consent and clearance of contraindications, PH group underwent right-heart catheterization, pulmonary function test (PFT) and performed the 6-min walk test and symptom-limited cardiopulmonary exercise testing (symptom-limited CPET). Twenty-three healthy subjects, matched by age, sex, and body size were used as controls, also had CPET and PFT measurements. Variables, including peak oxygen uptake per kilogram (peak VO2/kg), oxygen uptake efficiency slope (OUES) and percentages of their predicted values (peak VO2/kg of pred%,OUES %), end-tidal carbon dioxide partial pressure at anaerobic threshold (PETCO2@AT), lowest ventilation to carbon dioxide ratio (lowest VE/VCO2) were obtained. All data were computed with SPSS windows 13.0. Differences between two groups were compared using two independent samples t-test, with p less than 0.05 considered significant.

RESULTS No adverse events occurred during this study. Only one PH patient failed to reach anaerobic threshold. Exercise capacity, as measured by peak VO2/kg and peak VO2/kg of pred% (16.12±2.96 ml·kg-1·min-1 vs 29.03±6.26 ml·kg-1·min-1; 44.2±13.3% vs 87.1±21.1%, respectively, both p < 0.001) was markedly lower in PH group. Additionally, PH group had lower OUES, OUES%, PETCO2@AT and higher lowest VE/VCO2 (901.6±306.6 ml/min/L/min vs 2085.0±454.4 ml/min/L/min; 40.7±16.5% vs 95.3±22.4%; 26.5±4.2 mmHg vs 41.5±3.2 mmHg; 45.20±9.78 vs 27.15±3.31,respectively, all p < 0.001). No significant difference was found in breath reserve (BR%,42.1±13.1% vs 44.3±11.3%, p = 0.592).

CONCLUSIONS This study suggests that exercise capacity of patients with severe PH is severely impaired, and they have a high V/Q mismatch response during exercise which indicates their reduced ventilatory efficiency. Furthermore, from this study we learn that CPET as a common exercise function assessment tool, can offer a comprehensive evaluation for PH patients and may help us establish scientific rehabilitation programs.

Key words: Pulmonary Hypertension; Exercise capacity; ventilatory efficiency; Cardiopulmonary Exercise Testing

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Effects of Pulmonary Arterial Pressure on Exercise Capacity and Ventilatory Efficiency in Patients with Pulmonary Hypertension

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OBJECTIVES To compare the characteristics of exercise capacity and ventilatory efficiency between patients with severe pulmonary hypertension (SPH group) and with mild-moderate pulmonary hypertension (MMPH group), and to aid in providing the evidence for clinical diagnosis.

METHODS We retrospectively investigated the symptom-limited cardiopulmonary exercise test (CPET) with gas exchange measurements in totally 23 patients with confirmed PH. According to the results of right-heart catheterization, we divided patients into SPH group (n=15) and MMPH group (n=8). All subjects had also performed the 6-min walk test and the pulmonary function test (PFT). All data were computed with SPSS windows 13.0. Differences between two groups were compared using two independent samples t-test, with p less than 0.05 considered significant.

RESULTS The two groups had similar demographics and pulmonary function at baseline. No adverse cardiac event occurred during the study. Only one patient with SPH failed to reach anaerobic threshold (AT). Exercise capacity was lower in SPH group than in MMPH group with a significant difference when measured by peak oxygen uptake per kilogram (peak VO2/kg, 16.12±2.96 ml·kg-1·min-1 vs 20.76±4.16 ml·kg-1·min-1, p=0.005), peak VO2/kg of pred %(44.2±13.3% vs 56.9±9.0%, p=0.026), VO2 @AT/kg (12.49±2.24 ml·kg-1·min-1 vs 15.86±2.74 ml·kg-1·min-1, p=0.005) and VO2 @AT/kg of pred% (34.7±10.8% vs 43.4±3.9%, p=0.014). But no significant difference was found in 6-minute walk distance (6MWD, 491.2±63.3m vs 532.9±77.5m, p = 0.178). Although being statistically insignificant, the lowest VE/VCO2 and VE/VCO2 slope (45.2±9.8 vs 40.0±13.0, 48.9±12.4 vs 39.0±17.0, respectively, both p > 0.1) in SPH group were slightly higher than those in MMPH group. In addition, Statistically significant differences between SPH group and MMPH group were observed in oxygen uptake efficiency slope (OUES), OUES of pred% and end-tidal carbon dioxide partial pressure at anaerobic threshold-PETCO2@AT(901.6±;306.6 ml/min/L/min vs 1304.1±356.47ml/min/L/min, p=0.01; 40.7±16.5% vs 62.6±16.8%, p=0.007; 26.5±4.2 mmHg vs 31.8±7.5 mmHg, p=0.047, respectively).

CONCLUSIONS This study suggests that exercise capacity and ventilatory efficiency of patients with severe PH were more impaired than those of patients with mild-moderate pulmonary hypertension, approximately 50% of predicted normal. It is concluded that OUES and percentages of its predicted values are better physiological parameters in evaluating the gas exchange abnormality of patients with PH.

Key words: Pulmonary Hypertension; Exercise capacity; Ventilatory efficiency; Cardiopulmonary Exercise Testing

MEDICAL REHABILITATION OF CARDIOVASCULAR DISEASE

GW27-e0162

The survey Quality of life in cardiovascular patients after heart surgery

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OBJECTIVES It is predicted that 44/8% of deaths in 2030 from cardiovascular disease will be in Iran; Coronary artery bypass surgery is one of the most common surgical procedures for the treatment of heart disease that can improve cardiovascular symptoms, improve performance, reduce mortality and improve quality of life for patients. The aim of the present study was to determine the quality of life and factors related to it in cardiovascular patients after heart surgery.

METHODS This study was a descriptive cross-sectional one in which. 230 cardiovascular patients from Shiraz City hospitals randomly participated after heart surgery. The necessary data was collected through interview and SF-36 quality of life questionnaire, patients self-report, and referring to their own hospital records. The obtained data was analyzed by means of kolmogrov smirnov test, ANOVA and