can generate impairments on cardiac function, leading to functional decline and quality of life, with a negative impact on morbidity and mortality. The benefits of exercise training (ET) under these conditions have been demonstrated by numerous studies. However, there are still a few studies on the benefits of ET in AFp associated with HF.

Purpose: To evaluate the potential of ET in AFp patients with heart failure.

Methods: 32 men, age 53±6 years, with HF and AFp were randomly allocated to exercise training group (n=16, 33.1±3.6% to 39.1±3.2%, P<0.001) and a control group. The maximal oxygen consumption (VO2max) and minute ventilation of the production of carbon dioxide (VE/VO2 slope) was evaluated by cardiopulmonary exercise testing on cycloergometer. The quality of life was evaluated by Minnesota questionnaire. Exercise training was performed in 60-min sessions three times a week for 12 weeks. The exercise protocol consisted of 5 minutes of warm-up, 40 minutes of aerobic exercise on a cycloergometer, 15 minutes of resistance exercises and 5 minutes of calm back. The control group was advised to maintain as usual activities.

Results: Baseline characteristics were not different between groups. After 12 weeks, the exercise training group significantly modified the echocardiographic parameters, respiratory efficacy and quality of life in patients with AFp associated with HF. The exercise training improved cardiac structure and function, respiratory efficacy and quality of life of patients with AFp associated with HF. After the complete study period from 2005 to 2012. We divided patients in two groups. GROUP A: patients admitted only in hospitals for HF acute care, GROUP B: patients admitted at least once to a CR facility for an In-H-CRP.

Purpose: The aim of this study was to analyze, as primary outcome, the impact of the in-hospital cardiac rehabilitation program (In-H-CRP) on all-causes mortality in patients with HF, and the readmissions for all causes, as secondary outcome.

Methods: We analyzed, from the Lombardy regional healthcare system administrative database, the discharge forms of patients with HF-related diagnosis, recorded from 2000 to 2012. This included, among all data, the number of all in-hospital admissions, CR facility admissions, post-discharge deaths, outpatient drug prescriptions and outpatient visits. A 5-years period of freedom from hospitalizations was considered adequate for our study. We considered as "new" or "incident" HF cases, the patients at their first HF hospitalization, limiting the analysis period from 2005 to 2012. We divided patients in two groups. GROUP A: patients admitted only in hospitals for HF acute care, GROUP B: patients admitted at least once to a CR facility for an In-H-CRP.

Results: The sample study was represented by 140,552 "incident" HF cases. Of these patients 100,643 (71%) were in Group A, and 39,709 (29%) in Group B. A total of 1,216,000 intervention cases were included in Group A and 98,604 in Group B. The results showed that 30.6% of HF cases had a mean of 3.6±2.78 HF acute admissions before they referred to CR facility for an In-H-CRP. Male gender, females’ age and burden of comorbidities are significant higher among patients referred to a CR facility (p<0.001). Patients in Group B had a significantly higher number of intervention procedures (p<0.001) and had a significantly higher number of drug prescriptions and outpatient visits (p<0.001). Total mortality was 30% for group A and 29% for group B, but adjusting for different covariates, the risk of dying (Cox Model) was decreased by 43% for patients admitted to an In-H-CRP. The number of readmissions after the first event were 176,072 (84% of the total mortality with a mean of 2.59±2.21) in Group A and 98,449 (44% of the total with a mean of 3.43±3.03) in Group B (p<0.001). The risk of readmission was decreased by 31% for those patients who underwent to an In-H-CRP.

Conclusions: This population study provide evidence of a beneficial relationship between the use of Cardiac Rehabilitation program and the improved patient survival.

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P6061

Changes in exercise capacity of frailest patients with heart failure: comparison between standard exercise recommendations versus stroke volume response to exercise volume response to exercise: a pilot study

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Background: Peak exercise oxygen uptake (V O2peak) and exercise capacity are strong factors for predicting mortality in heart failure patients (HF). Although considered heterogeneous in the nature of exercise intolerance was found in HF patients, one third of them did not reach a central hemodynamic exercise limitation induced by the impairment to augment stroke volume (SV) during a cardiopulmonary exercise testing (CPET). Among the frailest HF subjects (V O2peak <18.0 mL min−1 kg−1), SV moreover reached its peak at a submaximal exercise level. This study aimed to compare the aerobic responses to exercise to those of non-frailest patients. In the frailest HF patients, the international guidelines recommended to prescribe moderate continuous intensity exercise (MICE) based on the heart rate value (HR) associated with the anaerobic threshold (VT1). However, the b-blockers interactions on ventilatory adaptations and the attenuated HR response to exercise generally observed in HF patients would induce a dissociation between VT1 and PSVmax. This might be taken into consideration for the exercise intensity prescription.

Purpose: The aims of the study were, in HF patients: 1) to examine whether VT1 is concomitant with PSVmax, 2) to compare the effects of 4 weeks of exercise cardiac rehabilitation based on VT1 or PSVmax on cardiorespiratory responses.

Methods: Twelve HF patients (V O2peak: 15.7±3.6 mL min−1 kg−1) performed a CPET with respiratory gas analysis and simultaneous assessment of SV using a thoracic impedance method, before and after an exercise-based cardiac rehabilitation. Maximal tolerated power (MTP), V O2peak and VT1 were determined in accordance with the international standards. Peak SV values and PSVmax were estimated by a third-order curvilinear regression method. During 4 weeks, all subjects performed, 5 times per week, 20-50-min cycling exercise at the power associated to VT1 (GVT1, n=6) or PSVmax (GpsVmax, n=6). Exercise session duration was regulated to maintain similar training load between both groups using session rating of perceived exertion.

Results: Baseline medication, anthropometric and exercise characteristics did not differ between groups. For all HF patients, PSVmax was lower than VT1 before (60.3±12.6 vs. 63.6±14.5 w, p<0.004) and after (73.3±18.9 vs. 76.0±19.6 w, p<0.002) training. MICE based on VT1 did not modify PSVmax (p=0.54), but 2 days of HF intervention for GVT1 patients. In contrast, in the frailest HF patients, the international guidelines recommended to prescribe moderate continuous intensity exercise (MICE) based on the heart rate value (HR) associated with the anaerobic threshold (VT1). However, the b-blockers interactions on ventilatory adaptations and the attenuated HR response to exercise generally observed in HF patients would induce a dissociation between VT1 and PSVmax. This might be taken into consideration for the exercise intensity prescription.

Conclusion: Changes in V O2peak with training suggested a greater effect of MICE based on VT1 as compared to GpsVmax. Further investigation is required to confirm our results and the interest of SV monitoring in order to prescribe exercise intensity in heart failure.

P6062

A single session of exercise training stimulates the mobilization of endothelial progenitor cells in patients with chronic heart failure

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Introduction: Heart failure (HF) deteriorates the vascular endothelium. Exercise has been shown to stimulate the mobilization of endothelial progenitor cells (EPCs) which are used as an index of vascular endothelial function. EPCs contribute to the regeneration of the inflammatory endothelium and promote neovascularization.

Purpose: The purpose of the present study was to evaluate the effect of a single session of exercise training on the vascular endothelial function in patients with chronic HF.

Methods: Thirty six patients (30 males, 6 females) with stable chronic HF (mean ± SD. Age [years]; 55±10, EF [%]; 31±9, VO2peak [ml/kg/min]; 17.7±4) underwent a symptom limited maximal cardiopulmonary exercise test (CPET) on a cycle ergometer. Venous blood was sampled twice, once before CPET and at the end of CPET. Four different cellular populations (2 subgroups of EPCs and 2 subgroups of circulating endothelial cells, CECs) were quantified by flow...
cytometry; these populations were defined as CD34+/CD45−/CD133+, CD34+/CD45−/CD133+/VEGFR2, CD34+/CD45−/CD133−/CD34+ and CD45−/CD133−/VEGFR2. Results: As expressed in median (25th, 75th percentiles). Results: An increase in three or four out of cellular populations was observed (p < 0.05). CD34+/CD45−/CD133+ increased from 24 (20,45) to 39 (31,55) cells/1 million mononuclear cells. All patients had CD34+/CD45−/CD133−/VEGFR2 from 3 (1,5) to 6 (2,12) cells/1 million enucleated cells and CD34+/CD45−/CD133−/VEGFR2 from 3 (1,4) to 8 (3,12) cells/1 million enucleated cells. There was no statistically significant difference observed for the CD34+/CD45−/CD133− subgroup (p = 0.23). Conclusions: A single session of exercise training stimulates the mobilization of EPCs in patients with chronic HF. The clinical relevance of these findings on the endothelial function needs further investigation.

P6063 Influence of full yogic breathing on long-term outcomes in patients with chronic heart failure
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Background/Introduction: Moderate-intensity breathing techniques have been successfully used in patients with chronic heart failure (CHF) to reduce the pulmonary congestion symptoms and to increase the exercise tolerance. However, their impact on long-term outcomes in CHF remains unclear.

Objectives: To assess the influence of a full yogic breathing on long-term outcomes in patients with CHF.

Methods: The study included 130 patients (mean age 65±5.7 years) hospitalized for acute compensated CHF with reduced left ventricular ejection fraction (LVEF <40%). All patients were divided into two groups: 66 patients received only standard therapy of CHF (angiotensin-converting enzyme inhibitor, β-blockers, aldosterone antagonists, digoxin, loop diuretics) and 64 ones additionally practiced the full yogic breathing during all hospitalization period and then the next 12 months after discharge. The primary outcome was a composite of rehospitalization for CHF and/or all-cause mortality. The secondary endpoint included changes in NYHA class of CHF.

Results: Over a median follow-up of 12 (11–14) months, the primary endpoint occurred in 45.5% of patients who were treated with only standard therapy and in 12.5% of patients who practiced the full yogic breathing (odd ratio (OR) 0.17, 95% confidence interval (CI) 0.07–0.41). The frequency of rehospitalization for CHF was significantly lower in breathing group compared to control (3.1% versus 24.3%, OR 0.1, 95% CI 0.03–0.46). No difference was found in all-cause mortality between both groups. At the end of follow-up period the improvement of NYHA class was revealed in 31.3% of patients in breathing group and in only 12.1% of patients in control group (OR 0.3, 95% CI 0.12–0.75). After adjustment for significant covariates in Cox regression models, full yogic breathing practice was an independent predictor of reduction of the risk of rehospitalization for CHF (OR 0.1, 95% CI 0.05–0.38) and improvement of NYHA class (OR 0.26, 95% CI 0.13–0.68).

Conclusion: In CHF patients full yogic breathing practice during 12 months in addition to standard therapy is associated with a significant reduction of the risk of rehospitalization and improvement of NYHA class of CHF.

PLATELETS

P6064 Acetyl-coa carboxylase regulates platelet lipid content in coronary artery disease patients
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Background: Acetyl-CoA carboxylase (ACC) is the first committed enzyme for the de novo lipid biosynthesis pathway. In human platelets, thrombin is the major agonist responsible for ACC phosphorylation (P-ACC), resulting in its inhibition. ACC phosphorylation is increased in high-risk patients with coronary artery disease (CAD). Knowing that ACC activation/inhibition on platelet lipid content in the setting of CAD should be explored.

Aims: The aim of the study was to investigate, by a quantitative lipidomic approach, the impact of ACC inhibition on platelet lipid content in CAD patients.

Methods: Out of the 188 consecutive patients included in the ACCTHEROMA study for platelet P-ACC analysis, lipid extracts from platelets of 31 patients were subjected to direct infusion-tandem mass spectrometry for the lipidomic study. Results: In circulating platelets of CAD patients, quantitative lipidomics detected 86 lipid species belonging to 11 lipid classes. We showed that diabetes and more importantly plasma triglyceride levels were both independently associated with an up-regulation of intraplatelet triglyceride (TAG) lipid species. In contrast, high platelet P-ACC was associated with a down-regulation of 13.5% (66/490)

members of TAG lipid species. Accordingly, lipid class enrichment analysis confirmed a strong association between platelet P-ACC and down-regulation of lipid species in TAG class (OR: 27.0, 95% CI: 7.1–228.3, p = 0.001). Further characterization of fatty acid chain constituents of TAGs identified down-regulation of fatty acid chains containing 12–18 carbons and more importantly C14.0 (myristic acid)–containing TAGs.

Conclusions: Lipidomic profiling of circulating platelets, our study highlights, for the first time, the contribution of endogenous lipogenesis on platelet lipid content.

P6065 Functional characterization of human reticulated platelets by cell sorting
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Background: Reticulated platelets (RP) are a fraction of the platelet pool, representing the youngest platelets released from the bone marrow. Several studies have shown an association of RP levels and cardiovascular events or mortality.

Purpose: The current study sought to investigate qualitative differences of young RNA-rich versus older RNA-low platelets in order to determine potential causes for their specific properties.

Methods: Washed platelets from three healthy donors were stained with a highly specific nucleic acid and biotin fluorescent dye. Platelets were sorted by two gates representing the 20% of platelets with highest staining intensity (RNA-rich platelets) and the 20% of platelets with lowest staining intensity (RNA-low platelets). RNA-seq was performed by Illumina® technology. Fixed sorted platelets were visualized by electron microscopy (EM). Expression of surface activation marker P-selectin was measured after incubation w/o/w 20μM ADP by FACS in sorted RNA-low and RNA-rich platelets from 6 patients on clopidogrel, 6 patients on prasugrel and 6 healthy subjects.

Results: Quantity measurement resulted in a median RNA amount of 0.52 [IQR 0.33–0.68] fg per platelet in RNA-low platelets and 1.04 [0.67–1.15] fg per platelet in RNA-rich platelets. RNA sequencing revealed 131 significantly enriched genes in RNA-rich platelets (adjusted p < 0.05 FDR) and 78 enriched genes in RNA-low platelets. Gene ontology analysis yielded 36 GO-terms for genes with increased expression in RNA-rich platelets – particularly genes which are responsible for platelet reactivity, shape change, clotting and cell-cell-interactions (e.g. DMTN, SELP, ITGA2B, ITGB3). EM-visualization of sorted platelets revealed no relevant activation or degranulation and confirmed a greater cell volume and a higher amount of intracellular granules in RP. Several RNA-rich platelets showed a Golgi-apparatus and rough endoplasmic reticulum. ADP-stimulated P-selectin expression indicated a significant difference in healthy donors between RNA-low (13.1 [9.39–15.43]%) and RNA-rich platelets (23.9 [17.22–26.20]%, p < 0.01), which was absent in platelets from patients exposed to clopidogrel and prasugrel.

Conclusion: RNA-sequencing of RNA-low and RNA-rich platelets indicated noticeable changes in transcripts of proteins-coding genes. Especially genes and gene clusters involved in platelet reactivity are enriched in RP. Thus, the increased activity of RNA-rich platelets is reflected in their transcriptome. Visualization by EM showed rough endoplasmic reticulum containing ribosomes, which is indispensable for protein biosynthesis in mammalian cells but rarely seen in platelets. This suggests that RP are capable of synthesizing new proteins in absence of a nucleus. The distinct transcriptome of RP suggests that synthesized proteins might be involved in clotting and platelet-reactivity. Surface activation marker P-selectin in RNA-low and RNA-rich platelets supports this hypothesis.