was specially improved in the 4 PAH group. Uncontrolled design and retrospective analysis are serious limitations.

Conclusion: Supervised training as add-on medical therapy was feasible for treated in patients with PH in NYHA II-IV class in a cardiac rehabilitation center without serious adverse events and with measurable benefits. Multicentric randomized controlled trials are needed to confirm safety on right ventricular function and long-term benefits in patients with PH.

January, 18th, Saturday 2014

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Effect of constant power vs. dynamic exercise with fixed heart rate on the VO2 and stroke volume responses in trained adolescents.

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Background: The purpose of this study was to compare the responses of oxygen uptake (VO2) and stroke volume (SV) in exhaustive exercises performed at a constant workload or at heart rate steady-state.

Methods: Nine well-trained children performed an incremental exercise test on a cycle ergometer to determine the maximal power associated with VO2max (pVO2max) and the power inducing SVmax (pSVmax). Two days later, they performed two continuous exercises at pSVmax (tlim@pSVmax=10min16s±6min41s) and at a heart rate steady-state associated with SVmax (tlim@HR@SVmax=21min04s±13min20s; P<0.05). Heart rate (HR) and SV were continuously measured by impedance. Cardiac output (CO) and arteriovenous O2 difference (a-vO2diff) were calculated using standard equations. New software allowed an automatic workload control to maintain HR target value.

Results: Statistical analysis indicated that 1) maximal blood lactate, COmax and VO2max values were not different between the three exercises, but SV was higher and HR was lower in tlim@HR@SVmax (112±46 mL·bat·1 and 192±9 bat·min-1) than in the incremental test (106±44 mL·bat·1 and 197±6 bat·min-1; P=0.05) and tlim@SVmax (102±40 mL·bat-1 and 196±7 bat·min-1; P=0.05); 2) at the end of exercise, HR, SV and VO2 significantly fell in tlim@HR@SVmax and in tlim@pSVmax (P<0.05) and 3) the time to reach SVmax is slightly correlated with the time to exhaustion at pSVmax (R=0.61, P=0.08) compared to one at HR@SVmax test (R=0.70, P=0.03).

Conclusion: According to the exercise modalities, the interactive effects of increased HR or SV are responsible of the VO2max attainment during exhaustive exercise.

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Utility of research the dispersion of QT and QTc intervals in adolescent athlete

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Background: Heart rhythm disorders, often severe, occurring with an increased incidence in adolescent athlete and requires identification of risk factors, especially by precompetitive screening, for the purpose of prevention. Objective: to evaluate the QT interval dispersion in adolescent athletes

Methods: Subjects: 51 sporting teenagers (14-17 years old): *first lot: 25 endurance-trained athletes (runners, football-players) and the 2nd lot: 26 strength-trained athletes (wrestlers, boxers). Control lot: 20 teenagers, the same age, without any sign of cardiac suffering. ECGs were assessed on all the patients and control, and used to calculate QT interval in three successive cardiac ECG cycles, the QT interval dispersion (QTd) (the difference between maximum and minimum value of QT interval) and the QTc interval dispersion (QTcD) (Bazett’s formula). The echocardiography was performed in all cases for highlighting of characteristic changes of athlete’s heart.

Results: The average values of QTd and QTcD in the 1st and 2nd group were superior than the values in the control group but the difference is not statistic significant. I lot: QTd: 43.54±21.03 msec; QTcD: 50.81±19.34 msec; II lot QTd: 48.23±12.56 msec; QTcD: 53.59±17.21 msec; control lot:QTd: 35.88±10.22 msec; QTcD: 39.23±14.81 msec. The highest values of QTd were found in strength-trained sporting teenagers from the second lot that it might be possible to have a higher ventricular arrhythmia risk. There wasn’t any case with QT and QTc interval value longer than the normal in control group. Increased QT and QTc intervals dispersion were significantly correlated with the presence of cardiac morphological changes at echocardiography

Conclusions: At side of other parameters ECG, it is useful research screening of the QT and QTc intervals dispersion during periodic controls at adolescent athletes, like indicator of the risk of the ventricular arrhythmias, as a useful measure of prevention

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A task force of the French Underwater Federation (FFESSM – Fédération Française d’Etudes et de Sports Sous-Marins) sought to issue guidelines in order to allow patients with hypertension to be fit to dive after a careful evaluation. Like any physical activity, underwater activities increase blood pressure with significant variations related to mental stress, cold and, specifically, hyperoxia. Patients with hypertension are more prone to these changes because hypertension is a disease of vasomotion with potential visceral sequelae. They may thus be more subject to sudden death or immersion pulmonary edema.

When evaluating a hypertensive diver, the physician should be particularly careful if other risk factors, pathologic state or end organ damage (cardiac, renal, cerebral, retinal) is present. Management of hypertension must be consistent with current guidelines. For treatment, ACE inhibitors or ARBs are preferred for their good tolerability, with particular caution for the risk of dehydration with diuretics. Beta-blockers should only be used when necessary and are subject to specific conditions.

There will be no restrictions for asymptomatic patients whose BP is controlled (< 140/90 mmHg). We may require special conditions of practice for high risk or uncontrolled subjects (no cold water diving, limited to 30 m and no enriched oxygen mixture) or extend the temporary contraindication if BP is not controlled (> 160/100 mmHg). All hypertensive divers should receive specific information and a form is dedicated for this purpose.

These recommendations have been established according to ACC/AHA/ESC Guidelines for physical activities and competitive sports.