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EVENTS IN THE DEVELOPMENT RESPIRATORY AND CARDIOVASCULAR AEROBE PROCESS FOR STUDENTS IN "NAVAL ACADEMY"

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Abstract: *Aerobic training has been demonstrate to have an effect on the heart and its functions(decreased resting heart, increase stroke volume at rest and during exercises, increased cardiac output during maximum exercise, increase size of the heart, improved coronary circulation).*
Keywords: *Heart rate after effort, Frequency heart, Blood pressure in an effort to force, Respiratory volume*

INTRODUCTION

Aerobic training has been demonstrate to have an effect on the heart and its functions(decreased resting heart, increase stroke volume at rest and during exercises, increased cardiac output during maximum exercise, increase size of the heart, improved coronary circulation).
A re-examination of table above, shows that the increased SV and decreased HR in the trained, resting students still produces a CO equal to that of a comparably sized, untrained, resting person. Also, although the max heart rates of the two types of students are the same at maximum exercise (because the theoretical MHR is determinate by age alone), the trained individual has a higher CO because of his higher SV. I fall other things are equal, a person with a higher cardiac output should be able to exercise at a more intense workload than other individuals with a lower cardiac output

RESPIRATORY FERVENCIES

The effect of exercise-induced energy savings is slow breathing respectively low values of respiratory rate at rest in trained subjects compared with untrained. This is evidenced by values of 8-10 breaths b / min athletes. Slow breathing is possible due to respiratory muscle development and growth thoracic-pulmonary elasticity elements, for mobilizing a large volume of air with each breath. The effort, oxygen debt is repaid by a smaller number of breaths, but amplitude increased, also is faster recovery after exercise in subjects trained. In sub maximal effort, respiratory is low, reflecting increased lung efficiency. The maximal effort developed respiratory and power is higher in trained subjects compared to untrained

Amplitude breaths

Respiratory amplitude increases 6-7 times to rest in trained athletes (50-60% of vital capacity). Effort in the beginning, trained subjects respond faster metabolic needs, to, increased respiratory rate increases, especially due Current volume than the respiratory rate. On the one hand, the amplitude increased dead space ventilation facilitates in favor of alveolar supplied with fresh air ventilation, on the other hand, ventilation reduces energy costs for the same effort. Increased respiration amplitude acquired by training, is explained by the development of thoracic and abdominal muscles involved in breathing.

Respiratory volume

If the sub maximal effort, and the equivalent volume of air ventilated respiratory sensitive to the level of training decreases in maximal respiratory effort is obviously improved. Depending on the type of effort and level of training, R.V. can move from respiratory 120l/min. to 150l/min. in maximum effort. The increase in respiratory frequency and maximal effort are two factors responsible for this increase ventilation. Maximal respiratory flow, with high, will allow very high maximal oxygen consumption (VO2 max.) in trained athletes, particularly in lessons cardio respiratory endurance development.

Respiratory quotient

Is defined as the ratio of the carbon dioxide and oxygen metabolism, resulting from metabolic degradation consumed. Produce aerobic respiratory quotient decreases in sub maximal effort, both in absolute and relative (CR = 1 means carbohydrate oxidation, CR = 0.7 when burning fat and CR = 0.8 when catabolism protein). This adaptation, result in a better utilization of fatty acids effort, avoiding muscle glycogen storage. In an effort maximal respiratory quotient, the trained subjects increased. Evidence of increased capacity to perform intense work.

Maximal exercise oxygen consumption

It is perceived as the best indicator of cardio respiratory fitness in endurance effort, is the aerobic exercise capacity. After long practice of aerobic exercise, VO2 max increased substantially. After 6 months of training with 3 lessons per week of 30 minutes at an intensity of 50% VO2 max., Reached values of 50-60 ml / kg / min. Aerobic exercise improves VO2 max, but equally important is the increase in training athletes the possibility to work at as high a percentage of VO2 max. Trained athlete can maintain this intensity 8-10min.

Vital capacity

Known as unsportsmanlike, vital capacity is 3000-4000 ml values (values depend on height, weight, sex).
Values are improved by training, but increases vital capacity is explained rather by: hypertrophy of respiratory muscles (intercostals muscles to breath chest and diaphragm type for the abdominal type) and thoracic-pulmonary elasticity elements. In a study of 45 first year students from the Navy, showed an average vital capacity of 5100 ml. Morphologic functional improvements and respiratory system are evident in efforts to promote resistance allows full or partial remove respiratory problems encountered in athletes untrained (dead point). Neutral is a respiratory problem that occurs during exercise in untrained subjects that are installed progressively in the first Effort (between 30 sec and 6 min of exercise). Causes of this mechanism are due to:
- Insufficient supply of oxygen to active muscles, Neviot work due to energy anaerobic lactic acid production (local effects of lactic acid would affect muscle contractility, local fatigue);
- Muscular imbalance between work time and ability to autonomic system, which regulates breathing and blood circulation necessary muscle activity;
- Inadequate heating, this reduces time to adapt to large functions.

AEROBIC CARDIOVASCULAR EVENTS IN THE DEVELOPMENT PROCESS

Frequency heart

It reflects the labor performed by the heart to meet the demands imposed by exercise. The heart rate at rest effortlessly transition. Debit heart and cardiac frequency increase during the first seconds of effort. If effort is made to power constant and below lactate accumulation after 2-3 min to obtain a set of frequency heart and cardiac output, oxygen consumption similar**.**

Exercise heart rate

During exercise, heart rate Increases with intensity. Intensity is express by oxygen consumption is directly proportional. Expressing such intensity I, can compare results obtained by different Subjects or the same subject at different times.

Maximum heart rate

Is the most elevated heart rate that can be achieved in an exhaustive effort. Maximum heart rate is reached when the subject is close to exhaustion, when heart rate is capped.
Can be calculated by the formula FC FC max max = 220 - age (years).
It is known (according to Fick's equation) that heart rate increases oxygen consumption until FC is maximal and this happens when reached maximal oxygen consumption. So achieve FC max., Is one of to reach VO2 max criteria.
In an effort constant intensity (50 to 80% of VO2 max) after 3-4 min of exercise in untrained and trained 1-2 min, heart rate recorded a plateau, a steady state, as oxygen consumption otherwise (steady-state). If exercise intensity increases gradually after 1-2 min FC reaches a new plateau at each level of effort. The effort is more intense, the adjustment period is necessary to stabilize higher.

Intermittent exercise heart rate

If a batch type effort "interval training", the report, between effort during rehearsals with high power and low power will depend on the evolution of heart rate is maintained until the end of lesson preparation. This type of training, intermittent, maximal cardiac output improvement is effective because lactic acid is avoided.

Prolonged exercise heart rate

Efforts with longer, an hour and a lower intensity onset of lactate accumulation, cardiac Debit stabilizes. Thus, a run that requires a cardiac output of 15 liters per min. for 14 min., with a CF of 130 b / min., in the race (3000 m), cardiac output is 15 liters per min., but heart rate of 160 b / min and stroke volume of 90 ml per b. So, after a long-term effort with a low intensity onset of lactic acid accumulation, cardiac output is stable, despite the fact that stroke volume decreases progressively. Heart rate during exercise is growing to Mantini constant cardiac output.

Heart rate after effort

Returning after a short and intense effort or low intensity, is generally faster. The speed of recovery varies from one individual to another and the degree of endurance training. The difference lies in the fact that the same absolute power application, trained athlete has a lower FC untrained and recovery is faster.
Returning after a long effort Dewar (one hour), and it is made slower due to increased domestic in temperature, which is more pronounced if the effort is carried out in hot and humid environment. Heart rate is an important indicator for assessing body solicitation effort. This indicator gives the relationship and the degree of recovery of the body after exercise. Body recover after exercise, is calculated Dorgo index (P1 + P2 + P3 + P4) -300/10

Systolic volume

Systolic volume increases in effort. This growth is realized at an intensity of 40-60% effort from maximum possibility, then caps, stabilize, even if the effort and intensity continues to increase intensity. In this situation, cardiac output continues to rise, but only at the expense frequency heart. So systolic volume, reaches maximum intensity sub maximal effort.
A special situation is encountered in swimming effort when elongated body position makes effort to increase stroke volume by 20-40% compared to just rest in sitting position.
In supine venous return of blood to the heart is facilitated, which explains the increased stroke volume from standing position.

Cardiac output

Increased heart rate and stroke volume in the effort, produce and increase cardiac output. In relation to the rest, a larger volume of blood is sent heart into the systemic circulation. These adaptations allow the tissues to a sending large amount of nutrients and oxygen, in parallel, eliminating excess waste arising catabolic stress.

Blood pressure

Exercises that require large muscle groups (endurance efforts) causes significant increases in blood pressure max. up to 200 mm. hg.
Diastolic blood pressure increases in effort, with more than 15 mm Hg is considered abnormal and requires stopping effort.
At sub maximal exercise, systolic blood pressure increases progressive then reaches an equilibrium level. If the effort is prolonged, systolic blood pressure may decrease slightly, while diastolic unchanged.
Slight decrease in blood pressure in prolonged sub maximal effort is considered normal and is due to the decrease in peripheral resistance arterioles active muscles.

Blood pressure in an effort to force

In this type of effort is typical Valsalva maneuver, which consists of a prolonged apnea. Increase in thoracic pressure, increases blood pressure in the body to overcome high pressure in the chest cavity.
Blood pressure increases for the same effort differently depending on body segments required.
The different behavior of blood pressure according to segments that provide effort, has important consequences on the heart level. Myocardial oxygen consumption, blood Debit as the myocardium are related directly proportional to the product of heart rate and systolic blood pressure. Therefore, any static or dynamic effort made with hands, product and labor greatly increases heart.

Velocity

Blood velocity increases effort almost 3 times. It is known fact that blood flow is made complete in 21 sec. versus anaerobic efforts when it occurs in 7 sec.
Under conditions of intense effort, heart, muscles and skin skeletal receive much larger amounts of blood, thus increasing local circulation flow. This is explained on one hand by moving a large part of the volume of blood to organs hyperactive and secondly by increasing velocity.
Increase aerobic or anaerobic exercise capacity, it is possible to measure those improvements occur functional, structural, dimensional, to ensure increased amount of energy released per unit time. The primary means for ACHIEVING these changes is repeated exercise.

CONCLUSION

In physical education lessons, well learned exercises apply to complex forms, additional tasks associated with a pronounced practical orientation, creating the prerequisites for their application in practice in daily life conditions and professional training. Driving skills of students overall progress during training in school. But in some years, the pace of development of some of them becomes oscillatory character. This oscillation is conditioned primarily by natural laws concerning changes forms and functions of the body at different stages of growth and maturation. The size and orientation of these changes, in many respects depend on living conditions, the general arrangements for business students and the methodology of development qualities exercised their driving.

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