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The Cardiovascular System
Adaptation to Physical Load in Scholars of Industrial Region

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The Cardiovascular System Adaptation to Physical Load in Scholars of Industrial Region

Backgrounds

• 13 sudden deaths during last 6 years in Ukraine on physical training classes

  //ru.tsn.ua, 2013

• Cardiovascular diseases are the reason of 4,3 million deaths in Europe each year and more than 2 million in EU countries, which are 48% and 42% correspondently in all death cases

Backgrounds

- In Ukraine the highest rate of smoking teenagers among European countries
  
  Ministry of Health care, Ukraine, 2007

- For 16% people in Europe 10 minutes walk is difficult physical exertion
Methods

1. Physical load test according to Ukrainian National Recommendations (correspondent to Ruffier test) – assessment of heart rate (HR) and blood pressure (BP) at rest, after physical load and on the third minute after test
2. Statistics
Population

699 scholars

320 girls

379 boys

Age (mean ±1 SD) \(13.12 \pm 2.21\) years
Height (mean ±1 SD) \(160.3 \pm 12.7\) cm
Weight (mean ±1 SD) \(50.48 \pm 13.57\) kg
BMI (mean ±1 SD) \(19.34 \pm 3.50\)
Physical development mostly in range of median ±1 SD

p > 0.05
BMI > 85 percentile: 95 % CI = 12.04 - 17.96 %

Retardation in 5.1± 1.82 % (95 % CI) vs. Acceleration in 13.2± 2.81 % (95 % CI)
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Results

Vital signs during the test

- Baseline
- After load
- Restoration period

HR: Heart Rate
SBP: Systolic Blood Pressure
DBP: Diastolic Blood Pressure
Results

HR
- baseline: higher in girls (p<0.01)
- after load: no gender difference
- restoration period: no gender difference (p=0.09)

SBP
- baseline: no gender difference (p=0.12)
- after load: no gender difference
- restoration period: better decrease in boys (p=0.04)

DBP
- baseline: higher in girls (p<0.01)
- after load: no gender difference
- restoration period: better decrease in boys (p=0.01)
Results

CVS functional adaptation in population

- Excellent: 28.8%
- Good: 24.03%
- Average: 29.2%
- Poor: 8.59%
- Very poor: 9.38%
Conclusions

• Cardiovascular system adaptation in scholars is connected with anthropometry (height, BMI), baseline levels of vital signs and also sex.

• Low baseline level of BP and HR are associated with excessive increasing and poor decreasing of vital signs in restoration period.

• Poor test results are associated with overweight and increased baseline level of BP.
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