

CARDIOPULMONARY ADAPTATION TO SUBMAXIMAL BICYCLE EXERCISE OF YOUNG HEALTHY ADULTS

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Introduction: Exercise tests are important to quantify the physical capacity in the presence as well as in the absence of disease. Contemporary reference values for submaximal bicycle exercise of young adults under 25 years are not available in the literature. The aim of the study was to collect new reference values for submaximal bicycle exercise of young adults and proof the linear response of these values in an aerobic metabolic range between 0.4 and 2.0 watts/kg body weight. **Material and Methods:** A group of 140 healthy subjects (n=75 females, 22.6 ± 2.7 years; n=75 males, 22.7 ± 2.2 years) performed bicycle exercise at rest and under steady state conditions with 30, 60, 90, 120 and 150 watts (only males) with a duration of 5 minutes for each step. All measurements were performed on a bicycle ergometer in a half-sitting position. **Results:** Heart rate, arterial pressure, ventilation, O₂-uptake, CO₂-production, energy consumption and other respiratory and cardiovascular parameters in the range between 0.4 - 2.0 watts/kg were linearly correlated to external work load in males and females: e.g. heart rate (fC= 0.696x + 83,85, r = 0.99 males; fC= 0.527x + 0.78,93, r = 0.99 females), ventilation (V'E= 0.279x + 8,65, r = 0.99 males; fC= 0.230x + 10,51, r = 0.99 females) and oxygen uptake (V'O₂ = 0.0104x + 0.408, r = 0.99 males; V'O₂ = 0.0098x + 0.350, r = 0.99 females). **Conclusions:** The adaptation of respiratory and cardiovascular parameters for young and healthy subjects to submaximal exercise could be described and confirmed by linear regression lines, which indicate the linear response of these values in an aerobic metabolic range between 0.4 and 2.0 watts/kg body weight.