Young road cyclists physiological qualities
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Performance in adult road cycling depends on maximal aerobic capacity (VO2max), the ability to sustain a high percentage of VO2max over time and on explosive power characteristics. Few data are available on young cyclists and this lack of information could negatively influence the training methodology at this age. Therefore the purpose of this study is to verify if adolescent road cyclists have the same physiological qualities of adult cyclists and, moreover, which one of these qualities are enhanced (and therefore required) by the agonistic activity. To this extent explosive muscular power and aerobic qualities have been monitored during a competitive season in a group of adolescent road cyclists.

We measured in a group of 11 adolescent male cyclists different physiological variables three times during the competitive season: explosive power/velocity curve (P/V curve), VO2max, efficiency (Ef), blood lactate/power curve to calculate the power at 2.3.4 mM (W 2.3.4 mM). No significant changes were detected in all the studied parameters (muscular explosive power, VO2max, Ef, W 2.3.4 mM) during the competitive season. However it should be considered that the behaviour of explosive power and aerobic qualities (VO2max and so called anaerobic threshold) shows a different pattern. Explosive power decreases immediately at the beginning of the season, while it does not change since the middle of the season to the end; the opposite it seems to happen for the anaerobic threshold. These preliminary results on adolescent cyclists demonstrate that they possess lower explosive muscular power qualities if compared with elite adult cyclists. Such a difference can be easily explained by their minor muscular development. This quality decreases during the competitive season. Despite the lower amount of training and race adolescent cyclists perform during a competitive season, they possess comparable aerobic characteristics with elite adult cyclists. These qualities are maintained during the whole competitive season. For these reasons aerobic metabolism seem to be the principle limiting factor in young cyclists.

Keywords: cycling, limiting factors, adolescents

The effects of varying cadence on sub-maximal heart rate, blood lactate and VO2 in elite male flatwater kayakers
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The aim of this study was to determine what effect a change in stroke rate on a kayak ergometer (Dansprint Ltd., Denmark) had on sub-maximal heart rate (HR), blood lactate (BLA) and oxygen uptake (VO2) data. A total of 14 elite male kayakers were recruited and each subject was required to attend the laboratory twice for testing. On the first visit they were medically screened and anthropometric data were obtained. Following a standard 10-min warm-up (80W), a maximal incremental test was performed to ascertain data relating to performance and current fitness levels. During this test HR by radio telemetry (Cardiosport Ltd, Taiwan), VO2 by breath-by-breath analysis (Cosmed Ltd, Italy) and BLA data (YSI Ltd., USA) were recorded. Following a rest period, each subject performed a familiarisation session on the ergometer at the workloads (120 and 150 W) and cadences (70, 80 and 90 strokes.min-1) to be used in the second test session. On the second visit, each subject performed three-minute intervals on the ergometer at sub-maximal workloads of fixed cadences. Data was grouped and tabulated and repeated measures ANOVA was used to analyse differences in physiological variables with varying cadence, post-hoc analysis of significant differences were performed using Scheffe F-test, P<0.05 was considered significant.

7 of 14 subjects have completed the incremental and submaximal tests to date. The mean (±SD) age 21 ± 4 years; height, 1.83 ± 0.03 m; body mass, 79.9 ± 4.6 kg. Mean (±SD) maximal performance data were VO2max, 63.9 ± 9.6 ml.kg.min-1; HR 190 ± 6 beats.min-1; VE 176.1 ± 26.2 L.min-1; BLA 9.8 ± 0.9.mM.L-1. There were no significant differences in blood and lactate data across the three cadences at either workload. However, there was a significant difference in VO2 (P<0.05) between cadences 70 and 90 strokes.min-1 at 120 W. Heart rate data were also significantly different (P<0.05) between cadences 70 and 90 strokes.min-1 at both workloads, and significantly different (P<0.01) between cadences 70 and 90 strokes.min-1 at 120W.

In conclusion, These preliminary results suggest that there is a difference in physiological demand with a change in stroke rate at constant sub-maximal workloads. These were reflected in the changes demonstrated in both heart rate and oxygen uptake data. Blood lactate concentration did not demonstrate any significant changes when stroke rate on the kayak ergometer was altered at constant sub-maximal workloads.

Keywords: flatwater kayaking, ergometry, cadence

Peculiarities of the preparation period of high peak performance handball players
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Sport performance of athletes is predetermined by their training. Comparative relations between training loads and sport performance create possibilities to establish changes of sport performance. One alternative experiments were applied during the period of 1981-2003 seeking to establish peculiarities of specific training programs and efficiency of the preparation period. Data were analyzed by 2x2 repeated measure analysis of variance. Data are presented as means±standard deviation. Data were considered significantly different when the probability was 0.05 or less. Correlation relations have been established by means of Pearson’s correlation coefficient. It was established that preparation period of the handball athletes consists of six micro-cycles while preparing for the main competition. It is necessary to train 33–37 days during the said period, to have 48–53 trainings sessions, to play 9–12 matches and to assign 110–120 hours for preparation. Handball athletes most often have one day per week for passive rest. In separate micro-cycles number of working hours varies from five to seven, training sessions – from 5 to 11, number of matches may increase even up to 4–5; sometimes they are training more than 30 hours during the emphasized cycle. Average trainings per week: days – 5.8±0.8, training sessions – 8.3±2.3, played matches – 1.7±0.8; in total it is trained 19.3±6.6 hours, integral training makes 20.4±6.3%, tactical – 13.4±9.4%, technical 22.3±4%, physical – 32.1±16.8%, theoretical – 12.2±14%. After six weeks of training many of sport performance indices of high peak performance handball athletes improve statistically reliably. Indices characterizing physical capacity as well as power and power endurance indices improve most of all. Endurance (3000 m running) improves statistically reliably (p<0.01) in 9.7±3.7%, power endurance (sit-up in 30 seconds) – in 8.5±2.9% (p<0.05), strength-speed (squat jump) – in 9.4±4.1% (p<0.05), speed-strength (counter movement jump) – in 7.7±2.5% (p<0.05), speed endurance (shuttle running) – in 5.9±2.1% (p<0.05). Speed indices change insignificantly: 30-m standing running increase in 3.8±1.9%. Indices of specific activity improve, however not evenly: the dribbling of 30-m long distance from standing position and after taking runs more quickly accordingly in 4.6±1.8% and in 4.1±1.0%. Catching and passing the ball improves in 4.1±2.1%. All these indices improve, however statistically not significant. Agility changes more significantly – in 7.2±2.2% (p<0.05).

Keywords: handball, sport performance, testing