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BOOK OF ABSTRACTS

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Introduction

In many countries there are concerns about declining levels of physical activity and hence fitness in school-aged children. Resistance training has previously been purported to be unsafe and ineffective in children. However, increasing evidence indicate that resistance training can offer unique benefits even in preadolescent children when appropriately prescribed and supervised, and suggests that youth resistance training may improve motor performance skills.

Methods

Seventeen children (10 girls and 7 boys respectively) (age and anthropometric data at baseline: 9.8±0.7 yrs., height: 142.6±5.9 cm, 40.9±7.3 kg) trained twice a week for 10 weeks using child-sized weight machines and had 10 weeks without specific training thereafter. Each training session consisted of a single set of 20-25 repetitions on 10 different exercises. Motor ability tests were performed pre- and post exercise (sprint, standing broad jump, medicine-ball throw, handgrip strength) – 15 repetition maximum test (15 RM) was performed in following exercises: Chest-press, rowing, and shoulder press. Based on the 15-RM the one repetition maximum strength was predicting by 1RM equation. Assessment also included anthropometric measures of skinfold thickness (10 measurement sites) to calculate subcutaneous body fat.

Results

Calculated maximum strength significantly ($p<0.001$) increased following the 10 week training intervention by 39-51% in the 3 exercises tested. However, following detraining strength significantly declined again ($p<0.05$-0.001) by 9-16%. There was also a significant improvement in motor performance skill performance ($p<0.05$-0.001) from pre- to post exercise without a significant decrease during the detraining period. The resistance exercise intervention resulted in a significant reduction ($p < 0.05$) of subcutaneous body fat followed by a significant increase ($p<0.001$) during the detraining period.

Discussion

These findings support the concept that muscular strength and motor performance skills can be improved during preadolescence by resistance exercise training using moderate intensity and document that these adaptations are partial lost again following the cessation of training.

CHANGES IN TORQUE, TWITCH AND NEUROMUSCULAR PROPERTIES OF THE CALF MUSCLES, DURING A SUBMAXIMAL SUSTAINED FATIGUING CONTRACTION: EXAMINATION IN CHILDREN

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Introduction

Neuromuscular differences in fatigue between children and adults have been mainly examined during maximal contractions and more particularly, it was shown that children were less fatigued compared to adults (Hebestreit et al. 1993). However, during submaximal sustained fatigue tasks no differences between children and adults were observed (Hatzikotoulas et al 2009) and this particularity needs further investigation. Therefore, the purpose of this study was to examine in more detail central and peripheral mechanism that affecting the fatigue process in adults and children during submaximal sustained fatigue test.

Methods

Twenty untrained men (n=10) and prepubescent boys (n=10) volunteered to participate in this study. Initially, all the participants performed on a CYBEX NORM dynamometer 3 maximal voluntary contractions (MVCs) for the plantar flexors and dorsiflexors, respectively. The submaximal fatigue plantar flexion intensity was set at the 20% of the MVC with the highest torque. The fatigue protocol was performed until exhaustion. The following variables were evaluated before and immediately after the fatigue protocol: the MVC, the agonist and antagonist electromyogram (EMG), the level of voluntary activation, the M-wave, the peak twitch torque, the contraction time, the half-relaxation time and the electromechanical delay. All the variables were expressed as percentage of the pre-fatigue values. Analysis of variance was used for the statistical processing. The level of significance was set at $p<0,05$.

Results

After submaximal fatigue protocol prepubescent boys and men were fatigued at the same level. The duration of the fatigue test, the decrease of torque, the voluntary activation, and the increase in agonist and antagonist EMG after fatigue occurred in a similar extend in both groups. Moreover, the decrease of M-wave and the changes in contractile properties after fatigue were similar in men and boys.

Discussion

The obtained results indicate that after a 20% of MVC sustained test no differences were observed between prepubertal boys and adults as it was reported previously. The obtained results give evidence that the examined central and peripheral factors are affected in a similar manner in men and prepubertal boys.

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DIFFERENCES IN PHYSICAL READINESS BETWEEN ARMY COMBAT ARMS IN CROATIAN ARMED FORCES

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INTRODUCTION

Members of Croatian Armed Forces (CAF), are selected in the army branches and combat arms according to their health status, psychological characteristics, military skills and physical readiness (PR). Each combat arm service has its own special demands regarding all above mentioned characteristics and especially PR. Differences in physical abilities between members of different combat arms are crucial for solid selection of soldiers into a certain combat arm. The aim of this research was to determine the differences in physical abilities between members of combat arms in CAF.

METHODS

This research was conducted on a sample of 579 professional soldiers of the CAF. The examinees were members of the Aviation, Armor, Infantry, Field Artillery, Air Defense Artillery, Military Police, Navy and Special Forces. Physical abilities were assessed with the battery of 26 motor and functional tests. Factor analysis was used to reduce the number of 26 manifest variables to 10 well interpretable factors (coor-

dination, agility, explosive strength of throwing, jumping and sprinting type, repetitive strength, flexibility, anaerobic capacity, aerobic capacity and VO2max. Differences in assessed motor and functional factors were analysed through discriminant analysis (DA).
RESULTS
DA revealed 3 statistically significant discriminant functions (DF). First DF (0.56, p=0.00) mostly differentiate members of the Special Forces and Navy based on their repetitive strength and aerobic capacity. Second DF (0.32, p=0.00) mostly differs members of the Navy and Military Police based on their anaerobic endurance, explosive strength of jumping type and agility. The third DF (0.07, p=0.00) differs members of the Armor and the Navy mostly by explosive strength of sprinting type, agility and VO2max.
DISCUSSION
Differences in PR among members of different combat arms are the result of specific physical demands of a certain combat arm service and their physical training programmes. This investigation showed significant differences in the level of PR between CAF's combat arms with the highest diversity noticed between members of Special Forces and Navy. The highest diversity between the CAF's combat arms lies in the area of repetitive strength and aerobic capacity. These two aspects of PR are most often tested in the Army, usually with Army Physical Fitness Test (APFT), and therefore, most of the military training programmes are oriented towards enhancing these two abilities in particularly. It can also be concluded that APFT is a solid battery for PR assessment of military personnel.
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A RESEARCH ABOUT THE RELATIONSHIP BETWEEN ENDURANCE PERFORMANCE AND BLOOD PARAMETERS ON WOMEN FOOTBALL PLAYERS PRE AND AFTER MATCH SEASON

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Introduction
Aerobic capacity is very important in Soccer. It has been observed in many studies that the anemia which is seen frequently in female athletes reduces the endurance performance. Therefore relationship between aerobic capacity and blood parameters had been investigated on Turkish women's 2. League Soccer players before and after match season.
Methods
16 female soccer players mean age 18.69 ± 3.19 years, mean height 161.03 ± 5.13 cm, mean weight 54.10 ± 7.72kg have participated voluntary in this study.
The athletes body composition has been measured pre and after match season by using bioelectric impedance, aerobic capacity (Yo-Yo intermittent recovery test, level 1) and total blood parameters (hemoglobin, haematocrit, white blood cell leukocyte, red blood cell erythrocyte, and mean corpuscular volume). The measurements have been made in standard conditions. The results have been evaluated by SPSS program.
Result
The average values of pre season tests done on athletes, measured as; yoyo average 14.21±0.80 level, VO2max average 53.25 ± 2.77 ml/kg/min, the average Hb 10.21 ± 0.91 g/dl, HTC average 36.56 ± 2.54%, WBC average 7.86 ± 1.82109/l, RBC average 4.18±0.301012/l, MCV average were 87.46 ± 6.12fl.
After the match season tests for the same parameters were; Yo-yo test average as 14.34 ± 0.69 level, VO2max average 53.83 ± 2.47 ml/kg/min, the average Hb 12.66 ± 1.40 g/dl, HTC average 35.08 ± 3.49%, WBC average 7.18 ± 1.65109/l, RBC average 3.72 ± 0.381012/l, MCV average as 94.48 ± 6.70fl.
A significant difference has been determined only in hemoglobin concentrations between pre and post season ($p<0.01$). However, statistically there were no significant differences found in other parameters.
Discussion
As a conclusion of this study, we consider the reason for that between pre and post match seasons, there was a significant difference only in hemoglobin concentration but not in their aerobic capacity is; the precautions taken in order to regulate the anemia in their blood parameters and this had provided a comfortable match season for the athletes as well as helped to prevent any performance decreases.

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EFFECT OF SEQUENCE IN CONCURRENT TRAINING ON PHYSICAL CAPABILITY AND BODY COMPOSITION OF COLLEGE-AGED MEN

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Introduction:
Success in sport is related to applying of appropriate principles and techniques but gaining the necessary physical fitness is crucial. Systematically planned training programs result to the specific development of the performance related factors such as endurance and strength.
The interactive effects of combination of strength and endurance trainings were analyzed in this study. Aim of the study was to compare sequence in the concurrent training with strength and endurance training alone and determine parameters that effect the changes in maximum power, body composition, aerobic and anaerobic power.
Research Method:
Subjects were 50 male students [age 21.04à2.61 years] chosen randomly and divided into five group of ten students on the base of Strength[S], Endurance [E], Strength-Endurance[S-E], Endurance – Strength [E-S] and Control[CO].
T- Test, One-way ANOVA and Scheffe's test were used to compare changes between groups. Statistical significance level was set at $p<0.05$