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ORIGINAL ARTICLE

Effects of 10-week soccer training program on anthropometric, psychological, technical skills and specific performance parameters in youth soccer players

Effets d'un programme d'entraînement de football de dix semaines sur les aptitudes anthropométriques, psychologiques et techniques et les paramètres spécifiques de performance chez des jeunes joueurs de football

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KEYWORDS
Sexual maturity status;
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RAST

Summary
Objectives. — To verify the influence of 10-week soccer training program on anthropometric, psychological, technical skills and specific performance parameters in youth players.
Equipment and methods. — Thirteen young athletes were evaluated two times along the experiment (i.e. in T1, and T2). On the first day, anthropometric evaluation, sexual maturity status, flexibility and psychological parameters were assessed. On the second day, soccer technique tests were performed with 30 min of passive recovery in between. On the third day, the sprint tests (i.e. 10, 20 and 50 m) were measured. Finally, the lactate minimum test was performed on the fourth day.
Results. — Independently from sexual maturity status changes, a 10-week soccer training program with similar characteristics of volume and intensity may lead to significant changes ($P \leq 0.05$) in the body mass, body mass index, lean body mass, total mood disturbance, flexibility, slalom dribble and lob pass tests, 30- and 50-m time-trial performances, running intensity

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at the lactate minimum test and anaerobic parameters of the Running Anaerobic Sprint Test (RAST). In conclusion, based on the importance of soccer technique tests to talent identification, soccer coaches should use this type of evaluation during training routine.
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MOTS CLÉS
Niveau de maturité biologique ;
POMS ;
Tests de connaissance technique de football ;
Test de production d'acide lactique dans un temps minimum ;
RAST

Résumé
Objectives. — Étudier les effets d'un programme d'entraînement de football de dix semaines sur les aptitudes anthropométriques, psychologiques et techniques, et les paramètres spécifiques de la performance de jeunes joueurs de football.
Patients et méthodes. — Treize jeunes athlètes ont été évalués deux fois pendant l'expérimentation (T1 et T2). Au premier jour, évaluation anthropométrique, niveau de maturité biologique, flexibilité et paramètres psychologiques ont été estimés. Au deuxième jour, des tests de connaissance technique de football ont été effectués avec 30 minutes de récupération passive entre eux. Au troisième jour, les performances expérimentales de dix, 30 et 50 minutes ont été mesurées. Finalement, le test de production d'acide lactique dans un temps minimum a été effectué le quatrième jour.
Résultats. — Quelle que soit l'altération du niveau de maturité biologique, un programme d'entraînement de football de dix semaines avec les mêmes caractéristiques de volume et intensité peut produire des modifications très importantes ($p \leq 0{,}05$) de la masse corporelle, de l'index de masse corporelle, de l'index de masse maigre, du niveau total de perturbation d'humeur, de la flexibilité, des dribbles en slalom et lob passes, des performances expérimentales de 30 et 50 minutes, de l'intensité de course dans le test de production d'acide lactique dans un temps minimum et des paramètres anaérobie du Running Anaerobic Sprint Test (RAST). En bref, fondée sur l'importance des tests de football technique pour l'identification des talents, les entraîneurs de football devraient utiliser ce type d'évaluation au cours des entraînements de routine.
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1. Introduction

During a soccer match, more than 90% of the effort is sustained by aerobic metabolism [1] where the players run approximately 10 km in average intensity of the anaerobic threshold [2]. According to Stroyer et al. [3], the actions performed during a match for young soccer players can be classified as: 3.1% standing, 53.8% walking, 34.0% running in low intensity and 9.0% running in high intensity. Although the main physiological metabolic functions in a soccer game are sustained by aerobic metabolism, the most decisive skills, such as jumping, kicking and tackling, are anaerobic [4].

Many studies have been conducted to determine the physiological demands imposed by a soccer match to the players [5—8] and their responses to training programs with youth soccer players. Beyond physiological demands, in studies with young athletes is extremely important to evaluate the specific soccer skills since these parameters are fundamental to talent identification [7]. Although the relationship between maturation and soccer skills has been well reported in the literature [7,9], studies about training effects on soccer skills with youth athletes are scarce.

In fact, some authors investigated the effects of electrostimulation [10] or attentional shift training [11] on soccer skills with adult players. However, up to we know, none studies have evaluated the soccer training effects on physiological and skill parameters with young athletes. Thus, the main purpose of the present investigation was to verify the influence of a 10-week soccer training program on anthropometric, psychological, skill and specific performance parameters with youth players.

2. Materials and methods

2.1. Subjects

Thirteen youth soccer players (mean age of 17.00 ± 0.71 years, ranging from 15 to 18 years), members of the same team playing at national level, participated in the present study. The study was approved by the Institute's Ethics Committee. Informed parental consent and player assent were obtained.

2.2. Experimental design

The subjects were evaluated two times along the study: in July 2009, at the beginning of the season after 1 month of vacation (week 0, T1) and in October 2009, after 10 weeks of soccer training program (week 10, T2). Measurements were performed over a 4-day period. On the first day, the anthropometric evaluation, sexual maturity status, flexibility and psychological parameters were assessed. On the second day, the soccer technique tests were performed with 30 min of passive recovery in between. On the third day, sprint tests (i.e. 10, 20 and 50 m) were measured. Finally, the lactate minimum test was performed on the fourth day.

Athletes were instructed not to engage in strenuous activity the day before the measurements and to maintain a consistent routine regarding their training, sleeping and diet along the study. The physical activities performed during the day before the physical tests were standardized along the experiment and constituted of low intensity exercise sessions (i.e., recovery training).

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