STUDY REGARDING THE IMPORTANCE OF ATHLETIC EXERCISES IN CORRECTING BODY POSTURE IN JUNIOR II, MIDDLE-DISTANCE RUNNING

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Abstract
The purpose of our present research is that of identifying the effects athletics has upon the correction of spine deficiencies in junior II, middle-distance running. Our initial hypothesis was that, by using those instruments of athletics adapted for spine deficiencies, body posture could be corrected in junior II athletes, middle-distance running. Moreover, a specially-designed exercise program, destined to correcting spine deficiencies, could also improve muscular strength and the somatic and functional values. To our study participated 22 middle-distance runners, divided in two lots: the witness group and the experimental one. The research took place during an 8 months period, 2-4 times a week, according to each sportsman’s stage of preparation. The results revealed by the special anthropometric measurements at the final testing, the somatic and functional values, and the testing of dorsal and abdominal muscular strength indicate significant statistical progress (p<0.05) in the experimental group, as a result of the specially-designed athletic program used to correct spine deficiencies.

Key words: athletics, deficiencies, correction

Introduction
Regular physical exercise has a positive influence upon the organism, mainly during the stages of growth and development. It has been demonstrated that it is a crucial factor in weight control, in the growth of muscular and bone tissue, but it has no effect on height, the proportions of the bones system or on biological maturity (Malina, 1983). Research on young athletes and youth in general revealed that sportsmen grow and reach maturity in a similar way as those practicing no sports, which means that both sportive training and competitive stress are nor advantages, nor impediments in what concerns young sportsmen’s development and maturing (Malina & Bouchard, 2004). Despite some growth variations during adolescence, they are not influenced by intensive training, except the local discrepancies usually associated with developing strength in a regime of opposition (Angelakopoulos et. al., 2008). The fastest period of growth takes place immediately after birth, and it slows down during childhood. The transformations at the level at the spine are influenced by postural genesis processes, especially during childhood. According to Angelakopoulos et al. (2008), postural genesis is the process of shaping body posture during growth. According to Kutznner-Kosinska (2001), the antero-posterior curves depend upon various factors, such as: the somatic type, gender, lifestyle and physical activity. Practicing performance sports puts more pressure on the spine. Intense physical effort causes vertebrae, intervertebral discs, ligaments and muscles to lose some of their ability to adapt, while it influences the dimensions of the physiological curves of the spine and implicitly body posture, too. The sports activity has influence on the ossification and the muscular force, which are important elements in shaping the body posture. Middle-distance running is characterized by a dynamic posture, which allows the organism to maintain a normal relation between muscles, as long as the foot touches the ground. Postural deficiencies are associated with running repetitiveness and with some exercises specific to tiredness, which cause high stress levels in the spine of the teenage sportsman (Shahrokhi, Daneshmandi, Rahmani & Javaheri, 2011). The errors in execution techniques, on a background of imbalance caused by poorly developed muscles and reduced muscular elasticity, together with the effects of repetitiveness bring their share in the apparition of postural deficiencies. Athletes who experience postural problems also show muscular imbalance, which implicitly affects them in reaching performance, and also creates the right environment for eventual injuries. When they happen, the first thing to look for is correcting them, before starting any type of sportive training. The spine and its physiological curves have the ability to maintain verticality, due to the special relationships between the functional state of the muscles, the intervertebral articulations and the adjacent tissues.

Hypotheses
If taking action by using means both specific and non-specific to athletics, designed for spine deficiencies, we could correct body posture in junior II athletes, middle-distance trials, without affecting their sports performance. The program of physical exercises envisioned in order to correct postural deficiencies, which has been introduced in the training of junior II middle-distance trials, could influence both muscular strength and somatic and functional values.
Material and Methods

To our experimental study participated junior II athletes, middle-distance runners previously diagnosed with dorsal kyphosis, lumbar lordosis and kypholordosis. They were divided in an experimental group (E) and a control group (C). In order to ensure complete and objective measurements in all research subjects, we used the following measurement methods: general anthropometrics: height, weight; special anthropometrics: cervical and lumbar arrows; somatic and functional values: thoracic elasticity and abdominal tonicity; testing of the muscular strength: strength in abdominal and dorsal muscles (Cordun, 1999; 2009). The experiment took place in a time-span of 8 months, 2-4 times a week, according to each sportman’s stage of preparation. The exercise program destined to correct spine deficiencies was implemented by the experimental group during the warm-up part, which is fundamental, or at the end of the sessions, depending upon the lesson-objectives included in the scholar curriculum and the middle-distance team’s training plan. The means used within the experiment were systemized in the following four exercise categories, specific to middle-distance trials: exercises meant to prepare the body for effort, walking and running exercises, exercises to develop strength (such as walking, jumping, exercises for developing the muscles which sustain the spine and the bones), exercises destined to developing coordination abilities.

Results

For all the parameters taken into account, we calculated the average and the standard deviation, both before (initial testing) and after the implementation of the program of athletic exercises, in order to correct spine deficiencies (final testing). We used SPSS 15.0 programme to statistically interpret the values, and we calculated the t test for independent samples. We also considered p<0,05 to be the mark of signification.

Discussion and conclusion

The results presented in Table 1, obtained after the general anthropometric measurements, both initial and final, are statistically insignificant for both groups, p<0,05. A possible explanation could be the fact that all subjects included in the study are of post-adolescence age, which usually brings the slowing of the somatic development. Table 2 presents the average, the standard deviation and the t test for the special anthropometric measurements that is for the lumbar and cervical arrows. After the final testing we could observe a significant progress in the experimental group, while the t test for the similarity of the averages is statistically statistic, p<0,05.
The difference between the two groups was due to the implementation of the exercises meant to correct lumbar lordosis and dorsal kyphosis. In the case of kypholordosis, we could notice a decrease in the values of the cervical and lumbar arrows in the research group, and their increase in the case of the subject belonging to the control group. Regarding the values of thoracic elasticity and abdominal tonicity used for investigating somatic and functional values (Table 3), it was obvious the value improvement after the final testing, compared to the initial one. The t test for average similarity revealed a statistically significant p (p<0.05), which confirms the role of programs for correcting the postural deficiencies in improving somatic and functional values. In both research groups, the difference of the averages after the final test is statistically significant, when testing muscular strength (Table 4). The value of p<0.05 confirms the importance of the training program implemented to the experimental lot, mainly in increasing the force of dorsal and abdominal muscles. The results we obtained after the general anthropometric measurements, both initial and final, are insignificant from the statistical point of view in both groups, which is due to the slowing in the somatic development of a post-adolescence athlete. The initial special anthropometric evaluation presented mean values in both groups, statistically insignificant, similarly to the initial results. The subsequent evolution, statistically significant, was influenced by the introduction of the differentiated program for the experimental group, which included both specific and non-specific exercises, in order to correct spine deficiencies, which confirms our first hypothesis. We should also mention that the exercises program put to practice did not negatively influence sports performance, since sportsmen from both groups registered significant progress from one competitive year to the other, while the experimental group was only 2.2 seconds faster than the control group. The implementation of the spine deficiencies correction program in junior II, middle-distance runners from the experimental group had a benefic effect upon somatic and functional values. Also, these specially-designed exercises had a positive influence upon improving the dorsal and abdominal muscles strength, which confirms second hypothesis.

References


ISTRAŽIVANJE VAŽNOSTI ATLETSKIH VJEŽBI U KOREKCIJI TJELESNOG DRŽANJA KOD JUNIOR II, SREDNJOPRUGAŠA

Sažetak

Svrha ovog istraživanja bila je identifikacija učinaka koje ima atletika na korekciju nedostataka kralježnice kod junior II srednjoprugaša. Inicijalna hipoteza bila je da je, korištenjem instrumenata atletike prilagođenih nedostacima kralježnice, moguće izvršiti korekcije tjelesnog držanja kod junior II srednjoprugaša. Što više, posebno dizajnirani program vježbi, ciljan na korekciju nedostataka kralježnice također može povećati snagu muskulature kao i somatske i funkcionalne vrijednosti. U istraživanju je sudjelovalo 22 srednjoprugaša, koji su podijeljeni u dva skupa: kontrolna i eksperimentalna grupa. Istraživanje je trajalo 8 mjeseci, 2-4 puta tjedno, u skladu sa svakim pojedinim stanjem pripreme sportaša. Rezultati su prikupljeni uz pomoć posebnih morfoloških mjerenja u finalnom stanju, somatskih i funkcionalnih vrijednosti, kao i testiranje snage dorznalnog dijela i abdominalne muskulature. Otkriven je statistički značajan napredak (p<0.05) eksperimentalne grupe, kao rezultat posebno dizajniranog programa korištenog za korekciju nedostataka kralježnice.

Ključne riječi: atletika, nedostaci, korekcija