EFFECTS OF SPEED ENDURANCE TEST ON THE LEVELS OF CORTISOL AND TESTOSTERONE IN FOOTBALL PLAYERS

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(Preliminary communication)

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Abstract

Although previous studies have shown that trained subjects showed significantly lower cortisol levels and heart rate on the stress of physical exercise compared with untrained men, this paper is showing that even with trained athletes after physical exercise, the level of cortisol and testosterone appears to be increasing. As a consequence of physical exercise, lower heart rate and a better response to stress and stressful situations occurs. After a stressful event (physical exercise) levels of cortisol and testosterone increases, where cortisol and testosterone as other glucocorticoid agents, have widespread effects, which helps to restore homeostasis. The sample was made up of 8. football players of the national level of competition. Testing was conducted in Subotica in 2010. The average age of players was 21 years with an average sport experience of 10 years. The sample was made up of 8. football players of the national level of competition. Testing was conducted in Subotica in 2010. The average age of players was 21 years with an average sport training of 10 years. To assess changes in adaptability the 7x35m speed endurance test (Bangsbo 2003) was used. The results we obtained points to these facts and confirms recent studies which are dealing with the increasing levels of cortisol and testosterone levels after physical exercise.

Keywords: *physical activity, motor testing, training process, cardiac pressure, physiological measurement*

INTRODUCTION

Physical activity plays a key role in the control of neuroendocrine, autonomic and the manner which is responsible for physical and psychosocial stress. Well known, until now, was the fact that after a stressful event (physical exercise) levels of cortisol and testosterone increases. Previous research has shown us that active athletes had significantly lower cortisol levels and heart rate as a result of training process. In a study published by Cordova, Sureda, Tours & Pons, in 2010, the authors say that the test with maximum load is characterized by increased circulation of lymphocytes, higher antibody response, and increased levels of cortisol. This supports the fact that, after each physical exercise, the levels of cortisol and testosterone are increased. In a study published by the Sinar, Polat, Baltaci & Mogulkoc in 2010, the authors concluded that the increase of testosterone level is higher in people who regularly is practicing exercises compared to people who do not have such practice. Hoffman, Kang, Ratamess & Faigenbaum, in 2005, investigated the changes in biochemical

indices during a competitive football season among the colleges. The results obtained indicated that the increased levels of cortisol and testosterone in preparation period were direct result of the training process. Also, the study published by Lupo, Baldi, Bonifazi, Lodi, Martelli, Viti & Carli in 1985, which examined the level of androgens after a football match, concluded that the level of cortisol and androstenedione increased during the match, but returned to the baseline level upon 45 and 90 minutes after the game. Another recent study published by Duke, Ruby, Daly & Hackney in 2007, examined a response of free testosterone and cortisol ratio (FTC) during prolonged endurance exercise. Within the results that they got, they've noticed that the practice caused an increase, compared to the baseline levels of cortisol, followed by a rapid decline in the immediate recovery from exercise. The results also showed that the ratio of the FTC responds to intense exercise, but the aspects of the response may be delayed during recovery lasting. Although the above studies indicates that cortisol and testosterone levels returns to normal in the recovery period, one study published by the Ferret, Mathian, Dupuis, Martin, de Peretti & David in 2004, proves that the cortisol level during one year test was higher in 16 players of Olympique team from Lyon in relation to the control group which consisted of sedentary subjects. As an explanation, the authors specify the burden of training and competition in the soccer championships of France (Legue 1).

METHODS

Sample of students. The sample was made up of eight football players of the national competition level. Testing was conducted in the town of Subotica in 2010. The average age of players was 21 years with an average sports experience time of 10 years.

Sample of variables. To assess changes in adaptability the 7x35m speed endurance test (Bangsbo 2003) was used. The test is performed on a track length of 35 m, which is marked with markers. The task is to overrun at highest speed given a section in seven consecutive terms. After the first attempt, the examinee has 25 seconds to come to the starting point (light running), followed by a re-run.

The experimental procedure. Before starting the test and immediately after the test, the subjects were taken peripheral blood from a finger. After blood analysis we came up with results which showed higher levels of cortisol and testosterone concentration, which should indicate the size of adaptability to changes during the test. Blood analysis was performed by the Center for Medical Biochemistry of the Clinical Center in the city of Nis.

RESULTS

We have noticed an increased level of cortisol and testosterone after the test 7x35m within a larger number of subjects. As the physical condition is of individual character and thus within the respondents has been notified that not all patients have increased parameters, which could be treated as a direct consequence of better well trained individual subjects.

From this display it can be concluded that only

Table 1. Reference values of cortisol and testosterone

	Cortisol	Testosterone
REFERENCE VALUES	171-526 umol	5-35 umol

Table 2. Levels of cortisol and testosterone on the initial and final measuring

	Cortisol								Testosterone							
Examinee	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Initial measuring	410.3	314.3	314	435.7	305.2	394.8	640.2	489.7	5.41	3.95	7.20	3.98	5.89	7.72	13.83	6.24
Final measuring 7x35m	425.8	340.34	279.7	411.7	315.6	451.2	230.4	554.2	10.83	9.01	13.47	5.81	4.48	6.68	11.30	7.28

one respondent didn't have cortisol levels within normal limits (subject No.7 cortisol = 640.2), while two other subjects didn't have the testosterone level within normal ranges (subject No.2 testosterone = 3.95, subject No.4 testosterone = 3.98).

Obtained results upon taking the blood after the speed endurance test 7x35m showed that the increase of cortisol and testosterone levels occurred in 5 subjects (increased cortisol levels: subjects 1, 2, 5, 6, 8; increased testosterone levels: subjects 1, 2 , 3, 4, 8).

CONCLUSION

Based on the results obtained on football players testing in Subotica, despite that the subjects had 10 years sports experience, it can be concluded that there was an increase of cortisol and testosterone plasma level following the test of speed endurance 7x35m, which is explained as an adaptation of organism on the resulting physical state as well as a response to new stressful situation (physical exercise test 7x35m). The results we obtained confirm the researches mentioned before.

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ЕФЕКТИТЕ НА ТЕСТОТ НА БРЗИНСКА ИЗДРЖЛИВОСТ ВРЗ НИВОТО НА КОРТИЗОЛОТ И ТЕСТОСТЕРОНОТ КАЈ ФУДБАЛЕРИТЕ

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(Претходно соопштение)

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Апстракт

Иако, досегашните истражувања покажаа дека кај тренираните испитаници во споредба со нетренираните лица, имаат значително пониско ниво на кортизол и срцев притисок поради стрес предизвикан со физичко вежбање, овој труд покажува дека и кај спортистите по физичкото вежбање, се јавуава зголемување на нивото на кортизолот и тестостеронот. Како последица на физичкото вежбање се јавува понизок срцев притисок како резултат на подобра адаптација на стресот и стресната ситуација. По стресното случување (физичкото вежбање) нивото на кортизолот и тестостеронот расте, при што кортизолот и тестостеронот, како и другите глукокортикоидни агенси, имаат широко распространети ефекти кои го помагаат обновувањето на хомеостазата. Примерокот беше сочинет од 8 фудбалери од сојузен ранг на натпревари. Тестирањето е спроведено во Суботица 2010. година. Просечната возраст на фудбалерите беше 21 година, со просечен тренажен стаж од 10 години. За проценување на адаптационите промени, беше употребен тестот на брзинска издржливост 7x35м ((Bangsbo 2003). Добиените резултати од истражувањето укажаа на наведените факти што ги потврдуваат современите студии кои зборуваат за зголемувањето на кортизолот и тестостеронот по физичкото вежбање.

Клучни зборови: *физичка активност, моторно тестирање, срцев притисок, тренажен процесс, физиолошко мерење*

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