Comparing Impactof Two Types of The Exercising Preparation Programs On Indices of The Body Composition And Muscular Injuries Biomarkers Among Soccer Slayers

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Abstract: The purpose of this study was to compare the specific physiological effects of general preparation phases on the injured muscle blood biomarkers in elite soccer players before the competition. Thus, 22 elite football players have participated in this study. During this study in two stages, the blood sample collection was done before and after the general preparation phase, then before of the competition and the pre-seasonal matches. The collected data were studied by using the statisticalmethod of correlated *t* test at significance level of 0.05 ($\alpha = 0.05$). Results showed that there was no significant reduction in amount of the musculoskeletal masses of football players before and after of the various trainings phases (general and specific exercise ahead of the matches); and, there was indeed a significant reduction in amount of the bodymass values after different training phases than before the general preparation phase. In addition, there was a significant increasesin CPK values before and after the different training phases among the soccer players. And finally; there was a significant increases in LDH values before and after the different training phases in among the soccer players.
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Key words: Biomarkers of the injured muscle; Rhabdomyolysis*;* Cretin kinas ,Musculoskeletal structural injuries

1. Introduction

Previous studies have proven that heavy, unusual and high volume sportive activities may lead to the musculoskeletal structural injuries (Clarkson et al,19912). These injuries may appear as muscle pain, swelling, weakness and loss of power (Sayers et al,2010). In structure terms, sportiveactivities cause weakening the Sarcomer and Sarcolemma to rupture which result to the intracellular proteins reduction and to increase specifically concentration of Cretin kinas (CPK) and lactate dehydrogenase (LDH) in the blood stream; also where damage is extensive, it causes the muscle tissue necrosis and even Rhabdomyolysis (proske,2001 & magal,2010). Recently, Epstein et al. have showed that there is a strong relationship between the anaerobic exercises and the serum level of Cretin kinas after exercises (Epstein et al,2006). The soccer is anaerobic exercise. On the other hand, the conducted exercises during various phases in this field are at high risk of infection to such damages, due to tiny muscle injuries.

2. Methodology

In this study, 22 elite soccer with the age characteristics of 26.42 ±0.81 years, body weight of 76.18 ±1.93 kg, musculoskeletalmass of 38.30 ±0.99, the aerobic fitness level of 45.4 ±0.83 milliliters of oxygen consumption per kilogram of body weight, BMI ($kg.m^{-2}$): 23.4 ±0.3, and the exercise experiences of 10.5 years, have participated. During this two- staged study, the blood samples were taken before and after the general preparation phase and before the seasonal matches.

The study protocol had been developed based on non-linear period grading model, during which the individuals had to perform different exercises according to the training phases from 5 to 8 sessions per week. So the patterns of weekly exercise (micro cycle) were codified for 5 to 8 sessions per week. Accordingly, during the general preparation phase, the exercise volume would have been high, and as getting close to the competition phase, it would have proportionally lowered with higher density; in such a way that the highest micro cycle shock during the pre match phase (meso cycle) in the whole season of preparation training (micro cycle) would have been assigned to it.

3. Results

Results showed that there was no significant reduction in amount of musculoskeletal mass (t20=-0.264, p=0.794), before and after different training phases (general and specific fitness and ahead of the competition); and there was a significant reduction of the body mass values after different phases of exercises compared to the pre-phase values of general preparation phase (t20=2.91, p=0.009). Furthermore;

there was a significant increases in CPK value before and after various training phases (t20=-35.47, p=0.000); and finally, there was a significant increases in LDH value before and after various training phases (t20=-39.00, p=0.000).

Table 1.values of body composition and serum levels of the soccer players' CPK and LDH before and after phases of general and specific training,
and ahead of the competition.

Variable	Average		Standard deviation from average		t-Values	Level Of sig
	Before training phase	After training phase	Before training phase	After training phase		
Weight(Kg)	76.18	74.18	1.94	1.96	9.28	0.000*
Musculoskeletal mass (Kg)	38.30	38.41	0.99	1.14	-0.26	0.794*
Fat mass(Kg)	9.52	7.67	0.47	0.46	29.01	0.000*
Body mass profile ($Kg.m^{-2}$)	23.40	23.18	0.3	0.299	2.94	0.000*
Cretin kinas (IU/L) (CPK)	156.79	215.94	23.73	30.74	-4.1	0.001*
lactate dehydrogenase (U/L) (LDH)	227.39	318.95	9.98	10.19	-79.79	0.001*

* level of significance in $p < 0.05$

4. Discussion

According to this research's findings, it is clear that soccer players who perform different exercises during the various training phases (general and specific preparation before the competition) would have likely encountered the problems of tiny muscle injuries. Accordingly, the enzyme levels of CPK and LDH were also significantly increased which expresses/suggests that there is a damageto tiny muscle at the sarcomeres' location. Additionally; the amount of musculoskeletal mass of the elite soccer players had been significantly reduced which can be involved in incidence of muscle injuries. Siejo et al have described so when exercise intensity is proportional to the person's natural metabolism, the muscle tissue continues its activity function without significant changes in membrane permeability. However; when exercise intensity is increasing, the ATP production capacity would face disorders, and the created changes cause an increase of the membrane permeability which results to increase the CPK and LDH serums' activities (Seijo et al,1985).
The results showed that sportive activities, especially the various exercising phases lead to increase levels of the Cretin kinas and lactate dehydrogenase serums, so these biomarkers are indication of the muscle injuries. Thus; these findings may indicate that the incidence rate of musculoskeletal injuries among team players specially soccer players are high, that could be an indication of more pressure on the players regardless of the same exercise intensity. Also, a relatively longer preparation period of soccer players is an effective factor ion this phenomenon.

Consequently;thefootball coaches are recommended, especially the body building instructors who work in various leagues, to proportionate the activities Intensity and exercises of these athletes tailored to their ability level. And, since this tiny muscle injury has occurred in phases before entering athletic competitions, thus they are expected to provide powerful and all-round soccer players' entry into the competition, by adapting an appropriate recovery measures.

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