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Comparison of Certain Blood Values of Coaches of National Boxing Team Before and After Matches

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Ragıp Pala, Vedat Çınar, Yakup Kılıç, Mustafa Karadağ, Numan Alpay, Serdar Orhan: Comparison of Certain Blood Values of Coaches of National Boxing Team Before and After Matches

ABSTRACT

24 male coaches, who train national boxing teams of big male boxers (12) and big female boxers (12) and in the age range 27-56, constitute the research material. Blood samples of coaches in the research group were taken twice being before and after the matches. Data and laboratory results were utilized as covariant. Relative changes in the data obtained were analyzed in the SAS package program by utilizing PROC MEANS procedure. Significance level of differences between two measurements is determined by means of *Paired t* test that adds significance in the level of $P<0.05$. Statistically significant difference is observed in the Glucose levels of coaches as one of the blood parameters before and after the matches ($P=0,0365$). Difference is seen in the values of insulin levels before and after the matches, however this difference is not found statistically significant ($P=0,7135$). Statistically significant increase is found in the cortisol levels before and after matches ($P<0,001$). Decrease is determined in the values of urea levels before and after the matches, however the difference in between is not found significant. ($P=0,0594$). The decrease specified in the creatine levels before and after the matches is not found to be significant (P=0,0745). In reference to the results of the study, it may be stated that significant changes are observed in the glucose and cortisol levels of coaches of national boxing team according to the measurements taken before and after matches.

Key words: *Coach, Blood, Glucose, Insulin, Cortisol, Urea, Creatine.*

Introduction

A combat sport, also known as a fighting sport, is a competitive contact sport where two competitors fight under certain rules of engagement. Boxing is an example of combat sports and the one of the oldest sports. Two opponents make efforts for success using their fists [1]. Boxing coaches experience both physical and mental fatigue. It is obvious that coaches are also exerting great efforts for the sporters to be successful since national team camps are the places where boxers are subjected to an intense training program. Boxing coaches may be subjected to 10 times more oxygen consumption than normal as a result of effort and excitement experienced in the management of ringside [2]. It is known that there are changes in the blood parameters according to the intensity, duration and type of exercises. Changes may be observed in the blood values of an individual during and after intense exercising in line with the training status of the person, environmental conditions and nutrition, etc. When we examine studies realized on blood biochemistry, it is seen that there are different opinions on the effects of exercises performed regularly. Besides studies reporting positive developments in the blood biochemistry after an acute exercise, there are studies suggesting that change is observed by means of long-term exercising instead of acute exercising [3]. It is supposed that these differences are dependent on the intensity, duration, frequency of exercises, and physical, physiological and fitness status of the test subjects participating in the research [4.5]. However, it is determined that regularly performed exercises have positive impact on all body systems and they prevent occurrence of health problems [6.7.8.9]. When unnecessary efforts and excitement of coaches increase the stress, performance of boxers may be affected adversely. Concentrations of coaches should be at top level especially in the World, Olympiad and European championships. With this aim, (Glucose, Insulin, Cortisol, Urea, Creatine) levels of male boxing coaches of male and female national boxing teams are examined by means of blood samples taken before and after the matches of International boxing championship.

Instrument and Method:

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24 male coaches, who train national boxing teams of big male boxers (12) and big female boxers (12) and in the age range 27-56, constitute the research material. Blood samples of coaches participating in international boxing tournament were taken before and after matches from their forearm vein into gel biochemistry tubes by means of 10 cc injectors, and they were centrifuged on Hettich trade mark Universal 320 model after waiting time of ten minutes is completed. After serums of blood samples received are eluted by centrifuge at 4000 rotations for 5 minutes, they were taken into eppendorf tubes and they were preserved in Hettich freezer in the Fırat University, Faculty of Veterinary Science, Department of Animal Nutrition at -80 ^{o}C till the time of analysis. Insulin and Cortisol serum samples were determined by means of Siemens trade mark Immulite 2000XPI direct chmiluminescence closed system method. Glucose, Urea and Creatine were specified with the aid of Siemens trade mark 1800 adviya nephelometry closed system method.

Data collected before the match and laboratory results were utilized as covariant. Relative changes in the data obtained after the match were analyzed by SAS package program with the utilization of PROC MEANS procedure [10]. Significance level of changes occurred was determined with the aid of *Paired t* test which adds significance in the level of $P<0.05$.

Table 1: Blood levels of Coaches (n=24)

Parameter	Before match	After match	Difference	t value	P
	Mean ± SD	Mean ± SD	Mean ± SD		
Glucose (mg/dl)	109,58±27,71	95,79±13,96	13,79±21,94	2,18	0,0365 *
Insulin (ulU/ml)	11,17±9,16	12,01±6,31	-0,85±7,90	-0,37	0,7135 -
Cortisol (ug/dl)	14,40±6,26	22,72±5,07	-8,31±5,70	-5,05	0,0001 **
Urea (mg/dl)	34,04±6,03	31,63±6,58	2,42±6,31	2,42	0,0594 -
Creatine (mg/dl)	1,15±0,20	1,04±0,19	0,10±0,20	1,83	0,0745 -

*- : P>0.05 *: P< 0.05 **: P< 0,0001*

When serum parameters of coaches are examined, change is observed before and after matches. Accordingly, it is determined that glucose value is 109.58±27.71mg/dl before match, and 95.79±13.96 mg/dl after match; and decrease in the plasma level is specified. The difference between is found to be statistically significant ($P<0.05$; Table 1). As one of the serum parameters, It is determined that Insulin measurements were 11.17±9.16 ulU/ml before match, and 12.01±6.31ulU/ml after match; it has increased after match in the level of plasma. Difference in between is not found statistically significant ($P>0.05$; Table 1). When we examine Cortisol measurements as one of the serum parameters, it is found as 14.40±6,.26 ug/dl before match and as 22.72±5.07 ug/dl after match, and it is determined that it has increased at the level of plasma. The difference in between is found statistically significant ($P<0.0001$; Table 1). In the examination of measurements of urea as one of the serum parameters, it is established that it is 34.04±6.03 mg/dl before match and 31.63±6.58 mg/dl after match, and decrease is determined after match at the plasma level. Difference in between is not found statistically significant. ($P>0.05$; Table 1). When we examine measurements of creatine as a serum parameter, it is found to be 1.15±0.20 mg/dl before match and 1.04±0.19 mg/dl after match, and decrease is determined at the plasma level. The difference in between is not found statistically significant ($P>0.05$; Table 1).

Discussion:

Average age of coaches is determined as 41 in our research where we examined certain blood parameters of coaches of national boxing team before and after matches. Decrease in the measurements of Glucose as a serum parameter is observed before and after matches. This decrease is statistically found significant (Table 1). When we examine similar studies, increase in the blood glucose levels is determined in elite female taekwondo sporters before and after exercises [11], in male sporters playing football in the young team after aerobic and anaerobic exercises [12], in the amateur football and basketball players before and after exercises [13], in male sporters playing professional football after moderate and intense exercises [14], in elite male beach handball players before and after camp [15], in training group of four weeks [16], in boxers before and after camp [17], in boxers before and after matches [18]. For the reason of difference between coaches and sporters, it can be said that sporters are exposed to fatigue together with the exercising, thus this increases their glucose levels. Oxidation of glucose increases several times because of exercises. In this case, glucagon hormone is secreted when blood glucose level decreases, and blood glucose level is increased. As the exercises continue, glucose utilization of the muscle can increase 7 to 20 times in line with the intensity and duration, and blood glucose begins to be an important energy source. Whereas blood glucose level does not change in big extent in low intensity exercises, it may increase 15 to 20% in high intensity exercises [19]. Statistically significant decrease is observed in the glucose levels before and after matches in our study. We can say that coaches increase their glucose levels before the

match and decrease these levels after the match depending upon the psychological stress. When we examine insulin values, increase I seen before and after the matches. However, this increase is not found statistically significant (Table 1). In the similar studies, decrease is determined in the boxers before and after camp [17], in the boxers before and after matches [18], in amateur football and basketball players before and after exercises [13]. There is a change in the secretion of insulin since glucose level in the blood changes during exercising [20]. In our study, increase subject to glucose is observed in insulin levels after matches in comparison to the values measured before match. However this increase is not statistically significant. Also, increase is determined in the Cortisol values of coaches before and after matches, and this increase is found statistically important (Table 1). When we examine similar studies, it is reported that cortisol levels of basketball players increased before and after exercising [21]. In other studies, it is informed that cortisol levels increased in volleyball players in a long duration volleyball match continuing for 60-180 minutes and in short duration, high intensity match [22], in boxers before and after camp [17], in boxers before and after match[18]. Although coaches are not subjected to intense physical loading, they exert energy just like sporters. These results support our findings. Decrease is observed in the urea values before and after match. This decrease is not significant statistically (Table 1). When we examine similar studies, no significant difference is determined between urea measurements of boxers before and after camp [17], boxers before and after matches [18], amateur football and basketball players before and after exercising [13], before and after training [23], before and after training [24] These results show similarity with our findings. Creatine values have decreased before and after matches. This decrease is not statistically significant (Table 1). When we examine similar studies, no significant difference is reported in boxers before and after camp [17], in boxers before and after matches [18], before and after training [23]. These results show parallelism with the results of our study.

According to the results of our study, it may be stated that significant changes are observed in the glucose and cortisol levels of coaches of national boxing team according to the measurements taken before and after matches.

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