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The relationship between football referees' hormonal status and their Performance

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ABSTRACT

The main aim of this research is study the relationship between football referees' hormonal status and their Performance. The population is the working professional referees in super league and first league of Iranian football. They are 90 (N=90) people who work in 2012-2013 season and 30 (n=30) of them are sampled randomly for the study. referees' saliva was sampled at two levels: first, before starting the match, finally immediately after the match. The sampling was done for three matches for per referee and the samples were sent to the lab for analyzing. The calculations were done using Pearson's correlation coefficient and Statistical Package for the Social Sciences (SPSS Inc., version 18.0) was used for the analyses. P-values below 0.05 were considered statistically significant. Results showed that there is a significant negative correlation between referees' hormonal status and performance. That is the referees' hormonal status had an impact on how they judged.

Key words: Performance, hormonal status.

INTRODUCTION

Hormones are chemical messengers that regulate physiological and metabolic functions, maintain homeostasis and adapt stress. Hormones can be made of a variety of different substances including: proteins, amino acids, cholesterol, steroids, and glycoprotein. The process in which a hormone brings about a specific physiological response can be very complicated which requires a detailed discussion beyond the scope of this review. Hormones bind to specific receptor molecules and then initiate a cascade of events that results in a specific response. Some hormones also travel in the blood bound to proteins which affects the bioavailability of the hormone since only the portion that is unbound or free is biologically active. The purpose of hormonal status in this investigation is changes of the amount of the Testosterone/Cortisol Ratio (increase and decrease) in the in the competition day.

Testosterone is an anabolic hormone that stimulates protein synthesis and is responsible for Development and maintaining of tissue.[1]. Cortisol is a catabolic hormone and in fact, is the most important anti-stress hormones in the body. However, its increase may cause problems like protein degradation and injuries for immune system as the most important ones in long-term. [2].

Therefore the role of testosterone as an anabolic hormone and cortisol as a catabolic hormone is more important.[3]. Results have shown that if the ratio between these two hormones for more than 30 percent reduce and this reduction continued, can cause injury for athletes.[4]. In competitive sport situations, some factors such as the importance of

sport events, individual factors like trait anxiety, self believe and self-sufficient of the concerned person may cause change in hormonal status. Some sports like football has always maintained a foothold in the fans enthusiasm.[5]. Football has become one of the most attractive, popular and beautiful events in the world. Referee's role, is a basic role in a match, the referees and assistant referees are involved in a competitive match. In each football competition, two teams are involved. Referees function is to control the game in implementing rules and regulations. To do so, they must be physically fit and mentally alert. They must have balanced personality to tackle all situations.

Related Literature

Handziski et al (2006) assessed some hormonal patterns in professional football during a half season matches. 30 players were included in this study. All medical tests were done in 3n stages: before preparation, before the match, and after the match. There was the meaningful difference between hormonal levels of each stage, Cortisol and testosterone rate decreases was more than 30% at the third stage. Hormonal differences suggest that some indices can show overtraining symptoms in players at the end of the season.[6].

Doan et al (2007) analyzed the effect of a 36 hole golf competition on Cortisol, testosterone and Cortisol / testosterone in saliva and its relations on 8 elite male golfers (average age 20/3). Saliva sample were collected 45 minutes before each round and immediately after each hole. Cortisol showed a meaningful increase, but testosterone level showed no changes during the match. Cortisol / Testosterone was low during the game, there was a high relation between Cortisol / Testosterone responses before and after 36 holes, physical anxiety was positively related to Cortisol and negatively to testosterone before the rounds. These results showed meaningful hormonal responses in a 10 hour competitive golf game.[7].

Edward et al (2006) studied the effects of n inter – college football match on saliva Cortisol and testosterone. The testees were 18 women players and 22 men players ranging (8 to 22 years) old. Men saliva samples were gathered after winning in a match and women saliva samples were taken after a winning and a losing. The result showed an increase in saliva Cortisol and testosterone for both men and women. In each group, saliva testosterone was strongly related to social abilities of team members but the nature of this relation was different based on gender.[8].

MATERIALS AND METHODS

Research Methodology

The present research is a kind of correlations as well as the descriptive research and semi-empirical Research.

3.3. Population & Sample

Professional referees and assistant referees of football who are involved in the premiere and first soccer leagues in Iran. It was almost 90 in 2012-2013 year. From this population 30 persons were selected randomly.

3.4. Variables& Tools

The variables of this study were: performance, hormonal status. Hormonal analysis for testosterone and cortisol was done from saliva using related biochemical kits, Performance was done by Assessor's mark, The amount of testosterone and cortisol were measured by laboratory kit RADIM Made in Germany used by immunoassay method.

Variables	Tools
Performance	Assessor's report
Hormonal status	Cortisol + testosterone

3.5. Procedure

The researcher and his assistants attended the site an hour before the competition and after taking saliva by putting a little cotton under tongue of referees, they were sent to the lab for analysis of testosterone and cortisol. This was done 2 times after 3 competitions for each referee. 1 time before start the match, 1 time after the match to determine the hormonal status during the play time, hence each referee was tested based on testosterone and cortisol in 3 competitions and their average was used to identify the hormonal status, further the performance of referees evaluated by the mark of assessors.

3.6. Statistical Methods

Pearson's correlation coefficient was employed to establish relationship between the variables. The Statistical Package for the Social Sciences (SPSS Inc., version 18.0) was used for the analyses. P-values below 0.05 were considered statistically significant.

Data Analysis

There is a relationship between referees' hormonal status and their Performance.

To investigate this hypothesis, it is necessary to examine the normality of hormonal status and performance of referees.

One-Sample Kolmogorov-Smirnov Test

Statics indicators	Kolmogorov-Smirnov's statistic	Asymp. Sig. (2-tailed)
Hormonal status	1.844	0.2
Performance referees	0.672	0.757

According to the above table, the KS test result reveals that the variables are normally distributed since the level of significance for these variables is more than $\alpha = 0.05$.

Now, according to the normality of variables, Pearson's correlation coefficient was used to examine this hypothesis.

Relationship between referees' hormonal status and performance

t/c (mean±Std)	assessor's mark (mean±Std)	Pearson Correlation	Sig. (2-tailed)
0.07±0.036	7.99±0.733	-0.862	0.033

Null hypothesis (H_0) does not show a significant relationship between the variables, but the contrary hypothesis (H_1) confirms a significant relationship between the variable.

$H_0: \rho = 0$

$H_1: \rho \neq 0$

H_1 : There is a relationship between referees' hormonal status and their Performance.

H_0 : There is not a relationship between referees' hormonal status and their Performance.

In the above tests, the null hypothesis (H_0) will be rejected, if the test level of significance is less than 0.05 ($\text{sig} < 0.05$) and the rejection of the null hypothesis means that there is a significant relationship.

CONCLUSION

According to the above table, since the level of significant is lower than 0.05. Moreover, with regards to the negative Pearson correlation coefficient, there is a significant negative correlation between the hormones status and the performance of football referees. In other words, the increase in hormone levels will decrease the performance of the referees. Hence according to the assumption of this study, a meaningful correlation is found between the referees' hormonal condition and their performance. In other words, the hormonal changes in referee's body influence their judgment. Also a meaningful increase in saliva cortisol is seen during the match. Cortisol increase during and right after physical activities helps maintain the blood pressure and the blood sugar and homeostasis.[9]. An intensive physical activity is one important effective stimulates for cortisol release.

Intensity and duration of the aerobic and anaerobic activities effects the amount of cortisol release .[10]. The products of anaerobic activities are lactate accumulation, FPH, and hypoxia from the hypothalamus pituitary adrenal axis. Accordingly, some researchers believe that the level of cortisol release depends on the amount of lactate accumulation during the activities.[11].

One thing that is really considerable is that a football match lasts for 90 minutes and in some cases 120 minutes that is actually a long period of physical activities, and this explains the high cortisol concentration. The movement pattern and the intensity of the activities during the matches how that the involved energy system is the anaerobic one. The referee tolerates a high physical pressure during the match and the intensity is in the threshold of cortisol

release. The increasing trend of cortisol continues after the match, too. After the match the adrenal gland produces and releases cortisol.[12]. The cortical adrenal releases this hormone in response to stressful conditions by increasing ACTH .[13]. This finding agrees with the report by Salvador *et al* (2003) that shows cortisol increase after official and unofficial judo competitions. All researchers agree that emotional anxiety that is with the completion effects the hypothalamus pituitary adrenal axis, so production and release increase. [14].

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