Volume 2021, 1-6 | Article ID : EML-2110152112402

Journal of Express Medical Letters

http://www.htpub.org/Express-Medical-Letters/

ISSN

The effect of educational adjustment courses after eight weeks of selected exercises on safety indicators Cellular semi-professional male soccerists

Alihossein Taghavi [*a]

[a] Faculty of Rehabilitation, University of Shiraz, Shiraz, Iran

Article

Received: 1th October 2021
Received in revised form: 13th October 2021
Accepted: 15th October 2021

Keywords:
Modification of training,
Granulosin,
Leukocytes,
Lymphocytes,
Male soccer players

Abstract

One of the strategies used by athletes to improve performance in many sports is to adjust the training load before the main competition. This study aimed to investigate the effect of a training load adjustment period after eight weeks of selected training on cellular safety indices of semi-professional male football players. The statistical population of study consisted of football players of Mazandaran province. 30 semi-professional football players after eight weeks of randomly selected football training to three. The equal groups were adjusted for exercise (1) 25% reduction in exercise volume, exercise adjustment (2) 50% reduction in exercise volume and control. After eight weeks of football training, two weeks of training adjustment was performed. Blood samples were taken in three stages, before the start of eight weeks of training, before and after training adjustment. Mean and standard deviation were used for the statistical description of data, and correlated t-test, one-way analysis of variance and Bonferroni test were used for inferential data analysis. The significance level was considered 0.05. The results showed that after two weeks of training adjustment, in 25 and 50% groups, the number of granulysin increased by 5.9% and 2.61%, respectively, but was not statistically significant. Leukocyte levels in 25 and 50% groups were significantly reduced by 9.44 and 13.8%, respectively, and lymphocytes by 36.17 and 18.91%, respectively ($P < 0.05$). In general, it seems that the adjustment of two-week training caused a significant decrease in leukocytes and lymphocytes but did not have a substantial effect on the amount of granulysin. Modulation of exercise by 50% had a more substantial reduction than modulation of 25% in leukocytes and lymphocytes. Modifying training is an excellent strategy to improve the immune system and reduce inflammation after a period of high-pressure training in football players.

Introduction

One of the strategies used by athletes to improve performance in many sports is to adjust the training before the main competition. Factors that are manipulated in the training adjustment period to improve performance are volume, intensity. The frequency of exercise and the duration of the exercise adjustment period. Power and reduction of training volume have been emphasized. The main goal of the training adjustment period is to reduce the adverse physiological and psychological effects of daily training (i.e. reduce fatigue) and instead further strengthen the positive results of activity (i.e. physical fitness gains) [1]. Despite its relatively short

duration, physiological adaptations are abundant in the exercise adjustment period, although some findings are contradictory. They examined metabolic, hormonal, neuromuscular, and immunological during exercise modification (e.g., exercise modification with F). The production of muscle glycogen, oxidation enzymes, haemoglobin/hematocrit ratio, maximal oxygen consumption, performance improvement with increased aerobic power, anaerobic power, strength and muscle power and the development of the first researchers to increase strength and power following two immune systems. Castille et al. Reported training adjustment week in a group of 17 college swimmers. This increase in strength was correlated with the observed performance improvement. Although the beneficial effects of reducing exercise volume when adjusting exercise have been repeatedly reported by researchers in swimming, cycling, and triple disciplines, There have been many studies, and other studies have reported the range of variability of exercise adjustment between 41 to 60%. Many factors affect the immune system, one of which is exercise [2]. A review of the research is devoted to the effects of exercise on the immune system. The impact of various exercise types, intensity, and duration on different immune system parameters are examined. In some areas, general agreement on the effects of exercise. There is a lot of research on the immune system, including today, which emphasizes that strenuous, prolonged exercise weakens the immune system. And lymphocytes disrupt. In this regard, even the title It has been suggested that if exercise levels are gradually increased, people may not be exposed to inflammation, but the hormones released due to exercise stress are considered to be a disturbing factor for the immune system [3]. Extensive research on the effects of exercise on the immune system, there is no general agreement that this is related to differences in types of sports activities, intensity and duration of the training, individual differences and sports experience of individuals, and different measurements of immune system factors and this The issue of further research in this field reveals. Due to the nature of the sport of football, the sport is classified as an intense periodic group sport. Most players during a match usually cover a distance of 10-12 km. They run at an intensity close to the anaerobic threshold (80-90% of maximum heart rate or 80-70% of oxygen consumption).

A footballer needs a variety of explosive activities such as jumping, shooting, tackling, changing direction, running fast, changing the playing area. Soccer players differ from other disciplines in that they require a combination of different physiological characteristics. All of this dramatically increases the physical strain on players and turns football into a physiologically intense sport. Changes in these indicators have often been identified as improving an individual's athletic performance, with UNO et al. 2012 examining changes in immune function following a two-week training adjustment period in 22 soccer players. Exercise reduced leukocytes, lymphocytes and neutrophils and improved immune system function [4]. Since football is a strenuous physical activity, it can hurt athletes' immune systems. Therefore, study the adjustment of exercise and mechanism. A protein that affects the immune system of soccer players can be important, including cytolytic granulysin (cell destruction or dissolution) with a wide range of antimicrobial (antimicrobial) activity and tumour cider and lymphocytes. The cells of K. Natural human immunodeficiency (NK) produce two tumour cells degradations. Research results based on human NK NK mRNA isolation and four systolic (CTL) CD8 (CD8) evidence that granulysin is a cytolytic protein expressed in NK cells. (In vitro analysis using flow cytometry showed that CD3 and CD56NK cells strongly express granulysin. A small part of it was expressed by CD3 T cells, but in other cell types, B cells, monocytes, and granulocytes are not expressed in peripheral blood [5]. Studies show that in patients without NK cells, serum granulysin is almost indistinguishable, but after bone marrow transplantation and at the

same time as the cells heal. Serum granulysin levels in NK showed a gradual increase. Thus, serum granulysin levels in healthy individuals may reflect the total population size of NK cells. Granulosin concentrations may indicate cellular immunity, as well as a strong indicator of increased exercise training [6]. Because research has shown that cellular immunity decreases after strenuous activity. Low granulysin concentrations in patients with gastric cancer A healthy lifestyle has been reported to increase intracellular NK granulysin and the peripheral number of NK cells. However, the relationship between NK cells and granulysin concentrations has been reported. Intense activity without 5 is still unknown . Zang et al. Report 6 remain unchanged, and in contrast, the number of NK cells in the bloodstream increased [7].

Focal et al. Increased the expression of granulysin gene in blood cells 2 to 3 times, while this increase in translation with increasing granulysin concentration in the bloodstream for 30 minutes is still unknown (one of the most significant and constant changes in the flow exercise is seen as leukocytosis (increase in circulating white blood cells). The number of circulating white blood cells may be Increased four times the rest time; Stay high after stopping exercise. The amount of leukocytosis is directly related to the intensity and duration of exercise [8]. In addition, increased cortisol levels can be a factor in leukocytosis. Also, the number of lymphocytes increases progressively with increasing workload (lymphocytosis), and the amount depends on the type and intensity of exercise.

Four weeks of training adjustment followed by eight weeks of increasing training for national and international swimmers Showed a decrease in the percentage of neutrophils after exercise adjustment, while the number of lymphocytes tended to increase.The increase in lymphocytes positively correlated with the decrease in exercise volume during the exercise adjustment period (0.86). The six-day short-term training adjustment period (including a decrease of 0.80 in high-intensity interval training) showed a slight increase in nine male semi-endurance runners but a significant increase in neutrophils (0.13) and granulocytes (11/11). However, a review of the peak strategy for optimal performance found that much of the empirical research has been on reducing the burden on scientific texts in individual competitions. There is an effect of reducing the training load in a team discipline, including football, and these limited findings indicate that effective training can be practised if adjusted. Lecce increased team sports in the competition. Therefore, the field of study on reducing training load in team sports needs more research. Therefore, whether a training modification period of 25 and 50% is effective on granulysin, leukocytes, and lymphocytes. Diet, control of other physical activities, hereditary traits, and genetic constructs were beyond the researcher's scope. Hence, the present study seeks to investigate the effect of a two-week training adjustment period with a volume reduction of 25 and 50% on some indicators of players' cellular immune systems. Examine and study male football.

Research Method

This research is a quasi-experimental field study and is applied in terms of using the obtained results. 30 semi-professional football players. Thirty semi-professional football players participated in the study.

Inclusion criteria included having a level of general physical and mental health. All participants received written information about the research. They were then asked to sign a written consent form. The present study

was conducted under a physician and sports physiologist's supervision, introduced to exercise and blood sampling in a single session. Biochemical variables At first, 24 hours before the start of the first training session, subjects were taken five ccs of blood from the anterior vein of the forearm at 8 o'clock in the fasting state. A unique eight-week football training program was performed (Table 1). At the end of the eighth week, 24 hours after the last training session, the fasting blood sample was measured again at 8 a.m. The subjects were randomly measured. Duffy was divided into three groups: training adjustment group 25% reduction in training volume and maintenance of training intensity to 10 people, training adjustment group 50% reduction in training volume and maintenance training intensity to 10 people and control group to 10 people for two They practised for another week. At the end of this period, for the third time, the subjects' blood samples were measured 24 hours after the last exercise session at 8 a.m. on an empty stomach.

Laboratory Assessment 24 hours before the start of exercise, the fourth week after training and 24 hours after the end of practice after 10-8 hours of fasting at 8 am, resting blood samples were taken to determine the amount of granulysin, number of leukocytes and lymphocytes. It is worth noting that all three stages of blood sampling were performed at eight o'clock in the morning on an empty stomach. To determine the amount of granulysin, the ELISA method with Biospes kit made in China was used. To measure white blood cells and lymphocytes with a counting device (8001 sysmexXs Counter Cell) was used by differential counting method by flow cytometry. Periodic, resistance, speed, plyometric and game exercises are performed in small groups. The total volume of weekly activities for eight weeks is presented in Table 2.

Table 1 The average time allotted to each exercise during eight to seven

Exercise items	**Weeks of practice**							
	1	2	3	4	5	6	7	8
Warm-up (minutes)	15 (6)	15 (6)	15 (6)	15 (6)	15 (6)	15 (6)	15 (6)	15 (6)
Intermittent running (minutes)	25(2)	25(2)	25(2)	25(2)	25(2)	25(2)	25(2)	25(2)
Resistance training (minutes)	60(3)	60(3)	60(3)	60(3)	60(3)	60(3)	60(3)	60(3)
Play in small groups (minutes)	60(1)	60(1)	60(1)	60(1)	60(1)	60(1)	60(1)	-
Cooling (minutes)	10(6)	10(6)	10(6)	10(6)	10(6)	10(6)	10(6)	10(6)
Plyometric exercises (jumping)	-	-	-	40	40	40	40	40
Speed training (meters)	140(2)	140(2)	140(2)	140(2)	140(2)	140(2)	140(2)	140(2)

(Numbers in parentheses indicate the number of sessions per week, and non-parentheses indicate the time for regular running, resistance training and small group play (minutes) and distance (meters) for speed training).

Adjusting the Periodic Exercise: The training volume of the group was reduced by 25%. The training volume was reduced by 25% by reducing the number of four-minute runs to three times per session, and the group was reduced by 50%. Reduced 25%. Resistance training: This section was performed three times a week, and a combination of free weight training and training with machines including squats, chest presses, knee bending, machine stretching, open Knee exercises were exercises to strengthen the abdominal muscles and torso openers, which were performed in the mentioned order: each activity was performed in four shifts with 4-5 repetitions at the rate of 0.90-85, a maximum repetition with 3-minute rest intervals between sessions. Abdominal and trunk opener exercises were performed four times with 15-12 repetitions. In the period of reducing the training volume,

the training program of the control group did not change according to the number of repetitions. The courses of the eighth week continued until the end of the tipping period. Still, the number of rounds in The group decreased 25% from four to three periods of movement and 50% from four to two periods of movement 140 m continued in the eighth week until the end of the adjustment period, but in the 25% group, it decreased to 105 m, and in the 50% group, it decreased to 70 m.

Plyometric exercises: In the training volume reduction period, the control group training program Did not change. According to the number of repetitions and periods of the eighth week, the training was continued until the end of the adjustment period. Still, the number of cycles in the group decreased from 25% to four to 25 cycles in movement and in the group, 50% from four to two cycles in motion.

Playing in small groups: During the period of reducing the training volume, the training program of the control group did not change according to the number of sessions in the eighth week until the end of the adjustment period, but the number of sessions in the group was 25% from four to three. Decreased in motion, and the group 50% reduced in activity from four to two. Statistical methods for describing the obtained data, for each of the research variables, frequency, mean and standard deviation used) (Table 3). Calmograph-Smirnov test was also used to determine the homogeneity of data. Due to the normal distribution of data, a correlated t-test and one-way analysis of variance were used to analyze the findings. If significant results are observed. Bonferroni post hoc test was used, and statistical calculations were performed by SPSS 20 software at a substantial level (P (05.0)).

Findings

The basic information obtained from the subjects, including age, height, is summarized in Table 2. Correlated t-test results have been reported for in-group comparison of variables in the stages before and after training adjustment in different groups. As can be seen, granulysin did not change significantly, while the number of leukocytes before lymphocytes and (t = 11.6 and P = 0.0001) 50% adjusted exercise, t = 67.2 and P = 0.02) 25% exercise Adjustment after and before had a significant decrease (t = 251.4 and P = 0.02) (50% adjustment exercise), t = 928.2 and P = 0.01) 25% adjustment exercise from the dimension and showed an increase) t = 141.7 and P = 0 / 0001), (t = 0.388 and P = 0.7) group control in order to show and show increase (t = 141 and P = 0.0001), (t = 0.388 and P = 0.7).

Table 2 Descriptive characteristics of the subjects (mean ± standard deviation)

Variable	**Age (Years)**	**Height (Cm)**	**Sports History**
Groups			
Control	26,54 ± 3.2	176.90± 5.9	10.22±1.21
Exercise Adjustment 25 %	26.36 ±3.07	177.09± 5.37	10.36±1.2
Exercise Adjustment 50 %	26.09 ± 2.84	177±5.32	10.45±1.03

Table 3 Statistical description of granulosin, leukocytes and lymphocytes (mean ± standard deviation)

Groups	Exercise Adjustment 25 %	Exercise Adjustment %	Control
Before Training	2.29±0,26	2.25±0.27	2.28±0.26
Before Adjustment	4.10±0.48	4.14±0.44	4.11±0.48
After Adjustment	4.40±0.72	4.21±0.46	4.71±0.72
Before Training	5300±624.9	5270±567.74	5280±669.65
Before Adjustment	6880±808.01	6650±795.01	6500±702.37
After Adjustment	6230±1308.13	5730±692.90	6930±761.65
Before Training	2400±377.12	2380±345.76	2420±385.15
Before Adjustment	2960±416.86	2880±537.7	2770±529.25
After Adjustment	2580±620	2450±494.44	3110±438.3

Correlated t-test was used for in-group comparison of granulosin, leukocytes and lymphocytes in the subjects. The results showed that the values within the group of granulosin before training compared to after adjustment were significant (t = 0.388 and P = 7.7) control and (t = 30.353 and P = 0.7) 50% adjustment training) t = 0 566 and P = 0.5) 25% was not exercise. Intragroup values of leukocytes before training compared to after training adjustment 25) P = 0.02 and t = 2.67

Modification exercise 50% (t = 11.6 and P = 0.0001)

Control was significant (t = -146 and P = 0.01).

Also, the intragroup values of lymphocytes before exercise compared to after adjusting for training were 25 (P = 0.01% and t = 2.928% (and exercise adjustment was 50%). T = 25/4 and P = 0.02 For a one-way comparison between granulysin, leukocytes and lymphocytes, a one-way analysis of variance test was used.

Granulosin levels were not significant between groups (P = 0.8 and F = 0.11. Leukocyte counts (P = 0.03, F = 3.93) and lymphocytes (P = 0.02 and F = 4.40). The Bonferroni post hoc test showed that the difference observed in leukocytes between the control group and exercise modulation was 25% and 50%. In lymphocytes between the control group and exercise, modulation was 25% and 50%, respectively.

Conclusion

This study aimed to investigate the effect of 25 and 50% exercise adjustment after eight weeks of selected exercises on the index the cellular safety measures of male soccer players have been performed. In the research background, it should be noted that no cells were performed as far as the review, an in-house study on the effect of exercise modulation on granulysin changes and some safety indicators. In other studies, a small number of articles related to the subject were obtained.

The results of the present study showed that the intragroup values of granulysin in the exercise modification groups were (25% reduction in volume exercises) and exercise adjustment groups 2) 50% reduction in exercise volume) compared to the control group, 5.9 and 2.61% increased but was not statistically significant.

On the other hand, the difference between the groups indicates that this index's change in the subjects after participating in the exercise adjustment was not statistically significant.

The present study's findings are consistent with the results of Zang et al. does not match. The intensity and duration of sports activities are relevant. Sicily et al. Examined granulysin as an indicator they increased the training load in Time Trail cyclists. Five weeks of average time trial training was performed afterwards.

Subsequently, after four days of heavy training and from the fifth day onwards until the end of the average week, the results show that the granulysin concentration increased after five weeks of time-trial training and the granulysin attention during the intense training period was significantly higher than the baseline. It was less. This study showed that plasma granulysin concentrations increased during moderate training and decreased in response to a period of intense exercise [9].

Zang et al. Reported that the serum concentration of granulysin remained unchanged after strenuous activity, whereas the number of NK cells in the bloodstream increased [7]. Focal et al. Increased the expression of granulysin gene in blood cells 2 to 3 times. However, this increase is still unclear with increasing blood granulysin concentration [10]. The present study also showed eight weeks of selected football training caused a significant increase in granulysin, and subsequently, two weeks of training volume decreased by 25 and 0.50 compared to before the training adjustment. Previous studies have shown that increased granulysin levels are due to the activation of NK and CTL cells. Increased levels of catecholamines and stimulation of beta-adrenergic receptors during exercise also increase NK cells. As the results of the present study showed, following two weeks of exercise modulation in exercise modulation groups 1 and 2 granulosin decreased, which was 2 (50%) higher in the exercise adjustment group, but was not statistically significant, probably due to the duration and intensity of the exercise adjustment. Therefore, the modulation used may not have been of the required power or course. On the other hand, this lack of modification may be due to the inhibitory effect of stress hormones such as cortisol, epinephrine and prostaglandins (also modulating the activation of NK cells) and reduced CTL.

Athletes' training status before the start of the training adjustment period and the reduction of training load in the training adjustment period are other essential factors in the effectiveness of the training adjustment period. In the present study, the lack of granulysin change in the experimental groups during the training adjustment period can be attributed to the insufficient training stimulus in the pre-training adjustment period or the short eight-week period for the necessary adaptations. An unreasonable increase in control group granulysin and a minor decrease in 25 and 50% exercise adjustment group granulysin can confirm. The probabilities are stated. Adjustment and more prolonged duration may be needed to reduce granulysin in exercise modulation groups and return to baseline granulysin levels.

For example, increased production of free radicals, which is associated with a significant increase in aerobic metabolism during exercise, can in itself inhibit immune responses. As a result of neutrophil activation and curvature, activation and redistribution of blood to tissues (e.g. Intestine (2) increase in nitric oxide (NO) (1 xanthine oxidase endothelium) Ischemia during exercise may also produce other radicals (free radicals inhibit the displacement and bacterial activity of neutrophils and NK cell-cell activity). Slow and proliferation of lymphocytes reduces T and B. Exercise modulation appears to be associated with positive regulation of antioxidant defence. However, these observed changes are immunologically insignificant. In addition, Zhuravlyova et al. Central

temperature during exercise increase cortisol by more axial stimulation of the renal hypothalamus, so due to the effect of cortisol on the immune system, increased cortisol levels can be one of the causes of leukocytosis (shown to be the leading cause of leukocyte accumulation during exercise Exercise is due to increased cardiac output, plasma levels of catecholamines and cortisol [11].

Studies show that high leukocytes and lymphocytes during exercise as part of the response. According to the present study, the number of leukocytes and lymphocytes in the exercise-adjusting groups decreased compared to the control, which indicates a decrease in inflammation following exercise-adjusting. The number of lymphocytes increases progressively with increasing workload (lymphocytosis), and the amount depends on the type, intensity of exercise. A decrease of 0.50 (a more significant reduction in volume than the tipping group 1) decreased 0.25. One of the weaknesses of the present study was the lack of precise control of diet and management of other physical activities. More research is needed to determine whether exercise modulation can affect the immune system, whether granulysin changes in the circulation, and whether an increase in granulysin can indicate exercise load.

Discussion

This study showed that modulation of two-week training caused a significant decrease in leukocytes and lymphocytes but had no significant effect on granulysin levels. It seems that tipping, if done at the right time and in the required amount, can have beneficial effects on the immune system index of athletes and that the 50% adjustment of training had a more significant reduction than the 25% adjustment in leukocytes and lymphocytes. Modifying training is an excellent strategy to improve the immune system and reduce inflammation after a period of high-pressure training in football players.

References

1. Vachon, A., et al., *Effects of tapering on neuromuscular and metabolic fitness in team sports: a systematic review and meta-analysis.* European journal of sport science, 2021. **21**(3): p. 300-311.
2. McKay, A.K., et al., *Iron metabolism: interactions with energy and carbohydrate availability.* Nutrients, 2020. **12**(12): p. 3692.
3. Song, Y., et al., *Benefits of exercise on influenza or pneumonia in older adults: a systematic review.* International journal of environmental research and public health, 2020. **17**(8): p. 2655.
4. White, A., et al., *Match-play and performance test responses of soccer goalkeepers: A review of current literature.* Sports Medicine, 2018. **48**(11): p. 2497-2516.
5. Lim, M.A. and R. Pranata, *Sports activities during any pandemic lockdown.* Irish Journal of Medical Science (1971-), 2021. **190**(1): p. 447-451.
6. Karampatzakis, A., *CD16 shedding regulates serial killing and responses to immunotherapies*. 2021, The University of Manchester.
7. Wang, B., et al., *Synergetic inhibition of daidzein and regular exercise on breast cancer in bearing-4T1 mice by regulating NK cells and apoptosis pathway.* Life sciences, 2020. **245**: p. 117387.
8. Friedman, D., *The impact of substrate stiffness on Natural Killer cell function*. 2019: The University of Manchester (United Kingdom).
9. Pryor, J.L., et al., *Intermittent exercise-heat exposures and intense physical activity sustain heat acclimation adaptations.* Journal of science and medicine in sport, 2019. **22**(1): p. 117-122.
10. Stamova, B., et al., *Correlations between gene expression and mercury levels in blood of boys with and without autism.* Neurotoxicity research, 2011. **19**(1): p. 31-48.
11. Zhuravlyova, L., et al., *Diseases of endocrine system. Chronic insufficiency of adrenal cortex glands. Etiology, pathogenesis, clinical presentation, diagnosis, prevention and treatment. Acute insufficiency of adrenal cortex glands. Hormonal-active tumors of adrenal glands.* 2013.