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THE COMPARISON OF URINE ZINC VALUES OF FOOTBALLERS IN THE INDUSTRIAL REGION AND OUTSIDE THE INDUSTRIAL REGION

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ABSTRACT

The aim of this study is to examine urine-zinc values of footballers living and doing training in industrial region and footballers living and doing training outside industrial region.

In the research,14 amateur footballers , whose age-average is 24,00 ± 3,46 year, height-average is 1,76 ± 0,05 meters, body weight average is 70,79 ± 6,70 kg and sports-age average is 11,71 ± 3,49 year and who do training in industrial region and 10 amateur footballers , whose age-average is 20,40 ± 0,84 year, height-average is 1,75 ± 0,07 m, body weight average is 69,70 ± 7,81 kg, sports-age average is 6,50 ± 1,84 year and who do training outside industrial region , were participated voluntarily.

One tube of urine specimen was taken from the footballers participated in the research. The urine specimen taken was analyzed in Biochemistry laboratories through Anodic Stripping Voltammetry (ASV).

A statistical difference has been determined between zinc values of footballers participated in the research considering their doing training in industrial region and outside industrial region. ($P<0,05$).The zinc values of footballers living and doing training in industrial region have been found to be higher than the zinc values of footballers living and doing training outside industrial region in the research.

To conclude, it is thought that the trace elements in human body are affected by working and living environment and as well, it can be said that this situation should be taken into account by the trainers.

Key words: industrial region, zinc, footballer.

INTRODUCTION

Many minerals considered as essential (materials that body can't produce and should be taken from outside) are necessary for organism's doing its function healthily (B.L.Vallee, K.H.Falchuk, ,1993). Although zinc, being one of these elements, ranks number 23 considering the position of being on earth, it is commonly used in biology. So indeed, zinc is the only metal being in each enzyme class. As a natural result of this, it exists nearly in every cell of body (B.L.Vallee, D.S. Auld, 1989). 1.4-2.3 gr zinc exists in an adult male and 60 mg zinc exists in a newborn infant. % 80-90 of all body zinc exists in muscles, skin and bones, but it doesn't form a storage since its mobilization is limited (Y.Üçkardeş, 2006).

Since zinc is necessary for many enzymes in metabolism, a serious zinc absence will affect muscle functions negatively. A low muscle-zinc level will decrease the capacity of endurance as a result (A. Cordova, AlvaM.rez-Mon,1995). Zinc doesn't have a very special storage like iron as well as its toxicity is low. So taking zinc regularly through a diet is needed. For the continuation of zinc level, zinc loses with sweat, urine and similar ways should be replaced (A.S.Prasad,

et all., 1993). It was reported clearly that physical exercise affects zinc metabolism (M. Marrella, 1993) and a short-time exercise has an effect on zinc metabolism (A. Cordova, M. Alvarez-Mon, 1995). Trace mineral zinc has an important role on endocrine and immunity systems. Zinc mostly exists in liver and it is stored as an independent enzyme in musculoskeletal system. Physical exercise may affect antioxidant enzymes like CuZn-SOD and Mn-SOD. But its effect on regular acute exercise and physical activity is disputable **(C.** Nakao, 2000). Nowadays, it is known that zinc has important roles in metabolic events, protein, carbohydrate, energy, nucleic acid, lipid and hem synthesis, gene expression, immune system maturation, tissue synthesis and embryogenesis (A. Karadağ .,2006).

Therefore, it is aimed in this study to compare urine-zinc values of footballers doing training in Middle East Industry-Trade Center (MEITC) and footballers doing training outside MEITC.

MATERIAL AND METHOD

In the research, 14 amateur footballers, whose age-average is 24,00 ± 3,46 year, height-average is 1,76 ± 0,05 meters, body weight average is 70,79 ± 6,70 kg and sports-age average is 11,71 ± 3,49 year and who live and do training in Ankara MEITC region and 10 amateur footballers , whose age-average is 20,40 ± 0,84 year, height-average is 1,75 ± 0,07 m, body weight average is 69,70 ± 7,81 kg, sports-age average is 6,50 ± 1,84 year and who live and do training outside MEITC region, were participated voluntarily.

Footballers participated in research had the same physical level. Because, when the research was carried out was the competition term. One tube of urine specimen was taken from the footballers participated in the research when they were rested during competition season. The urine specimen taken was analyzed in Gazi University Education Faculty Biochemistry laboratory through Anodic Stripping Voltammetry (ASV).The gotten results were recorded in computer environment

Statistical Analysis

SPSS 10,0 packet program was used in the analysis of the gotten data. The data were abstracted through average and Standard deviation. T test was used in independent groups in comparison of urine-zinc values of footballers living and doing training in industrial region and footballers living and doing training outside industrial region. The error level was evaluated as 0.05 in this study.

RESULT

Table 1. Physical characteristic data for the test subjects.

Variables	*Footballers in industrial region* ***(n = 14)***	**Footballers in outside industrial region (n = 10)**
	M ± SD	M ± SD
Age (year)	24,00±3,46	20,40±0,843
Body height (m)	1,76±0,056	1,75±0,078
weight (kg)	70,79±6,70	69,70±7,81
Sport of Experiences age	11,71±3,49	6,50±1,84

When table 1 was examined, it has been determined that age-average is 24,00 ± 3,46 year, height-average is 1,76 ± 0,05 meters, body weight average is 70,79 ± 6,70 kg and sports-age average is 11,71 ± 3,49 year of the footballers doing training in industrial region and age-average is 20,40 ± 0,84 year, height-average is 1,75 ± 0,07 m, body weight average is 69,70 ± 7,81 kg, sports-age average is 6,50 ± 1,84 year of the footballers doing training outside industrial region.

Table 2. The comparison of urine zinc values for footballers.

Variables	***N***	***Mean***	***SD***	***St. Eror***	***Difference means***	***t***	***P***
Footballers in outside industrial region (μgl^{-1})	**10**	**1,5040**	**0,3554**	**0,1124**	**1,2810**	**3,401**	**0,003***
Footballers in industrial region (μgl^{-1})	**14**	**2,7850**	**1,1458**	**0,3062**			

*P<0,05

When table 2 was examined, a statistical difference has been found in comparison of zinc values of footballers doing training in industrial region and footballers doing training outside industrial region. ($p<0,05$) The zinc values of footballers doing training in industrial region have been found to be higher than the zinc values of footballers doing training outside industrial region in the research.

Discussion and conclusion

In this study aiming the comparison of urine-zinc values of footballers doing training in industrial region and footballers doing training outside industrial region, a statistical difference has been found between zinc values of footballers participated in research considering their doing training in industrial region and outside industrial region ($p<0.05$). In the research which Pizent et al. (2003) carried out over 156 control group and 299 healthy men aged 20-25 and living in industrial region in Zagrep and being exposed to zinc, copper and cadmium elements, they reported that these elements had an important effect on serum concentration (Al.Pizent, J. Jurasoviç, S. Telisman, , 2003). In this study which was carried out with the aim of determining if there was a difference between the trace element levels in 24 –hour urine of the workers in Cinkur and the trace element levels in urine specimen of control group and examining the effects of working environment on trace element amounts in human body, the elements such as Fe, Zn, Pb, Mn and Cu in 24-hour urine of the study group were observed to be statistically higher at a significant level than the control group (Y. Yagmur, 1994). In a research which was carried out over male workers having no illness in Black sea Copper Operations Joint Stock Company Samsun Operation management, no difference in copper and zinc levels in people in the company was observed compared to the people outside the company. The result why copper and zinc levels are normal may result from plasma levels' being unable to show body copper and zinc situation entirely S.Aslan, 1999). E. Kara (2007) carried out a zinc application over 20 young male wrestlers and determined that serum and zinc levels measured after application increased significantly compared to the ones before application and showed that zinc application activated antioxidant system in athletes (E.Kara, 2007). In the study which C.J. Koury et al. (2004) carried out over triathletes, sprinters, marathoners and short-long distance swimmers, whereas a significant decrease was observed in plasma zinc values of triathletes, an increase was observed in erythrocyte zinc values during the comparison of triathletes to other groups ($p<0.01$) (C.J. Koury, Oliveira De Va, et all.,2004). It is known that exercise changes zinc density a lot in circulation. Physical activity includes soft tissue trauma and also affects plasma zinc concentration. Plasma and serum zinc density increase immediately after the exercise with short, dense and long-term endurance exer cise (C.H.Lukaski,,2000**).**

To conclude; in this study carried out , zinc values of footballers living and doing training in industrial region have been found to be higher than the zinc levels of footballers living and doing training outside industrial region. Therefore, it is thought that the trace elements in human body are affected by working and living environment and as well, it can be said that this situation should be taken into account by the trainers.

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THE INVESTIGATION OF THE RELATIONSHIP BETWEEN PHYSICAL PERFORMANCE and LUNG FUNCTION TESTS AT SPORTSMEN

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ABSTRACT

Importance of exercise in measuring the sportive performance of the sportsmen has been increasing in recent years. Therefore, lung function and exercise tests have been quite attractive for the researchers in specifying the appropriate sportsmen and evaluating their pre-seasonal performance.

This research has been planned to specify the relationship between the lung function and exercise tests of the footballers and basketballers playing with Diyarbakir Amateur Group and identify the differences between them and those not engaged in sports (the sedantery).

All groups were taken through the physical performance test and the time they completed the running distance was specified. Yet, spirometric measuring as lung function tests of all individuals was taken.

According to the outcomes of this study, the Vital Capacity, one of the static parameters of the lung was found high due to the control group of the basketballers ($P < 0,05$). The dynamic respiration parameters of the basketballers FEV1/FVC, MVV values ($P < 0,001$) and FEF%25 of the basketballers were found to have considerable difference with those of sedentary.

Whilst the increase observed with FEV1/FVC ratio and MVV with footballers, the FEV1 and FEF%25 value was found to be rather high as $P < 0,05$.

Whilst no difference between the time to cover the running distance between basketballers and sedentary was specified, this time period was found to be rather low with footballers compared with other two groups.

It was concluded that lung function tests are required to be handled together with skill and coordination tests in evaluating the competence and the performance of the sportsmen.

Key Words: Basketball, football, physical performance, spirometric tests.

Introduction and purpose

Sport has become a major social event nowadays. Sport maintains its development as an important sector via planning made in accordance with scientific principals. Besides, it can also be evaluated as gaining the habit of regular exercising which is important in terms of health. The aim of people dealing with sport is to develop physical and mental health, to provide the sense of self-confidence and to achieve the ultimate performance.

In recent years, the perception of the importance of sport for the health of both the individual and the society resulted in positive developments in sport sciences. Exercise physiology which is an important branch of the sport science also developed with a great acceleration in parallel with these developments and became one of the most important subjects in terms of sport.

The importance of regular exercise for health is clarified each passing day. Exercises enable the muscles, bones, articulations and cardiovascular system to function most properly.

Making sport regularly and for a long period increases the cardio-respiratory activity. Physiological properties that are specialized according to sport constitute the basic components for successful sport performance. Effective inspiratory capacity and physical appropriateness are the principal ones. In this context, determination of inspiratory capacity and application of improving exercise methods have become a crucial event in modern sports. Spirometrical measurements which give information about the resistance of air lines and air stream speeds and which are made in order to show the competence of the pulmonary function are frequently used in respiratory function laboratories.

This study is planned in order to determine the response of the football and basketball players in Diyarbakır amateur group to lung function tests and exercise tests and in order to put forward their difference from the sedentaries who do not make sport regularly.

Scope

Since both offence and defense systems are interbedded in sports of football and basketball and since the games are exciting, contentious and there is a struggle in close contact, every moment of watching the games give excitement to the spectators. Aside from depending on technical intelligence and mental factors, basketball and football games are sports that also require anthropometric and physiological parameters. Anatomic appropriateness, physiological strength and condition are not only the complement of team cooperation, technique and tactic but they are also an important effect in showing technical skill and in withstanding injuries and mutilations. Outstanding structural adjustment and physical strength are necessary to be successful and keep pace with the football and basketball of our day which is played in high tempo.

Today, team sports like basketball and football are more contentious and depend more on physical strength. When we analyze 1980s and 1990s, games in those periods depended more on technique. Coming to 2000s, that understanding changed and is replaced by another understanding which is completely different and which prioritize physical strength. Thus, in such team sports, more strong and powerful players in all aspects have began to be needed in order to obtain equity and superiority. The definition of athletically strong and powerful player is described as someone whose engine properties are developed (fast, swift, enduring) and who have the physical ability, muscle structure and a maximal inspiratory capacity that his/her branch requires. Therefore, along with the changing understanding of sport and type of struggle, training models and methods also show changes day by day. Together with the changing models, training methods that improve physical strength, include muscle work out appropriate to the branch and increase inspiratory capacity started to be applied in all branches and categories from amateur teams to professional ones. All these studies and measurements aim to use more objective determiners in player selection by determining the most appropriate anthropometric, physiologic and psychological properties for basketball, football and all sport disciplines.

In the light of all these improvements, basketball and football have become very attractive sport branches for researchers.

This research is carried out with 45 volunteer individuals from Güneydoğu Dicle Basketball Club, Yolspor Footbal Club and sedentaries from peer groups.

Material and method

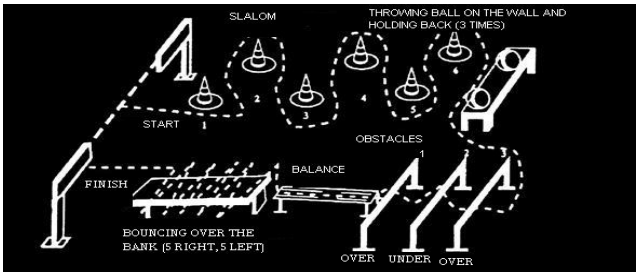
In order to form the test groups, 15 basketball players (age: 16.80 ± 0.14) in amateur league level and 15 footballers (age: 16.87 ± 0.34) were included in the study. Besides, a control group was formed with 15 peer sedentary individuals (age: 17.27 ± 0.27). All of the experimental subjects are males and they have been playing actively in the related branches for 5 years. The sedentary individuals who are the control group have not performed actively in any sport activity until today.

The study is comprised of two stages;

- Physical Performance Test (Skill and Coordination Test)
- Lung Function Test

In the first stage, the subjects are tested in the skill and coordination track prepared for them. This stage depends on the principle of subjects' completing the skill track racing against time. While preparing the track, it is taken into consideration that the test would not be peculiar to only one branch but it is aimed that the track would determine the skill, coordination, balance, speed, swiftness and flexibility of the sportsmen and sedentaries in general. Arterial blood pressures and hematocrit values of the sportsmen were measured before the physical test. In order to determine the hematocrit values, blood samples were taken before the exercise and preserved in capillary tubes. These blood samples that were preserved in tubes were later centrifuged and the hematocrit values of the subjects were determined.

Figure 1 - Skill and Coordination Track



As for the second stage, the subjects were taken to the laboratory and their spirometrical tests were performed. In order to avert the factors such as device adaptation problem, excitement and stress, pilot tests were performed before the main test. In the following stage, it was passed to the measurements.

All measurements were carried out in accordance with ATS (American Thoracic Society) criteria. Biometrical properties of the subjects were taken as basis while determining the predictive values of the parameters.

In the statistical evaluation of the results, SPSS 16.0 For Windows package program was used. The results were tested via Analysis of Variance (ANOVA). LSD method was used in the Post Hoc evaluation of the differences between groups.

Findings

In Table-1 the biometric properties (age, height, body weight) of individuals are compared. According to that, while there is not a meaningful difference between the groups in terms of age and body

weight, it is determined that the basketball group individuals' heights are significantly higher in proportion to the control and football groups ($p<0.001$).

The hematocrit values and systolic and diastolic blood pressures of all individuals are shown in Table-2. There is not a meaningful statistical difference between the groups in terms of these parameters ($p>0.05$).

In Table-3 the respiratory parameters of all groups and comparison results of track completion duration average values among groups are shown.

According to that, Vital Capacity value which is one of the statistical parameters of lungs is determined to be significantly high only in basketball group individuals compared to the control group ($p<0.05$).

Taking dynamic respiratory parameters of lungs into consideration, a significant statistical difference is determined when FVC1, FVC1/VC, MBC values ($p<0.001$) and MFRE values ($p<0.01$) in basketball group is compared to the control group.

As for the footballer group, while there is an increase in FVC1/VC rate and MBC value compared to the control group, FVC1 and MFRE value is found to be higher in a $p<0.05$ rate importance.

When the individuals are handled in terms of physical exercise tests, it is determined that the track completion durations of footballers are significantly lower than both control and basketball groups ($P < 0.001$ and $P < 0.05$ respectively). There is not a significant difference between the basketball group and control group individuals in terms of track completion duration.

Table 1 – Comparison of the biometrical properties of basketball, football and control group individuals

GROUPS	AGE (year) $\bar{X}$ ±SE	HEIGHT (cm) $\bar{X}$ ±SE	BODY WEIGHT (kg) $\bar{X}$ ±SE
CONTROL	17,27 ± 0,27	177,47 ± 1,25	73,47 ± 1,76
BASKETBALL	16,80 ± 0,14	187,07 ± 1,44*Δ	74,53 ± 1.63
FOOTBALL	16,87 ± 0,34	175,20 ± 1,05	70,33 ± 0,97

*; Statistical importance of the difference when compared with the control group
$p< 0.001$, ($x \pm SE$).
Δ; Statistical importance of the difference when compared with the footballer group
$p< 0.01$, ($x \pm SE$).

Table 2 – Comparison of the Hematocric value, systolic and diastolic pressure average value among groups before the physical test.

GROUPS	HTC (%)	SP (mmHg)	DP (mmHg)
CONTROL	43,20 ± 0,30	126,33 ± 4,79	73,33 ± 1,59
BASKETBALL	44,07 ± 0,34*	125,67 ± 4,52*	72,67 ± 1,53*
FOOTBALL	43,47 ± 0,33*	123,67 ± 3,95*	76,00 ± 1,84*

*; Statistical importance of the difference when compared with the control group
$p > 0.05$, ($x \pm SE$)

Table 3 – Respiratory parameter values and track completion durations of all groups.

GROUPS	FVC1 (L)	FVC1/VC (%)	MFRE (L/sec.)	MFRME (L/sec.)	MBC (L/min.)	TV (L)	ERV (L)	IRV (L)	VC (L)	TCD (sec.)
CONTROL	3.04 ± 0.06	76.94 ± 0.54	4.11 ± 0.13	3.76 ± 0.11	103.64 ± 1.10	0.68 ± 0.04	1.31 ± 0.05	1.97 ± 0.04	3.96 ± 0.06	35.46 ± 0.61
BASKETBALL	3.45 ± 0.07***	82.99 ± 0.63***	4.75 ± 0.18**	4.13 ± 0.19	114.70 ± 2.48***	0.71 ± 0,04	1.43 ± 0.07	2.05 ± 0.04	4.19 ± 0.08*	34.09 ± 0.48?
FOOTBALL	3.28 ± 0.08*	82.61 ± 0.72***	4.61 ± 0.14*	3.74 ± 0.12	114.64 ± 2.71***	0.67 ± 0,03	1.31 ± 0.05	2.03 ± 0.03	4.00 ± 0.07	32.31 ± 0.42***

***; Statistical importance of the difference when compared with the control group; $p< 0.001$,(x ± SE),
**; Statistical importance of the difference when compared with the control group; $p < 0.01$, (x ± SE),
*; Statistical importance of the difference when compared with the control group; $p< 0.05$, (x ± SE).
Δ; Statistical importance of the difference when compared with the footballer group; $p < 0.05$, (x ± SE).

Discussion and conclusion

In order to research if there is a correlation between the physical performance test values and respiratory functions of sportsmen from different sport branches, individuals in youth category consisting of basketball players, footballers and control groups whose ages range between 15–19 are included in the study.

The physical performances of individuals are evaluated on the basis of their completion durations of the prepared skill and coordination track. As for their respiratory functions, it was performed by measuring their lung volume and capacities via spirometrical method. After the statistical analysis of the acquired results, it was passed on to the comment stage.

In course of the literature scanning we made before starting the study, we noticed that there are many studies available on the physical performances of the sportsmen; however, there are not so many studies researching the relationship between the respiratory functions and physical performance tests of the sportsmen. From this point forth, we carried out this study with 45 young male individual consisting of basketball, football and control groups.

According to the results we acquired, it was observed that the respiratory parameters of the footballers and basketball players are significantly high as compared with the control group individuals. Moreover, it was determined that the physical performance tests of the football group individuals are in an advanced level as compared with both basketball players and control group.

Consequently, it can be said that there is a positive relationship between the respiratory functions and physical performance tests of the sportsmen. We are of the opinion that taking some physiological parameters into consideration in parallel with the sportive skills while selecting players would be beneficial in order to increase sportive success. However, we consider that some more comprehensive researches must be done in order to make an ultimate judgement.

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INFLUENCE OF JUMPING EXERCISES ON THE DEVELOPMENT OF EXPLOSIVE POWER AT HANDBALL AGED 12 -13 YEARS

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ABSTRACT

Objective. Jumps exercises put in handball training are o good method to develop the as it can be remarked on this essay our intention is to develop the vertical detachment of twelve-thirteen years old (12-13) boys, knowing the fact that the force can not be developed by bar bells at this age.

Research Methods and Procedures. The research was conducted over 6 months, TI has made in September 2005, and the TF in February 2006. The trainings were held both outdoors and in both groups by training room is under the same conditions, the difference exists only in the fundamental experiment in group training where exercises were introduced themselves (which included the independent variable) for the development of explosive power .

The difference in driving systems of the two groups was the application for development exercises explosive power of the experimental group. Otherwise drive systems have followed the general physical and driving qualities, the same for both groups. In the number of training sessions were conducted three workouts per week that was identical for both groups so that the second training experiment group contained the independent variable.

Results. On the experimental group will see the results of subjects in the 3 successive jumps (541.667 ± 21.197 baseline and after six months 573.75 ± 18.563; at a threshold of significance $p \leq 0.0005$), vertical detachment on two legs (33, initial 75 ± 2.179 and 40.917 ± 2.61 after six months, at a threshold of significance $p \leq 0.0005$) foot vertical separation of battle (42.25 ± 2.094 initially and after six months 48.833 ± 2.368; at a threshold of significance $p \leq 0.0005$) increased due to implementation of training programs that contain the independent.

Discussion and Conclusions. Assuming the paper, the behavior of the dependent variable (distance traveled during the long jump 3 successive away with two feet vertically and on foot fighting) in the two groups (experimental group and control group), resulting in application independent variable (placing in training exercises for jumping).

Confirmed the hypothesis, that the method of jumping to handball novice influence of performance of subjects in the experimental group on the distance traveled during the 3 successive jumps, two feet vertical separation and vertical separation foot battle.

Key words: handball, detention, jumping exercises

Introduction

Modernization sport is a complex process of reassessment, the reassessment of what has proved and still proves valuable, and introducing new features requested by current guidance (D. COLIBABA - EVULEŢ, 1998). Continuous modernization of sport must find new methods, procedures and capacity to act in practice and continuous improvement of existing ones, those so-called classical In line with this task of great importance to sports we have developed this work aimed at achieving the higher odds of a goal important enough in general physical training novice athletes namely motor skill development and in particular the development of detention (G. RAŢĂ, B. RAŢĂ, 1999).

Almost impossible due to increased performance (that can not provide results of high level of skills young people have not even above average) to find the most appropriate methods and means of developing a task, and detention is a concern of many experts.

The purpose and tasks work

The purpose of the present work was observed jumping exercises influence on the development of detention at a beginner handball group consists of boys aged 12-13 years. Starting from the initial test is to measure the distance traveled during the three jumps chain, measuring the vertical detachment both run on two feet and breaking the leg of stroke and 6 months after final testing is accomplished in the same conditions as initial testing to see if they have had influence on the performance achieved by the distance traveled during the three jumps chain, the detachment foot vertical separation battle and, in a word on explosive power.