32. FITNESS ASSESSMENT

P-090 Dynamic balance and posture in visually impaired soccer players

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OBJECTIVE Soccer is the most popular sport in all over the world, not only for the sighted people but also for the visually impaired. Visually impaired people can do almost all kinds of sports like their sighted peers unless they have other disabilities. However, they may have some postural and balance problems due to lack of vision. The purpose of this pilot study was to investigate the relationships between dynamic balance and posture of visually impaired soccer players.

METHODS 7 visually impaired soccer male players (mean ages 21.42) voluntarily participated in this study. Spinal mouse device was used to measure the number of abnormal vertebrates of players. MED-SP 300 Dynamic Stability Measurement Platform used a circular platform that was free to move in the anterior-posterior and medial-lateral axes to obtain stability index. Spearman's Statistical analysis was used.

RESULTS The results of this study indicated that there was no significant relationship between stability index scores (balance scores) and the number of abnormal vertebras (Spearman's rho = -.13; $p > 0.05$).

CONCLUSION There was no significant relationship between stability index scores and the number of abnormal vertebras. Although soccer for visually impairment players is a new sport in Turkey, it was suggested to perform this study with a bigger sample in the future, smaller sample size hold the risk of non-detection of moderate treatment effects.

KEY WORDS Dynamic balance, visually impaired soccer player, posture

P-091 Motion skills on soft sand and conventional surface in beach soccer

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OBJECTIVE The increasing popularity of beach soccer puts a series of questions about the profile and the motion peculiarities of the beach soccer player. This kind of analysis seems to be necessary for the trainers to recognize the consequences of training performed on sand and on conventional surface. The aim of this study was to investigate the motion skills of beach soccer players on soft sand and conventional surface. Particularly, through the analysis of some performing parameters, it was checked if there were any quantity and quality differences in the running and jumping gestures, when performed on sand and on hard surface.

METHODS The two tests of jump are respectively been performed on platform of strength and on a thickness of 4 cms of sand below which the platform of strength has been situated. Aerobic performance was estimated through Lèger shuttle test,while jump(CMJ)was assessed using twin plates (Globus Italia)with a related software to analyze the different biomechanical parameters on 10 subjects belonging to the Italian beach soccer national team (30±5,8yrs,75,8±5,4Kg,181,8±5,5cm).

RESULTS The CMJ jumping test rates on hard surface and on sand was respectively (average ±sd): 37,7±1,5 cm and 32,8±2,4 cm: the decrease of about 14% showed a statistical reliability of $p<0,01$.Lèger test rates performed respectively on hard surface and on sand showed VMA rates were respectively 13,0±0,5 km/h and 11,1±0,5 km/h.Percent decrease has been about 15% ($p<0.01$)

DISCUSSION The results of this investigation were similar to what was already observed in literature with active subjects. When compared with these ones, which have shown a decrease of about 25% when shifting from hard surface to sand (Bisciotti, 2003), the national team's players are able to reduce such a performance disadvantage, probably because of a better specific suitability to this sport.

REFERENCES
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KEY WORDS Sand test, CMJ Léger test beach soccer.

P-092 Seasonal changes in aerobic fitness of circumpubertal football players

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OBJECTIVE Short periods of aerobic and football specific training (Impellizzeri et al., 2006) have been shown to improve soccer performance during a match. However, less is known about the effect of football training on the cardio respiratory fitness during prolonged periods of time and its development during different puberty stages. The aim of this study was to describe the impact of one year of training on cardio-respiratory fitness parameters in young football players.

METHODS Thirty three football players performed a treadmill incremental test to exhaustion to determine VO2max, maximal aerobic speed (MAS), velocity at ventilatory threshold (vVT1) and respiratory compensation point (vRCP), and 6-min constant-load exercise at vVT1 to determine running economy (RE). Age at peak height velocity (APHV) and time until/from APHV(TPHV) were estimated from anthropometrical data.

RESULTS TPHV was significantly different between G13, G14 and G15 (respectively, -1.2 ± 0.8, -0.2 ± 0.9 and 0.8 ± 0.5 yr, $P < 0.001$) whereas PHV was similar (14.4 ± 0.7, 14.4 ± 0.8 and 14.4 ± 0.5 yr). In addition, G13, G14 and G15 changed in a similar pattern their MAS (Table 1).

Table 1. Results before (Pre) and after (post) one year of football training in 3 different groups of circum-pubertal groups.

	G13		G14		G15		Interaction#
Dependent variable	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	
MAS ($km.h^{-1}$)	14.7(1.3)	16.2(1.1)	15.0(1.3)	16.2(0.9)	15.9(1.5)	16.7(1.4)	p=0.185
VO_2max ($ml.kg^{-}.min^{-1}$)	56.0(3.1)	52.9(3.3)	54.9(5.4)	54.8(5.6)	54.7(5.5)	54.9(7.4)	P=0.201
vVT1 ($km.\ h^{-1}$)	8.0(0.9)	8.5(0.8)	8.5(1.1)	9.5(0.9)	9.0(1.1)	10.1(1.4)	P=0.485
vRCP ($km.\ h^{-1}$)	11.6(1.1)	12.2(1.3)	11.9(0.9)	12.6(0.9)	11.7(1.3)	13.1(1.4)	P=0.608
RE ($ml.kg^{-1}.km^{-1}$)	266(7)	232(27)	287(28)	247(18)	294(22)	246(21)	P=0.202

MAS, maximal aerobic speed; VO2max, maximal oxygen consumption; vVT1, velocity at ventilatory threshold; vRCP, velocity at respiratory compensation point; running economy; #, group x time interaction of a 2-way RM ANOVA.

DISCUSSION One year of football training improved MAS to the same extent in circumpubertal boys one year younger, at or one year older than their predicted age at PHV. This is contradictory with previous findings of Philippaerts et al. (2006) who reported that cardio-respiratory endurance peak development was optimal at APHV. The improvements in RE, vVT1 and vRCP might partly explain the increase in MAS.

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Philippaerts et al. (2006) *Journal Sports Science* **24**, 221-30.

KEY WORDS Physiological testing, maturation, cardio respiratory fitness, football

P-093 Changes in fitness variables of professional Brazilian soccer players in pre-season

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OBJECTIVE In Brazil, very few studies have focused on repeated measurements in professional soccer.These studies are important for knowledge of the phenomena occurred in the Brazilian' pre-seasons. The purpose of this study was to evaluate the changes in fitness profile in a Brazilian professional soccer team in pre-season.

METHODS The subjects were 26 Brazilian professional soccer players.The measures were obtained in two separated stages during pre-season for Brazilian championship (June and July). The battery of tests included measurements of body

mass, height, sum of skinfolds (triceps and subscapula), YoYo Intermitent recovery test, 20-m sprint, Squat Jump Test and Countermovement Jump Test.

RESULTS The pretraining (T1) and post-training (T2) results were compared with paired Wilcoxon Tets. The players were following training programs designed to increase in general fitness. The sum of two skinfolds showed decrease, statistically significant, by the second test occasion. The entire physical test showed increase, statistically significant,in the performance by second test occasion.

Table 1. Descriptive parameters in the two stages.

	T1	T2	p
Age (yrs)	25,0(4,3)	25,1(4,5)	
Body Mass (kg)	73,6(7,6)	73,4(7,1)	0,116
Heigth (cm)	177,6(6,3)	177,6(6,4)	0,443
Sum skinfolds(mm)	17,0(4,6)	15,31(3,1)	0,004
YoYo (mm)	515,4(109,9)	630,8(138,2)	0,000
20-m sprint (s)	2,97(0,10)	2,94(0,08)	0,010
SJ (m)	35,5(3,6)	36,9(3,5)	0,000
CMJ (m)	40,6(4,3)	41,9(4,3)	0,000

CONCLUSION The results demonstrated that the elite Brazilian soccer players experienced significant improvements in body composition, ability to recover after intense exercise, speed and explosive muscular strength in 6 weeks of pre-season.

KEY WORDS Soccer - pre-season - fitness - anthropometry.

P-094 Follow-up of the training process of a macedonian first league professional soccer team with heart rate and blood lactate monitoring

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OBJECTIVE Intermittent loading improves functional capacity of soccer players. High intensity interval loading includes a short exercise period that is long enough to improve the performance of athletes. Such training recycles lactate at active muscles after high intensity loading. The primary objective of this research was to determine the dynamics of: Pulse frequency, maximal oxygen usage, blood lactate, muscle mass, and body fat percentage of professional football players of Macedonian first league football players at three different time periods.

METHODS Anthropometric measurements were conducted using international methods. VO_2 max was measured on a treadmill according to Bruce protocol. Heart rates were recorded using Polar watches. To measure the bioenergical threshold, the Conconi test was utilized. Plasma lactate levels were recorded using the colorimatic enzymatic method described by Lange.

RESULTS Significant statistical difference was found for relative fat at under skin tissue measurements. Differences were observed between periods I and III, and II and III. Significant statistical correlation was found between variables VO_{2max} and KLA3 in pre-preparation period at phase I measurement.

CONCLUSION Morphological variables of Macedonian soccer players and other nation's soccer players were similar. Body fat percentage of Macedonian players was slightly different. Macedonian soccer players had low level of education on nutrition and recovery methods that directly affected their sports performance. Friendly games and insufficient strength training sessions during the preparation period lead to a decrease in muscle mass of soccer players.

KEY WORDS Soccer, interval training, heart rate frequency, lactate

P-095 Effects of concentrated charges of strength training on anaerobic variables and body composition of professional soccer players

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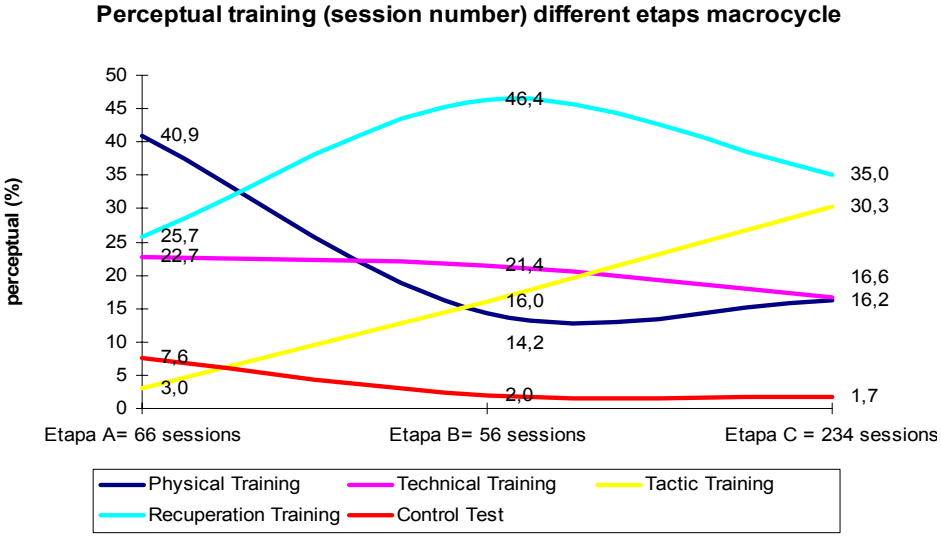
OBJECTIVE Soccer is characterized by interaction of intense and short duration movements, which show the importance of physical preparation for the performance in the game. The aim of this study was to analyze if the contemporary methodology of concentrated charges of strength training modified anaerobic variables and the body composition of the professional soccer players subjected to four evaluations in different moments of the training macrocycle.

METHODS Twenty-one professional Brazilian male soccer players, mean age 23,6± 2,1, and weight 76,6± 8,6 kg participated. The concentrated charges of strength were used as the strength training protocol. The Wingate test (Bar-Or, 1987) was used and to assess body composition (Faulkner, 1968). The training macrocycle lasted six months.. Statistical analyses were ANOVA One Way, supplemented by the Tukey HSD post hoc test ($p<0,05$).

RESULTS The variables PA, PR has got statistically significant positive alterations in moments 1 to 4, 2 to 4 and 3 to 4. The variable MCM has got significant positive alterations in moments 1 to 2 and 1 to 4. The variable (%G) has got significant positive alterations in moments 1 to 2, 1 to 4 and 3 to 4.

Table 1. Descriptive evaluation anaerobic and anthropometric variables included measures of central tendencies and scattering, and the variation analysis Anova One Way for repeated measures, supplemented by the Tukey HSD post hoc test.($p<0,05$) (n=21).

	1	2	3	4	p
absolute anaerobic power (Watts)	900,2(172,3) b	899,2(157,7) c	955,6(153,4) d	955,5(190,83)	0,003*
anaerobic power relating to the body mass (W/kg)	11,90(1,30) b	12,0(1,12) c	12,14(1,11) d	12,60(1,60)	0,008*
fatigue Index (%)	50,7(9,6)	50,52(7,20)	51,33(8,9)	50,80(10,80)	0,84 (n/s)
body mass (kg)	61,60(5,61) ab	62,63(5,60)	62,25(4,91)	63,0(5,0)	0,0001*
body fat percentage (%)	11,30(1,64) ab	10,70(1,30)	10,94(1,50) d	10,46(1,20)	0,0000*



CONCLUSION The significance level which was effective, once that it made possible a punctual subsequent lasting effect of the training (EPDT) manifestation in the final moments of the competition, in the variables PA, PR, MCM and %G. The variable IF was the only one, which didn't present statistically significant positive alterations in the different moments of the evaluation.

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KEY WORDS Soccer, anthropometry, anaerobic capacity and power, Wingate test, control of training process.

P-096 The effect of sprint exercises on serum superoxide dismutase, catalase and malondialdehyde levels in soccer players

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OBJECTIVE This study was carried out on 18 soccer players who do sports activities, healthy and have not take in antioxidant supplement.

METHODS The levels of superoxide dismutase (SOD), malondialdehyde (MDA), and catalase (CAT) were established before and after the exercise and training effects on the antioxidant system were investigated.

RESULTS According to test results before the training programme. While SOD levels were at 1.74 ± 0.13 U/mL, these levels were measured as 2.50 ± 0.13 U/mL after the exercise. This increase in the SOD levels were found statistically considered as significantly ($p<0.05$). While MDA levels were at 4.8369 ± 0.99 mmol/L these levels were measured as 3.68 ± 0.77 mmol/L after the exercise. These decrease in MDA levels were not statistically considered as significant. ($p>0.05$). While CAT levels were at 0.16 ± 0.01, U/mL These levels were measured as 5.26 ± 0.47. U/mL. These decreases in MDA levels were statistically considered as significant ($p<0.05$). While The SOD levels were at 1.67 ± 0.36 U/mL before the test, these levels were measured as 0.89 ± 0.20 U/mL after the sprint test. These decreases in SOD levels were not statistically considered as significantly ($p>0.05$). While MDA levels were at 16.39 ± 2.68 mmol/L these levels were measured as 29.10 ± 2.62 mmol/L after the exercise. These increases in MDA levels were statistically considered as significantly ($p<0.05$). While CAT levels were at 2.89 ± 0.85 U/mL these levels were measured as 8.43 ± 0.08 U/mL. These increases in CAT levels were statistically considered as significant ($p<0.05$).

CONCLUSION As a result, exercise may improve the antioxidant defence system; at least, it may induce antioxidant production.

KEY WORDS Free radicals, andioxidants, soccer, sprint.

P-097 Methodic of speed endurance development by professional soccer players

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OBJECTIVE The characteristics of competitive loads in professional soccer present that speed endurance abilities are among the main factors for sucsess in the game. The high level of these abilities during the whole year is one of the most important problems in management of training process. The aim of this research was to establish a method for the development of speed endurance abilities and realize it in annual training program by professional soccer players.

METHODS The methods of the research were: literature review; modeling; experiments; HR changes and blood LA concentration measurements; control testing; conventional mathematical methods of data systematization.Subjects were 23 professional soccer field players from PFC "ZCKA" – Sofia, Bulgaria with 26 + 4 years old.

RESULTS The example of structure of weekly training program, which included interval trainings, was presented on Table 1. The example of dynamic of some of control test parameters, measured by Vame Vall test, was shown on Table 2. Total time of loads increased from 17 + 0.4 min to 18 + 0.5 min, or stabilization of maximal HR level from 196 to 198 beats per min during the test. Increasing of speed endurance abilities reflected positive over the match results of PFC "ZCKA" – Sofia in year 2006. In period from 20.08.2006 to 15.10.2006 the team played 18 games of which 15 were won.

Table 1. Structure of weekly training program.

Day / Tr.sesions	M	T	W	T	F	SA	S
I	B	S	Δ	Δ	Δ	T	*
II	T	T	B	T	B	B	match

Δ - interval training; B – break; S – strength training; T – technical training

Table 2. Dynamic of tests parameters.

Player	Parameters	Days of testing	
		03.10.2006	**10.10.2006**
A	Duration of load	17 min 30 sec	18 min 40 sec
	HR (max)	196 b/min	197 b/min
	LA	13.5 $mmoll^{-1}$	13.1 $mmoll^{-1}$
B	Duration of load	16 min 30 sec	17 min 15 sec
	HR (max)	198 b/min	198 b/min
	LA	11.8 $mmoll^{-1}$	11.1 $mmoll^{-1}$

CONCLUSION The analyses presented that content of interval training method was a chain of special soccer exercises with duration loads of 4 x 2 min. The breaks between exercises were 2 min. and between the series – 10 min, by number of series 2 to 3 in one training session.The results established tendency of significant development during the whole year

KEY WORDS professional soccer, speed endurance, methodic, training program.