7. SPORTS MEDICINE (2)

O-038 Deep vein thrombosis and the athlete: A case study

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OBJECTIVE Although trauma is one of the most common causes of lower extremity DVT, athletes may present with DVT from other non-related causes. There is a lack of scientific literature concerning the return to sport protocol following a deep vein thrombosis (DVT). A systematic literature review of football players diagnosed with a DVT is conducted for relevant primary studies on the issue of ambulation and the initiation of vigorous exercise or rehabilitation in the setting of a recently diagnosed DVT.

METHODS A case report is presented of an American flag football player who was diagnosed with a DVT. The athlete in this case report returned symptom-free to vigorous sporting activity within 3 weeks of being diagnosed of having a lower-limb DVT, this despite the DVT still being evident on the duplex doppler ultrasound evaluation. The results of the literature review did not provide adequate scientific evidence to guide practitioners regarding when to advise their athletes to restart physical activity.

RESULTS The athlete in this case report returned symptom-free to vigorous sporting activity within 3 weeks of being diagnosed of having a lower-limb DVT, this despite the DVT still being evident on the duplex doppler ultrasound evaluation.

CONCLUSION Until more evidence becomes available from randomized controlled trials and other case reports, the appropriate time for the athlete to return to sporting activity remains unknown. Incorrectly diagnosed DVT in athletes may have fatal consequences. The practitioner can greatly benefit from case reports in this subject.

KEY WORDS Deep vein thrombosis, clinical examination, athletic activity.

O-039 Preventing iron deficiency and anemia in professional and semi- professional football players

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OBJECTIVE Two distinct haematological phenomenons can occur in endurance-trained athletes: a) a rheological adaptation to endurance exercise leading to a rapid increase of plasma volume which decreases hematocrit (Ht), and haemoglobin (Hb) levels (athletes' pseudoanemia) and b) a true iron deficiency and anaemia. Most studies, in the past, had failed to differentiate these two conditions. The aim of this study was to assess two haematological conditions and suggest a potential time schedule for laboratory tests during training season in professional and semiprofessional football players to prevent true iron deficiency and anemia and avoid improper use of iron supplements.

METHODS Fifty five male football players were divided into 3 groups and had a full clinical and laboratory evaluation. Pre-tests performed prior to the beginning of the preparation period for group 1 (24.6±4.8y) and one week after the beginning of this period for groups 2 (19.6±5.7y) and 3 (19.7±1.6y). Post-tests performed at the end of the preparation period for groups 1 and 2 and after 4 weeks of training for the 3rd group. All training sessions performed by subjects were similar in number, volume, and intensity with a slight variance on strength training for adolescents.

RESULTS There was a significant decrease in Ht and Hb levels (Table 1) at the end of the preparation season only in participants of the 1st group (McNemar's p=0,002). This indicated that this observed reduction was probably the result of a plasma volume increase. No significant change was observed in Fe and ferritin levels in all 3 groups' pre and post tests. Compared to professional players, semi-professionals showed a higher prevalence of low ferritin levels.

Table 1. Mean pre and post Ht and Hb levels in groups 1, 2, 3.

Variabble	Mean Ht (pre)	Mean Ht (post)	Mean Hb (pre)	Mean Hb (post)
Group 1	47.0	44.2	15.7	14.6
Group 2	44.7	44.4	14.8	14.9
Group 3	43.8	42.8	14.6	14.3

CONCLUSION According to the results of this study athletes' pseudoanemia occurred early at the beginning of the preparation period and could mislead to unnecessary iron supplementation. Scheduling of blood tests 1 and 5 weeks after the beginning of the preparation period seemed to be more efficient to prevent or treat true iron deficiency anemia.

KEY WORDS Anemia, iron deficiency, pseudoanemia, football players.

O-040 Determination of bone mineral density and trunk muscle strength in active soccer players and veterans

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OBJECTIVE Soccer is a popular, complex strategically game of physical and mental challenges. Soccer players have to possess moderate to high aerobic and anaerobic power, have good agility and joint flexibility, and be capable of generating high torques during fast movements. Moreover, higher level of physical activity were directly associated with higher Bone Mineral Density. The main purpose of this study was to determine whether playing soccer at for a long period affected bone mineral density or not in further years.

METHODS In this cross-sectional study, there were fifty-seven participants in this study (15 active soccer players & 15 controls, 14 veteran soccer players & 13 controls). The Bone Mineral Density was measured from hip region with a dual energy X-ray absorptiometry device. Isokinetic trunk strength data were recorded with the Biodex System at the angular speed of 60°/s in semi standing position.

RESULTS Active soccer group had more BMD than other groups ($p<0.05$), but the veteran group's BMD scores was not statistically different compared to the control group ($p<0.05$). Active soccer group had greater trunk extension strength at 60º/s than the other groups. There were no significant differences for veteran soccer group and its age matched control group in terms of their trunk strength.

Table 1. Multivariate analyses of variance for soccer and control groups for trunk strength and bone mineral density.

Groups	BMD (gr/cm^2)		Trunk Ext@60%s.		Trunk Flex@60%s.	
	Md.	Sig.	Md.	Sig.	Md.	Sig.
Active Players Control Group	.17*	.003	81.76*	.005	27.6	.251
Veteran Players Control Group	.04	.872	36.60	.450	11.84	.871
Active Players Veteran Players	.22*	.000	105.97*	.000	57.22*	.002

* $p < 0.05$.

DISCUSSION Veteran group has not been active nearly for five years. The insignificant difference between their controls in terms of their BMD scores may be related to irregular exercise after their active carriers. Active soccer players' trunk extension strength results verify the positive effects of exercise on BMD bluntly. Therefore, after the active carrier, players should perform regular activity in order to keep BMD.

KEY WORDS Soccer, bone mineral density, trunk strength.

O-041 Isokinetic strength of quadriceps-hamstring muscle in soccer players playing in different leagues

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OBJECTIVE Soccer requires high muscular performance on legs. Muscle strength imbalances contribute to knee injuries. The quadriceps and hamstring muscle strength are important in running, kicking and stabilizing of knee. Isokinetic strength evaluation is common in the sports medicine. Muscle strength imbalances contribute to knee injuries. The aim of this study was to compare the concentric and eccentric isokinetic quadriceps and hamstring muscle strength among the professional soccer players according to their playing league.

METHODS 145 professional soccer players in concentric (1st league n=74, 2nd league n=51, 3rd league n=20) and 130 players in eccentric test (1st league n=59, 2nd league n=51, 3rd league n=20) participated in this study. Concentric and eccentric strength of quadriceps and hamstring in both legs was assessed using a Biodex at 60º/s (Peak torque, peak torque/body weight and hamstring quadriceps ratio).

RESULTS Concentric and eccentric muscle strength were different between the leagues. Concentric and eccentric strength values of quadriceps in both leg were higher in the 1st league than 2nd -3rd league (p<0.05). Same values of concentric hamstring in both legs in the 3rd league teams were less and eccentric hamstring and ratio values were higher in the 2nd league than the others(p<0.05).

Table 1. The values of quadriceps and hamstring concentric and eccentric peak torque (N-m), on both legs at 60 degree/second in three league teams.

			Concentric (60 degree/second)			Eccentric (60 degree/second)		
			1st league	2nd leaque	3rd league	1st league	2nd leaque	3rd league
Quad	**PT (N-m)**	Pre	257.6 (32.9)[a]	238.3 (30.2)[b]	221.9 (25.5)[b]	210.9 (38.3)[j]	190.5 (35.8)[k]	175.9 (36.2)[k]
		Non-pre	262.3 (38.3)[c]	235.5 (29.3)[d]	221.2 (24.5)[d]	207 (36.1)[l]	185.4 (39.1)[m]	178 (29.3)[m]
Ham	**PT (N-m)**	Pre	141 (21.6)[e]	132.3 (41.4)[f]	113.2 (23.4)[f]	253.7 (92.8)[n]	301 (57.4)[o]	262.5 (70.7)[n]
		Non-pre	134.9 (20.1)[g]	128.2 (44)[h]	106.9 (20)[h]	250.8 (97.2)[s]	296.7 (64.4)[r]	255.5 (54.3)[s]

Quad: Quadriceps, Ham: Hamstring, PT: Peak Torque, Pre: prefered leg, Non-pre: Non-prefered leg. a>b, c>d, e>f, g>h, j>k, l>m, o>n, r>s: Significance of difference between the three league teams p < 0.05

CONCLUSION Muscle strength imbalances contribute to knee injuries. The results showed that the muscle strength of players can be related to their playing league because soccer teams have different strength training programs. Specific eccentric exercises for quadriceps and hamstring muscle should be supported into the soccer player's training program. Therefore; knee injuries can be prevented.

KEY WORDS Soccer, league, isokinetic, concentric and eccentric muscle strength

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O-042 Effect of age on isokinetic concentric and eccentric strength of knee muscles in soccer players

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OBJECTIVE Soccer is widely considered to be the most popular sport in the world. Several injuries have shown that muscle strength is affected by several parameters such as height, body mass, dominant leg and age. The purpose of this study was to investigate the effect of age groups and the difference of dominant and non-dominant leg on concentric and eccentric isokinetic peak torque of quadriceps and hamstring muscles strength in men soccer players.

METHODS 102 (19.71± 3.8 years) soccer players participated. The players were divided in to four groups as 15-17 years (n=34), 18-20 years (n=35), 21-23 years (n=16), 24>-years (n=17). Concentric and eccentric isokinetic quadriceps and hamstring muscle strength was measured at angular velocities of 60 degree/seconds (5 repetitions).

RESULTS Our results showed the effect of age had no significant difference on concentric and eccentric peak torque values between four age groups. Dominant leg hamstring concentric peak torque values were greater than non-dominant leg peak torque values ($p<0.01$). No significant difference was found for eccentric peak torque values ($p>0.05$).

Table 1. Quadriceps and hamstring peak torque comparisons between dominant and non-dominant leg.

PT (Nm)	Concentric (60 degree/second)				Eccentric (60 degree/second)			
	Dominant X (SD)	Nondominant X (SD)	t	p	Dominant X (SD)	Nondominant X (SD)	t	p
PTE	222.7 (30.2)	224.4 (28.2)	-0.9	0.36	176.5 (34.5)	171.3 (35.7)	1.8	0.73
PTF	115.8 (19.7)	110.6 (18.8)	3.6	0.0*	273.3 (71.4)	267.9 (64.3)	1.08	0.28

PT: Peak Torque, PTE: Peak Torque Extension, PTF: Peak Torque Flexion, $p < 0.01$.

CONCLUSION The results presented that muscle strength may not be affected by age. The concentric muscle strength value of the dominant leg is expected to be higher than that of the non-dominant leg. Following studies should be carried out with increased number of age groups and number of players.

KEY WORDS Soccer, age, isokinetic, muscle strength, concentric, eccentric.

O-043 Dental health status and behaviors of young soccer players

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OBJECTIVE The high performance standards required athletes can only be attained by a totally healthy individual. Poor oral health among athletes has been related to poor performance in training and games, poor social relationships and less success in future life (Kerr, l983). The purpose of this study was to examine behaviours related with oral health as well as DMFt (Decayed, Missing, Filled Teeth) and DMFs (Decayed, Missing, Filled Surface) index of the licensed young soccer players

METHODS 208 licensed young soccer players age between 13 to 19 years old participated in this study. Athletes were examined by three expert dentists. As an indicator of oral health, DMFt and DMFs indexes were calculated. In addition, oral health questionnaire were administered to determine oral health behaviours' of the athletes.

RESULTS Findings related to dental health status indicated that 85.4 % of athletes have at least one decayed tooth (DMFt>1). Mean value of DMFt was 3.2 ± 2.5 and mean value of number of decays on tooth surface (DMFs) was 4.12 ± 3.35. 95% of athletes believed importance of regular dental care for their oral health. 21% of athletes had dentist fear and only 15.9% of them had regularly been using dental health services.

DISCUSSION There is no nationwide study about oral health of athletes. It may be assumed that this study is the very first one in this field. All of the oral exams were made by three dentists and because of acceptable examination conditions it was assumed that the collected data were reliable. Although the importance of oral health is known by the majority of athletes, this study implied that their oral health status was unsatisfactory. Only some of the participants, who reported that they have enough information about oral health, had been receiving regular oral health services.

REFERENCES
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KEY WORDS Dental health, Soccer, DMFt and DMFs index.

O-044 Physiological profiles of soccer players with respect to playing positions

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OBJECTIVE Soccer players are expected to have different physiological characteristics according to their playing positions. However, the results of the previous studies are contradicting with each other. Understanding their physiological capacities may assist coaches while preparing different training programs for goal keepers, defenders, midfielders and strikers. The aim of this study was to examine the physiological differences of soccer players with respect to their playing positions.

METHODS Ninety seven soccer players participated in the study. Physical and physiological variables including body mass index (BMI), body fat, sit & reach, velocity, heart rate and lactate measurements were recorded and compared among goal keepers, defenders, midfielders and strikers. A portable finger-stick blood lactate meter (Lactate Pro) was used for lactate measurements.

RESULTS ANOVA was conducted and significant difference was found between playing positions in terms of BMI $F_{(3, 93)}= 2.87$, $p< .05$. No significant difference was found between playing positions with respect to body fat, sit & reach, HR and velocity (3 and 4 mmol). Post-Hoc analysis was conducted and significant difference was found between goal keepers and midfielders.

Table 1. Means and standard deviations for independent variables for playing positions.

	Defender (N=27)	Midfielder (N=39)	Striker (N=20)	Goal keeper (N=11)
BMI	23.0 (1.96)	22.58 (1.5)*	22.69 (1.8)	24.25 (1.6)*
Body Fat	10.5 (5.6)	9.6 (4.5)	9.7 (2.9)	13.2 (7.2)
Sit & Reach	16.7 (6.2)	17.1 (5.6)	17.3 (6.8)	16.3 (5.7)
HR (3 mmol)	163.8 (7.8)	162.3 (12.9)	164.0 (14.0)	159.3 (11.4)
Velocity (3 mmol)	12.1 (1.8)	11.7 (2.0)	12.0 (2.2)	11.2 (1.0)
HR (4 mmol)	176.3 (8.3)	176.5 (9.8)	177.4 (10.9)	171.9 (11.4)
Velocity (4 mmol	13.8 (1.5)	13.6 (1.4)	13.5 (1.8)	12.9 (1.2)

* significant difference between midfielder and goal keeper $p < 0.05$.

CONCLUSION The results showed that goal keepers have higher BMI scores than midfielders. Non significant variables among the playing positions may be the result of competitive and collective structure of the soccer game for all players. It can be concluded that physiological and physical profiles may not be affected by playing positions.

KEY WORDS Soccer, playing position, blood lactate, BMI, body fat, flexibility.