34. FEMALES AND FOOTBALL

P-105 Sports injuries in woman soccer players

Hiroyuki Horino ✉
Waseda University, School of Sport Sciences

OBJECTIVE In recent years, several researchers have investigated sports injury in woman soccer players. They reported that the ratio of injuries at the leg joint and the knee joint was high. Moreover, compared to male footballers, it was reported that the rate of front cross ligament damage and compression fracture (stress fracture) were higher. However there is little research that investigated sports injury in woman football players continuously. The purpose of this study is to clarify the characteristic of sports injury about woman soccer players. In addition, prevention of their sports injury was discussed from a viewpoint of their knowledge about the First aid.

METHODS 365 university woman soccer players(20.2±1.25 years) participated in this study. In the questionnaire, injured experiences including the injured situation were investigated throughout their career. They reported about all the sports injury which interruptted their training in the past. Their knowledge about of first aid was also investigated.

RESULTS Percentage of the injury on leg joint and knee joint was notably high. Injuries at the moment of non-contact were higher than contact moment's. The injury rate increased until after age 18 remarkably. Half of the players recognized first aid method after 18 years. Although recognition of "Rest" and "Ice" were high level, "Compression" and "Elevation" have not fully been recognized and executed.

Table 1. The injured region and age.

Region	AGE					
	-12	13-15	16-18	19-24	total	(%)
head, Face, Neck	1	3	7	8	19	(2.9)
arm・forearm	0	1	1	3	5	(0.8)
shoulder, clavicle	1	1	2	5	9	(1.4)
elbow	0	1	1	3	5	(0.8)
hand	4	0	9	19	32	(4.9)
trunk	0	8	9	21	38	(5.8)
hip	0	0	1	6	7	(1.1)
thigh	0	4	18	37	59	(9.0)
knee	4	3	37	69	113	(17.3)
leg	1	5	16	15	37	(5.6)
ankle	3	17	104	187	311	(47.5)
foot	1	2	6	11	20	(3.1)
total	15	45	211	384	655	
(%)	(2.3)	(6.9)	(32.2)	(43.5)		(100.0)

CONCLUSION The results indicated that most of the injuries occurred on the lower extremity and took place at the moment of non-contact in woman soccer. It became clear that sports injury increased in high school, when performance level and training load increased. However, the results indicated that the university woman players were not fully recognized the knowledge of first aid method.

KEY WORDS Women soccer, sports injury, first aid.

P-106 Countermovement jumping genre differences in soccer

Italo Sannicandro, Dario Colella, Rosa Anna Rosa and Milena Morano
University of Foggia, Italy

OBJECTIVE Investigation into the different movements involved in jumping appears to be directly linked to previous injuries of the anterior cruciate ligament (ACL) in female sports. Nowadays female team sports follow the same evolution as male ones and are practiced at increasing executive speeds and competitive levels (Pettineo, 2004). Using tests

from some biomechanical parameters this work verified if there were both quantitative and qualitative differences in the movements involved in jumping in male soccer players (n=12, age 24,7±5,9, weight 74,2±6,7 kg., height 180±7 cm) and female soccer players (n=12, age 23,2±4,7 , weight 60±7,2kg., height 170±5 cm),so as to find potential injury risks.

METHODS To evaluate different movements involved in jumping two separate force spring-boards were used (Twin Plates- Tesys Globus Italia) each with its own software containing tests related to their different biomechanical parameters. The software connected to the two disjointed spring-boards provided the quantitative data which referred to temporal parameters of different movements involved in Counter Movement Jump (CMJ).

RESULTS According to the results lifting the cog distinctly gave the female and male groups the values of 20,33±2,15 cm and 31,83±3,35 cm ($p<.01$).Regarding strength values expressed during coupling time, statistically significant differences were found in the comparison between female and male (left $p<.05$right.01)

DISCUSSION & CONCLUSION The reduced length of the overstretching phase in females explained the strategies which were carried out by subjects with less strength values to use the miotattic reflex in order to improve jumping performance. Female soccer players' protective attitude was further confirmed by the strength peak during coupling time that was another very important parameter regarding the effectiveness of CMJ.

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KEY WORDS CMJ, neuromuscular differences, overstretching phase, female soccer.

P-107 Sleep, pre-game fatigue, and game performance in female college soccer players

Vanessa Martinez and Edward Coyle
University Of Texas at Austin, USA

OBJECTIVE Soccer is a demanding sport that requires both mental and physical readiness for optimal performance. Sleep and perceived levels of mental and physical fatigue before a game may be related to game performance. Soccer coaches and trainers can easily collect these data before games to monitor the mental and physical state of players and subsequently take action to minimize players' pre-game fatigue (Figure 1). The purpose of this study was to investigate the relationships between sleep duration (SD) the night before a match, pre-game perceived levels of head alertness (HA) and leg quickness (LQ), game outcome (GO) and 6 game performance variables (GPV) among female college soccer players.

METHODS The participants were 21 female college soccer players (age 20.3 ± 1.4 yrs; height 1.69 m ± 4.32 cm; weight 64.32 ± 6.18 kg). SD and pre-game perceived levels of HA (mental fatigue; scale of 1-very dull to 5-very sharp) and LQ (physical fatigue; scale of 1-very slow to 5-very quick) were collected before 21 season games. The GO and the 6 GPV were also collected for each game. A Pearson correlation analysis was used to investigate the relationships between these variables.

RESULTS Descriptive statistics of the variables were: SD (8.99 ± 0.62 hrs); HA (3.98 ± 0.22); LQ (3.79 ± 0.25); and GO (14-5-2). The Pearson correlation analysis revealed a significant positive relationship between SD and HA; significant negative relationships between SD and GO, and SD and GPV; and no correlation between SD and LQ. HA was positively related to LQ but negatively related to GO and GPV. No significant association was found between LQ and GO, and LQ and GPV (Table 1).

DISCUSSION & CONCLUSION More SD the night before a game was related to higher levels of pre-game HA (less mental fatigue). Higher HA also resulted in higher LQ ratings (less physical fatigue). These findings agreed with previous studies that show that sleep deprivation impairs cognitive performance (Reilly, 2003; Walters, 2002) and post-exercise recovery (Reilly and Ekblom, 2005). Thus, we encourage players to sleep about 8-10 hrs before competition.

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Table 1. Pearson correlation results.

Variable	r	Sig
SLEEP DURATION		
Head Alertness	0.488*	0.025
Game Outcome	-0.508*	0.019
Game Performance Variables		
Goals Difference	-0.576**	0.006
Assists Difference	-0.605**	0.004
Points Difference	-0.599**	0.004
Shots Difference	-0.500*	0.021
Shots on Goal Difference	-0.506*	0.019
Corners Difference	-0.543*	0.011
HEAD ALERTNESS		
Leg Quickness	0.787**	0.000
Game Outcome	-0.457*	0.037
Game Performance Variables		
Goals Difference	-0.464*	0.034
Assists Difference	-0.466*	0.033
Points Difference	-0.475*	0.030
Shots on Goal Difference	-0.434*	0.049
Corners Difference	-0.504*	0.020

*. Correlation significant at the 0.05 level (2-tailed)**. Correlation significant at the 0.01 level (2-tailed). N = 21 games.

Collection of player's sleep duration and perceived levels of head-alertness and leg quickness before a game.

KEY WORDS Sleep, pre-game fatigue, head alertness, leg quickness, game performance, female college soccer.

P-108 Game characteristics of Asian Women's Rugby

Jun Kuroiwa[4], Iwao Kameyama[1], Masahiro Kurosu[1], Takeshi Itoh[1], Mutsuo Yamada[2], Kayoko Komatsu[1], Tetsuya Tsubakihara[3], Ichiro Watanabe[4] and Yuichi Ueno[4]

[1]Ryutsu Keizai University, [2]Saitama Medical University, [3]Musashi Institute of Technology, [4]Japan Rugby Football Union, Japan

OBJECTIVE The development of Women's Rugby contributes not only directly but also indirectly to the development of Rugby itself as a global sport. Recently Women's Rugby in Japan has broadly developed and the national team has taken part in the Women's Rugby World Cup from the 1st game in 1991 to the 4th game consecutively. The purpose of this study was to clarify the game characteristics of Asian Women's Rugby in comparison to the World level Women's Rugby as well as the World level Men's Rugby.

METHODS The games of the top 4 teams of Asian qualified games for 2006 Women's Rugby World Cup held in Thailand and the games of the top 4 teams of 2006 Women's Rugby World Cup held in Canada were analyzed. Based upon the 2003 IRB game report, the numbers of try, penalty goal, line-out, scrum, in-play time, maul/ruck, pass, kicking were adopted as the parameters for the game assessment.

RESULTS Compared to the 2003 IRB WRC game report, the ball possessions at line-out time and scrum time, in-play time, the number of maul/ ruck in Asian Women's Rugby were significantly lower than those parameters obtained in Men's Rugby. The numbers of penalty goals and kicking were obtained lower than Men's Rugby as a result.

DISCUSSION & CONCLUSION Though the superiority of physical fitness in men is obvious, the skill levels of Men also were superior to those of Women. The reason for the lower levels of ball possession and ball continuity with the lack of each individual and unit skill was identified. However, further investigating of these results is required to arrive at a more precise conclusion.

KEY WORDS Women's Rugby, game analysis.

P-109 Effects of pre-cooling and warm-up intensity on soccer-specific intermittent exercise performance in heat

Naomi Datson, Barry Drust, Greg Atkinson and Warren Gregson
Research Institute for Sport and Exercise Sciences, Liverpool John Moores University.

OBJECTIVE International soccer tournaments are frequently held in the heat (35-40°C). Therefore moderating factors that impact on thermal strain have important implications for performance. Warm-up and pre-cooling strategies influence exercise performance. Though their impact on prolonged intermittent exercise performance in the heat have yet to be fully investigated. The aim was to examine the effects of a reduction in warm-up intensity and upper body pre-cooling on repeated sprint performance during a 90 min soccer-specific intermittent exercise protocol (SSIEP) in the heat (35ºC, RH 50%, air velocity 1.2-1.4 m/s).

METHODS Six international female soccer players completed a 90-min SSIEP on a non-motorised treadmill following three different warm-up strategies; 1.Simulated match warm-up equating to 80% of maximum heart rate (HRmax)(HIW) 2.Low intensity warm-up (60% HRmax)(LIW) and 3.HIW with pre-cooling (COOL). Performance was determined from mean power output during each 3.3.s sprint (Coefficient of variation 5.8%).

RESULTS Rectal temperature was lower after LIW compared to HIW ($p=0.034$). Thermal comfort (TC) and rating of perceived exertion were lower following LIW and COOL compared to HIW ($p<0.05$). Mean sprint performance during the SSIEP was higher in LIW (573+11 W) and COOL (569+13 W) compared to HIW (548+11 W)($p=0.001$). Mean skin temperature and TC were lower during the SSIEP in COOL compared to HIW ($p<0.05$).

DISCUSSION & CONCLUSION Repeated sprint performance is improved throughout the duration of a 90-min SSIEP in the heat when the intensity of warm-up is reduced or a cooling vest is worn throughout the warm-up period. The structure of the pre-event preparation strategy should therefore be considered when competing under high environmental temperatures.

KEY WORDS Warm-up, pre-cooling, intermittent, non-motorised treadmill.

P-110 Physical status of elite female soccer players

Dawn Scott
The Football Association

OBJECTIVE The rapid growth of female soccer requires the determination of the physical status and capabilities of female soccer players. Few studies to date have examined the physical and physiological profile of female soccer players (Stolen et al, 2005). Previous studies (Bellew and Gehrig, 2006; Soderman et al, 2000) have investigated the bone mineral density (BMD) status of female soccer players, however, none in an elite cohort, and matches this with the group physical status. The aim of the present study was to provide a physical profile of elite female soccer players.

METHODS Fourteen international female soccer players (age 23.2±3.0 years; mass 64.8±3.7kg) completed a series of physical assessments. Players were assessed for height, body mass, whole body BMD and body fat percentage (using a Dual-Energy X-ray Absorptiometry (DEXA) scanner), aerobic endurance performance (via 20m multi-stage shuttle run), 10m and 20m sprint times, and vertical jump.

RESULTS Mean height and body composition values were 165.4±4.2cm and 20.1±1.9% fat, respectively. Mean predicted maximal oxygen uptake (VO2max) was 53.4±3.8ml.kg-1.min-1. The mean times in the 10m and 20m sprints were 1.83±0.08s and 3.18±0.13s, respectively. The mean vertical jump height was 37.7±3.9cm. All players had higher total body BMD values than reference values for age-matched females.

DISCUSSION & CONCLUSION Physical activity, particularly high impact, was associated with greater bone density, which was apparent in this cohort. One player was only slightly higher, which suggested that the beneficial effects of training and match-play was may be negated by some athletic women. Monitoring of menstrual status and nutritional intakes in relation to BMD was warranted for future studies.

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KEY WORDS Physical status, bone mineral density, elite female soccer players.

P-111 Iron status in elite female soccer players

Dawn Scott, Pippa Bennett and Alan Hodson
Mecical and Exercise Science Department, the Football Association, Lilleshall Hall National Sports Centre, Nr Newport, Shropshire, TF10 9AT .

OBJECTIVE FIFA estimates that in the year 2010, there will be more women playing football than men (Davies, 2005). Despite growing interest, few studies have examined the iron status of elite female soccer players. The impact of iron deficiency anaemia on performance is well documented. However, it is also recognised that iron deficiency without anaemia may also have adverse effects on performance (Brownlie et al, 2004). The aim of the present study was to determine the prevalence of iron deficiency and iron deficiency anaemia in elite female soccer players.

METHODS Thirty-six international female soccer players (age 21.1±3.3 years) had venous pre-prandial blood samples collected. Samples were collected in an international training camp prior to the start of the competitive playing season. Samples were analysed within 24 hours for haemoglobin concentration and ferritin stores.

RESULTS The average haemoglobin and ferritin values were 127.0±8.0g/l and 39±19µg/L, respectively. Of the female soccer players assessed, 42% had iron deficiency and 14% iron deficiency anaemia, as diagnosed by the team doctor.

DISCUSSION & CONCLUSION The prevalence of iron deficiency and iron deficiency anaemia in the current study was lower than in studies of elite female soccer players (Landahl et al, 2005), and higher than values for general female population . This suggested that elite sport places extra demands on females to maintain adequate iron stores. Regular monitoring of haemoglobin and iron status should be employed.

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KEY WORDS Iron deficiency, anaemia, elite female soccer players.