Latest research in football 2013

#1 Bioimpedance and Impedance Vector Patterns as Predictors of Male Elite Soccer Players

Authors: Micheli ML, Pagani L, Marella M, Gulisano M, Piccoli A, Angelini F, Burtscher M, Gatterer H.

Summary: Bioelectrical impedance standards (resistance, reactance and phase-angle) are well established for the normal population or within the clinical setting and are considered indicators for cell mass, cell function and hydration status. However, such standards do not exist for the male soccer population. Therefore, the goal of the present investigation was to provide a set of bioelectrical impedance data of a large sample of soccer players with different performance levels. 893 players, registered within all Italian soccer divisions, were divided into 5 groups according to their performance level. Whole-body impedance measurements were performed during the first half of the competitive period. Besides estimation of body composition, the bioelectrical impedance vector analysis (BIVA) was performed. BIVA does not depend on equations and displays differences in hydration and body-cell mass (BCM). Individual vectors can be classified by using the 50%, 75% and 95% tolerance ellipse. Results: In comparison to the other divisions and to the normal population, the mean vector of the elite-level showed a shift to the left (p<0.001). When compared to the elite-level, players of a lower performance level had lower phase-angles, BCMs and fat-free masses. Conclusions: In conclusion, soccer players belong to a specific population. Muscle mass and function, as indicated by BCM and phase-angle, increase with increasing performance level. The soccer specific tolerance ellipses might be used for classifying individual vectors and to define target regions for low level players

#2 A Comparison of Physical Abilities and Match Performance Characteristics Among Elite and Sub-Elite Under-14 Soccer Players

Authors: Waldron M, Murphy A.

Summary: This study aimed to identify characteristics of match performance and physical ability that discriminate between elite and sub-elite under-14 soccer players. Players were assessed for closed performance and movement, physiological responses and technical actions

during matches. Elite players covered more total m·min-1 (115.7 ± 6.6 cf. 105.4 ± 7.7 m·min-1) and high intensity m·min-1 (elite = 14.5 ± 2.3 cf. 11.5 ± 3.7 m·min-1) compared to sub-elite players. Elite players also attempted more successful (0.41 ± 0.11 cf. 0.18 ± 0.02) and unsuccessful ball retentions·min-1 (0.14 ± 0.04 cf. 0.06 ± 0.02) compared to sub-elite players. Elite players were faster over 10 m (1.9 ± 0.1 cf. 2.3 ± 0.2 s) and faster dribblers (16.4 ± 1.4 cf. 18.2 ± 1.1 s) compared to sub-elite players. Speed (10 m) and successful ball retention·min-1 contributed to a predictive model, explaining 96.8% of the between-group variance. The analysis of match performance provides a more thorough understanding of the factors underlying talent among youth soccer players

#3 Motion Characteristics of Youth Women Soccer Matches: Female Athletes in Motion (FAiM) Study

Author: Vescovi JD.

Reference: Int J Sports Med. 2013 Jul 18. [Epub ahead of print]

Summary: This study determined the locomotor characteristics for youth female soccer matches. 89 female soccer players (U-15-U-17) were assessed during a youth national championship or a talent identification camp using a Global Positioning System. Positional and age-group comparisons of locomotor characteristics were made for complete games, each half, differences between halves as well as sprint profiles using an ANCOVA adjusting for the differences in game or half durations, respectively. Midfielders covered greater distances (8 449±170 m) than defenders (7 779±114 m), mostly from more low- (2 553±99 m vs. 2 151±66 m) and moderate-speed running (1 389±78 m vs. 1 142±52 m). Forwards had more sprint distances (275±42 m), sprints (15±2) and greater maximum speed (26.7±0.6 km · h-1) than midfielders (131±24 m, 8±1, 24.7±0.4 km · h-1, respectively). There was a tendency for increased distances within most velocity bands, workrate and sprints with increasing age. There was a greater increase in walking and jogging between the first and second half for forwards than defenders and midfielders. Youth female soccer players covered 6 500-9 000 m during matches with positional distinctions that are comparable to elite-standard women. These data provide novel insight into the physical demands of female youth soccer and should be used to establish appropriate age-group and positional strategies for training and development

#4 Delivering men's health interventions in English Premier League football clubs: key

design characteristics

Authors: Pringle A, Zwolinsky S, McKenna J, Daly-Smith A, Robertson S, White A.

Reference: Public Health. 2013 Jul 17. pii: S0033-3506(13)00126-1. doi: 10.1016/j.puhe.2013.04.011. [Epub ahead of print]

Summary: The purpose was to investigate the key design characteristics of Premier League Health (PLH), a national programme of men's health improvement delivered in/by 16 English Premier League (EPL). Health Trainers (HTs) were hired by EPL clubs to deliver PLH. HTs were the focus of investigations aimed at identifying the active design characteristics of male-specific health promotion interventions. Semi-structured interviews led by researchers were performed with 13/16 HTs and identified the key design characteristics influential in (I) reaching and (II) helping participants adopt health improvement interventions delivered in professional football club settings. HTs believed that combining the appeal of football alongside EPL clubs, offered a unique opportunity to reach adult males, including hard-to-engage-men (HTEM). Awareness raising events held on match days aimed to connect with men, but outreach activities were especially important for engaging participants. Following initial reach, familiar settings, such as the club stadia and community venues were also important for ensuring regular involvement in health improvement sessions. Interventions shaped around men's health needs and delivered at times when participants could more easily attend, were factors which helped to engage men. Supportive social environments and a range of exercise modes and delivery options were also seen by HTs as being similarly important. Both the informality and familiarity of EPL clubs were viewed by HTs as having substantial advantages over conventional NHS settings for reaching and engaging men. Importantly, HTs contributed substantial skills to the delivery of PLH. Although, top flight professional football clubs can recruit men, including those regarded as hard-to-engage into health improvement programmes, considerable attention to delivery refinement is needed to support male participants adopting interventions aimed at promoting healthy lifestyles.

#5 Analysis of Sprinting Activities of Professional Soccer Players

Authors: Andrzejewski M, Chmura J, Pluta B, Strzelczyk R, Kasprzak, A

Reference: J Strength Cond Res 27(8): 2134–2140, 2013

Summary: The aim of the study was a detailed analysis of the sprinting activity of professional soccer players. The study involved 147 players who played in 10 matches of the 2008–09 and 2010–11 UEFA Europa League seasons. The number of performed sprints and total sprint

distances covered by the players were examined using collected statistical material. Two types of sprints were distinguished based on their duration: S, short-duration sprint (below 5 seconds) and L, long-duration sprint (above 5 seconds). Additionally, sprints were classified according to their distance: 0–10, 10.1–20.0, and >20 m, respectively. The analysis of the sprinting activity of soccer players also involved their respective positions of play. The study was carried out using Amisco Pro (version. 1.0.2), one of the most comprehensive up-to-date computer systems for match analysis. The statistical analysis revealed that the mean total sprint distance covered by players (≥ 24 km·h-1) amounted to 237 ± 123 m. With regard to the position of play, the forwards covered the longest sprint distance (345 ± 129 m), that is, 9% longer than midfielders (313 ± 119 m) and over 100% longer than central midfielders (167 ± 87 m). The average number of sprints performed by the soccer players was 11.2 ± 5.3. It should also be emphasized that about 90% of sprints performed by professional soccer players were shorter than 5 seconds, whereas only 10% were longer than 5 seconds. Analysis of physical loads of soccer players during matches can be useful for individualization of training of soccer players' speed capabilities. It is an essential instrument of modern planning and application of training loads.

#6 Evaluation of a Specific Reaction and Action Speed Test for the Soccer Goalkeeper

Authors: Knoop M, Fernandez-Fernandez J, Ferrauti A

Reference: J Strength Cond Res 27(8): 2141–2148, 2013

Summary: The aim of this study was to develop and evaluate a new test for the soccer goalkeeper that involved perceptual and movement response components (i.e., sprint running, jumping, diving, and direction changing). The evaluation consisted of measurements in different age (U19 [18.0 ± 0.9 years], n = 21; U14 [14.1 ± 0.3 years], n = 13) and performance (i.e., first goalkeepers and substitutes) groups of goalkeepers, including measures of test-retest reliability. Validity was assessed comparing the 2 groups of goalkeepers with different expertise levels (i.e., competitive level and age group). The test-retest correlations of the reaction and action speed (RAS) test performance were significant in all single (intraclass correlation coefficient [ICC] = 0.68–0.95; $p < 0.01$) and complex measurements (ICC = 0.91; $p < 0.01$). The RAS single test performance was higher in older (U19) compared with in younger (U14) players ($p < 0.001$), and they also showed better results in the RAS complex tests ($p = 0.000$), being significantly different between the first goalkeepers and their substitutes ($p = 0.001$). Moreover, for all age groups (i.e., U14, U19), defensive actions to the bottom corners were faster than

those to the top corners, with large ES (i.e., > 1). The major findings of the study were that the RAS test provided a reliable and valid method of assessing specific defensive agility in a group of youth soccer goalkeepers. Performance responses during the RAS test allow coaches to discriminate between age-matched goalkeepers, identify weaknesses (e.g., nonpreferred side dive performance), and to design specific training tasks.

#7 The Effect of High vs. Low Carbohydrate Diets on Distances Covered in Soccer

Authors: Souglis AG, Chryssanthopoulos C, Travlos AK, Zorzou AE, Gissis IT, Papadopoulos CN, Sotiropoulos AA

Reference: J Strength Cond Res 27(8): 2235–2247, 2013

Summary: The purpose of this study was to compare the distances covered during a 11-a-side soccer match after players had consumed either a high carbohydrate (CHO) or a low CHO diet. Twenty-two male professional soccer players formed 2 teams (A and B), of similar age, body characteristics, and training experience. The 2 teams played against each other twice with a week interval between. For 3.5 days before the first match, the players of team A followed a high CHO diet that provided 8 g CHO per kg body mass (BM) (HC), whereas team B players followed a low CHO diet that provided 3 g CHO per kg BM (LC) for the same time period. Before the second match the dietary treatment was reversed and followed for the same time period. Training during the study was controlled, and distances covered were measured using global positioning system technology. Every player covered a greater total distance in HC compared with the distance covered in LC (HC: 9,380 ± 98 m vs. LC: 8,077 ± 109 m; $p < 0.01$). All distances covered from easy jogging (7.15 km·h−1) to sprinting (24.15 km·h−1) were also higher in HC compared with LC ($p < 0.01$). When players followed the HC treatment, they won the match (team A vs. team B: 3-1 for the first game and 1-2 for the second game). The HC diet probably helped players to cover a greater distance compared with LC. Soccer players should avoid eating a low (3 g CHO per kg BM) CHO diet 3–4 days before an important soccer match and have a high CHO intake that provides at least 8 g CHO per kg BM

#8 Factors Influencing the Implementation of Anterior Cruciate Ligament Injury Prevention Strategies by Girls Soccer Coaches

Authors: Joy, EA, Taylor, JR, Novak, MA, Chen, M, Fink, BP, Porucznik, CA

Reference: J Strength Cond Res 27(8): 2263–2269, 2013

Summary: Women are 3 times more likely to injure their anterior cruciate ligament (ACL) while playing soccer than men. ACL injury prevention programs (IPPs) involving stretching and strengthening drills can reduce the incidence of ACL injury when incorporated into routine training. The rate of implementation among coaches is largely unknown. The purpose of this study was to determine the rate of implementation of ACL IPP, to identify factors that influence implementation, and to acquire information to assist in design dissemination and implementation strategies. Study subjects were coaches of woman soccer players aged 11–22 years in Utah (n = 756). Data were gathered using a Web-based survey followed by a qualitative study in which "best practice coaches"—coaches who met criteria for successful implementation of ACL IPP—were interviewed via telephone. A minority of survey respondents, 19.8% (27/136), have implemented ACL IPP. Factors associated with successful implementation include length of coaching experience and presence of additional support staff such as a strength and conditioning coach or athletic trainer. Best practice coaches (14/136) unanimously agreed on the following: (a) there are performance-enhancing benefits of ACL IPP, (b) education on ACL injury prevention should be required for licensure, and (c) dissemination and implementation will require soccer associations to enact policies that require IPPs. In conclusion, a minority of girls soccer coaches have implemented ACL IPP and those that have do so because they believe that prevention improves performance and that soccer organizations should enact policies requiring ACL injury prevention education and implementation. Efforts to implement ACL IPP should be driven by soccer organizations, emphasize performance-enhancing benefits, and engage additional coaching staff.