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Brazilian Footvolley: A Displacement Screening Study of a Professional National Match

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Abstract The footvolley practice has been growing around the world. However, there is no displacement and neuromuscular information in response to a match for helping coaches on training prescription. Current study aimed to screen distance and fatigue-induced parameters of a professional Brazilian footvolley match. Three professional athletes participated of the present study. GPS data was collected during all a single match and 10-meter acceleration information was collected pre- and post-match. The athletes presented 5.96% of velocity decreases in response to a match and displaced an average distance of 633 meters and the average intensity was 39.4% of the maximal acceleration capacity. Taking into account the association between total distance, fatigue index, and intensity, we could speculate that, although the reduced distance and intensity, the fatigue index was relevant in the match. The current study brings important practical suggestions regarding an official and leisure modality.

Keywords Footvolley, Fatigue, Sand training, GPS

1. Introduction

It is well known that professional soccer includes lower limb power and proper strength and conditioning demands (Barnes, Archer, Hogg, Bush, & Bradley, 2014). Diverse global training methods with the ball have been applied for developing the above mentioned variables. In Brazil, an interesting sport modality called “footvolley” is largely practiced by soccer athletes as a leisure moment (Figure 1). However, this specific modality has been growing in the last 10 years and became an official regional sport with relevant competitions in Brazil. The “footvolley” is applied in a sand environment with volleyball net in an area of 18x9 meters (Figure 2). The rules are the same of volleyball (i.e., 3 touches, point is gained when the ball touches the ground), the difference is that only two participants play for each side and the ball cannot touch hands.

Regarding footvolley environment and prescription research, the literature has been focused on physical training (i.e., sand jumps, sprints, and short displacements) with general implications for different sports modalities (Gaudino et al., 2013; Impellizzeri et al., 2008). However, there is no specific investigation concerning footvolley practice and its singular physical demands.

Although this modality is well known in Brazil, there is a lack of data (i.e., no study of our knowledge) in relation to displacement parameters and neuromuscular fatigue in response to a professional match. In fact, the coaches who try to develop footvolley athletes performance have been working with no representative data to help training prescription. Thus, important practical questions emerge: which is the total travelled distance in a match? Which is the maximal velocity in a match? Which is the average velocity in a match? What is the intensity compared to atheltes’ maximal velocity? Does acceleration capacity decrease in a match? In this context, the present study aimed to screen and describe these singular displacement and neuromuscular parameters in response to an official match in the professional Brazilian championship.

Figure 1. Brazilian soccer players (Daniel Alves and Neymar Junior) playing footvolley – by Gaspar Nóbrega

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Figure 2. Footvolley environment and training (Villeroy Team) – by Vicente Vaccaro

2. Methods

Participants

The sample was three professional footvolley players from Villeroy Team (33 ± 5 years old; 79 ± 6 kg; 179 ± 4 cm), who were asked to voluntarily participate of the assessments in the official match day. After recruitment and acceptance, individuals received a consent form to read and sign if they agreed. This study was performed in accordance with the Helsinki Declaration. The inclusion criteria were (a) men between 18 and 40 years (b) without neuromuscular, cardiovascular, pulmonary, or metabolic diseases, (c) no use of any type of substances that could improve the neuromuscular performance, and (d) with no training interruptions during the past year. The participants played the same match (Athlete 1 and 2 vs. Athlete 3 and other who did not participate).

Acceleration capacity and GPS parameters

Before and immediately after the match, participants executed three 10-meter sprint bouts with 30 seconds of rest between each attempt for measuring maximal acceleration capacity utilizing photocells (Speed Test 6.0 Std, São Paulo, Brazil). They warmed up during 5 minutes of skeeping and submaximal sprints. All athletes were familiarized with the test. The maximal sprint bouts were conducted in the same environment condition of the match (i.e., sand). Maximal (all-out) effort was required for each participant, being verbal encouragement implemented during all repetitions. Furthermore, the athletes used a specific trunk vest for coupling the GPS (QStartz 5Hz, BT-Q1300ST, Taiwan) during all match's time (i.e., 20 minutes).

3. Results

Because of the descriptive study's purpose and reduced sample, we did not use statistical analyze. Moreover, the current data are specific for practical implications and only suggestive for training considerations. All data are showed with mean and standard deviation (SD). Table 1 presents individual physical characteristics. Table 2 presents pre- to post-match 10-meter sprint performance and fatigue index. Table 3 presents GPS parameters. Table 4 presents match's intensity data.

Table 1. Physical characteristics

Athlete	Age (years)	Body mass (kg)	Height (cm)
1	29	76	178
2	39	75	176
3	31	85	184
Mean	33	79	179
SD	5	6	4

Table 2. 10-meter sprint bouts (Sand)

Athlete	Pre-match		Post-match		Fatigue index (%)
	Best sprint time	Maximal velocity (km/h)	Best sprint time	Maximal velocity (km/h)	
1	1.69	21.30	1.93	18.65	12.44
2	1.86	19.35	1.94	18.56	4.08
3	2.13	16.90	2.16	16.67	1.36
Mean	1.89	19.19	2.01	17.96	5.96
SD	0.22	2.21	0.13	1.12	5.77

Table 3. GPS parameters

Match's time	Velocity avegare (km/h)	Maximal velocity (km/h)	Traveled distance (m)
20min	5.05	6.70	500
20min	4.06	8.06	600
20min	5.14	7.63	800
Mean	4.75	7.46	633.33
SD	0.60	0.70	152.75

Table 4. Match's intensity

Athlete	Maximal velocity capacity (km/h)	Maximal velocity playing (km/h)	% of maximal on match
1	21.30	6.70	31.45
2	19.35	8.06	41.65
3	16.90	7.63	45.14
Mean	19.19	7.46	39.41
SD	2.21	0.70	7.11

4. Discussion and Conclusions

The current investigation proposed to identify displacement characteristics of a premature and great sport modality in Brazil in which coaches have no representative neuromuscular data to help training prescription. Despite our reduced sample, the present study aimed to only offer practical and experienced information of a growing sport. One of our main results was the fatigue index information because athletes showed 5.96% of acute velocity decreases in response to a match of 20 minutes (Figure 3). In comparison to soccer, this is an interesting fatigue index value, once elite soccer players may show an acute sprint

performance decrease of 2.6% after playing 45 minutes (Edholm, Krustrup, & Randers, 2014). Furthermore, maximal knee extension torque seems to decrease approximately 8% after 90 minutes in professional soccer matches (Nédélec et al., 2012). Of course, present study did not evaluate maximal single-joint moment and the fatigue indexes can be completely different between maximal knee extension torque, jumps, and sprint performance (Sánchez-Medina & González-Badillo, 2011; Haugen, Tønnessen, Hisdal, & Seiler, 2014; Morin, Samozino, Edouard, & Tomazin, 2011; Pinto, Blazevich, Andersen, Mil-Homens, & Pinto, 2017).

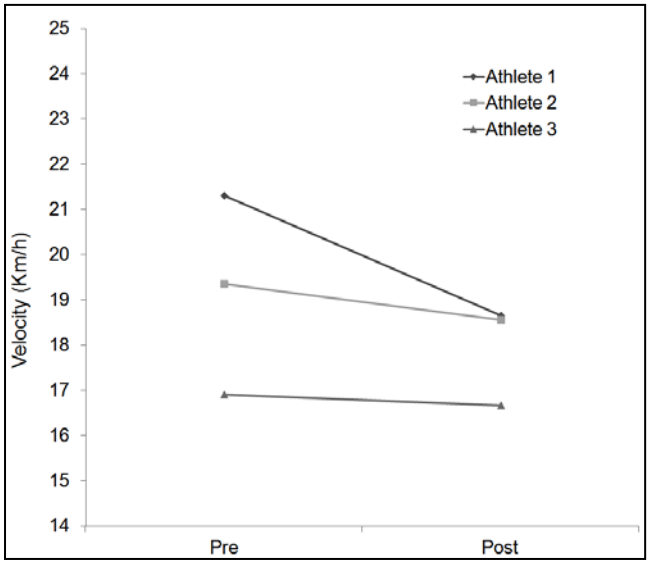

Figure 3. Individual sprint performance decreases

Besides that, other important match's information were traveled distance and the prevalent playing intensity. The athletes displaced an average distance of 633 meters and the average intensity was 39.4% of the maximal acceleration capacity. Taking into account the association between total distance, fatigue index, and intensity, we could conclude that, although the reduced distance and intensity, the fatigue index was relevant in the match. An assumption about this observed relationship could be in relation to the environment condition (i.e., sand). In this context, Gaudino et al. (2013) showed that on sand it is possible to perform maximal intensity sprints with higher energy expenditure and metabolic power values, without reaching maximum speed and with smaller impact shocks. Furthermore, exercises with change of direction carried out on this surface allow to reach higher deceleration values. In addition, sprinting on sand potentially entails a limited stretch of the involved muscles. It can therefore offer a valid alternative to traditional training, injury prevention and rehabilitation programs. In this way, it is possible to conclude that, although reduced intensity, on sand actions need greater effort than in traditional surface, possibly promoting interesting neuromuscular adaptations. Furthermore, although we did not asses jump performance and quantity in match, footvolley demands many jumps. In this sense, Impellizzeri et al. (2008) demonstrated that on sand plyometric training improved both jumping and sprinting ability and induced less muscle soreness than on grass training. Moreover, sand surface showed greater improvement in Squat Jump than grass surface.

The present study has some limitations. We did not evaluate a specific sport action as jump performance and fatigue, prevalent in match and the most appropriate practical neuromuscular fatigue indicator (Jimenez-Reyes et al., 2016). Moreover, we had a reduced sample. In summary, the current study brings important practical suggestions regarding an official and leisure modality.

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REFERENCES

[1] Barnes C, Archer DT, Hogg B, Bush M, Bradley PS. The evolution of physical and technical performance parameters in the English Premier League. *Int J Sports Med*. 35: 1095–1100, 2014.

[2] Edholm P, Krustrup P, Randers MB. Half-time re-warm up increases performance capacity in male elite soccer players. *Scand J Med Sci Sports*. Apr 30. doi: 10.1111/sms.12236, 2014. [Epub ahead of print]

[3] Nédélec M, McCall A, Carling C, Legall F, Berthoin S, Dupont G. Recovery in soccer: part I - post-match fatigue and time course of recovery. *Sports Med*. 42: 997-1015, 2012.

[4] Sánchez-Medina L, González-Badillo JJ. Velocity loss as an indicator of neuromuscular fatigue during resistance training. *Med Sci Sports Exerc*. 43:1725-34, 2011.

[5] Haugen T, Tønnessen E, Hisdal J, Seiler S. The role and development of sprinting speed in soccer. *Int J Sports Physiol Perform*. 9: 432-41, 2014.

[6] Morin JB, Samozino P, Edouard P, Tomazin K. Effect of fatigue on force production and force application technique during repeated sprints. *J Biomech*. 44:2719-23, 2011.

[7] Pinto MD, Blazevich AJ, Andersen LL, Mil-Homens P, Pinto RS. Hamstring-to-quadriceps fatigue ratio offers new and different muscle function information than the conventional non-fatigued ratio. *Scand J Med Sci Sports*. Apr 4. doi: 10.1111/sms.12891, 2017 [Epub ahead of print].

[8] Gaudino P, Gaudino C, Alberti G, Minetti AE. Biomechanics and predicted energetics of sprinting on sand: hints for soccer training. *J Sci Med Sport*. 16:271-5, 2013.

[9] Impellizzeri FM, Rampinini E, Castagna C, Martino F, Fiorini S, Wisloff U. Effect of plyometric training on sand versus grass on muscle soreness and jumping and sprinting ability in soccer players. *Br J Sports Med*. 42:42-6, 2008.

[10] Carling C, Bloomfield J, Nelsen L, Reilly T. The role of motion analysis in elite soccer: contemporary performance measurement techniques and work rate data. *Sports Med*. 38:839–862, 2008.

[11] De Villarreal ESS, González-badillo JJ, Izquierdo M. Low and moderate plyometric training frequency produces greater jumping and sprinting gains compared with high frequency. *J Strength Cond Res*. 22:715–725, 2008.

[12] González-Badillo JJ, Marques MC, Sánchez-Medina L. The importance of movement velocity as a measure to control resistance training intensity. *J Hum Kinet*. 29: 15–19, 2011.

[13] González-Badillo JJ, Pareja-Blanco F, Rodríguez-Rosell D, Abad-Herencia JL, Del Ojo-López JJ, Sánchez-Medina L. Effects of velocity-based resistance training on young soccer players of different ages. *J Strength Cond Res*. 29: 1329-38, 2015.

[14] Jimenez-Reyes P, Pareja-Blanco F, Cuadrado-Peñafiel V, Morcillo JA, Párraga JA, González-Badillo JJ. Mechanical, metabolic and perceptual response during sprint training. *Int J Sports Med*. 37:807-12, 2016.

[15] Kobal R, Loturco I, Barroso R, Gil S, Cuniyochi R, Ugrinowitsch C, Roschel H, Tricoli V. Effects of different combinations of strength, power, and plyometric training on the physical performance of elite young soccer players. *J Strength Cond Res.* 31:1468-1476, 2017.

[16] López-Segovia M, Dellal A, Chamari K, González-Badillo JJ. Importance of muscle power variables in repeated and single sprint performance in soccer players. *J Hum Kinet*. 40: 201-11, 2014.

[17] Mero A, Komi PV, Gregor RJ. Biomechanics of sprint running: A review. *Sports Med*. 13:376-392, 1992.