Impulsion Vertical Characterization in Game Action of Blockers and Defenders in Sex Role in the Circuit World Beach Volleyball 2014

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Abstract— **Introduction: Volleyball presents movements in their basic fundamentals, involving as an important factor of success or failure the vertical jump, such as serve, block, attack and counter attack. Objective: This study aimed to identify and quantify the number of jumps performed by blockers players and defenders during the stages of the World Championship Beach Volleyball FIVB 2014. Materials and Methods: Data were effectively 20 athletes, 10 male and 10 female, where males aged (27.35 ± 3.94) for blockers (n = 5), height (2.00 ± 0.06) and body mass (92.0 ± 6.99) has for defenders (n = 5), age (27.82 ± 4.81), height (1.92 ± 0.05) and body mass (83.9 ± 8.92). In the female age (27.52 ± 4.81) for blockers (n = 5), height (1.84 ± 0.04) and weight (70.2 ± 4.51) while defenders (n = 5) were (26.32 ± 3.42) for age, height (1.79 ± 0.05) and weight (67.4 ± 4.48) that at least played five rounds of the World Beach Volleyball Tour 2014. Result: There was a difference in relation to the number of jumps between the blockers and defenders in both sexes in the different evaluated actions and the total jumps. Conclusion: The study revealed that the amount of jumps performed by elite athlete's beach volleyball depends on the number of sets played, and the strategy adopted for each team.**

Index Terms— **beach volleyball, game strategy, vertical jump.**

I. INTRODUCTION

The vertical jump is used in several sports during the tests or games such as basketball, volleyball, high jump, among others. In volleyball, in particular, is clairvoyant that the vertical jump is capital for the development of more complex motor acts as serve, block, attack and counterattack [1]. In view of its importance, many studies are performed to elucidate the variables that determine performance in this

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motor action, such as frequency of weekly training, duration of training and intensity.

Reference [2], in his study describes what is one of the main engines used gestures in the sport is the athlete vertical takeoff and attached to the height of it may be the main advantage for elite athletes.

In designing [3], the vertical jump is very important in volleyball, because it is directly related to the athlete's performance on wanted about offensive actions (attack), defensive (blocking), serve and other explosive action sport.

In theirs article [4], cites that the average jumps for games is 52 to 85 jumps per athlete, according to information from other surveyed references.

Based on the literature review, few studies have investigated the numbers of jumps during games [5]-[6]-[4]. Such information about the physical actions is required in order to design appropriate and specific training protocols.

However, some authors only refer to hours of training (volume) [7]-[8]-[9]. It is known that during a season the number of rallies (time the ball remains in the air at game) is great in the championships which requires other athletes with respect to jumps performed in the games, and this great influence resulting from anthropometric characteristics, the position that the athlete acts (blocker or defender) and sex.

Authoritative this information, this study sought to quantitatively identify the types of jumps performed by players (blockers and defenders) on the World Tour in 2014.

Justified the present study was the need to understand is actually the vertical jump is a differential in the high-performance volleyball. Thus, it is interesting clarification on how the number of jumps can and should be worked in the sport. As a result, may be established parameters of control and monitoring for the loads are applied as well as training of prescribing strategies more scientifically organized and adapted to the needs of beach volleyball.

II. METHODOLOGY

The sample was composed by athletes of the five best doubles beach volleyball ranking of the International Federation of volley ball (FIVB)[10], a total of 20 athletes, 10 male and 10 female where masculine with age (27.35 ± 3.94) for blockers (n=5) and (27.82 ± 4.81) for the defenders (n=5). In females (27.52 ± 4.81) blocker (n=5) and (26.32 ± 3.42) for the defenders (n=5), at least, played five stages of the World Tour Volleyball 2014 beach was analyzed a total of 42 matches (17 male and 25 female), 100 sets (37 male and 63

female), 3.643 points (1.387 male and 2.256 female), totaling 5.536 jumps (2.204 in men and 3.232 in women).

It was used for data collection a specific observation sheet that allowed the classification of different types of jumps, according to the athlete's function on court.

The sample selection methodology characterized as observational, because there is no intervention descriptive, for indicating results of evaluations and cross, to obtain the results at the time of data collection, the type only group [11].

The sample was non probabilistic for convenience (or accidental), it was formed by those elements or instances that have appeared and have been possible to achieve until the sample reached a certain size. In the specific case of this study, the sample was composed by double that, due to the dispute of the stages of the World Tour got through the 1st stage of the race (qualifying round).

For analysis and processing of data, this study used descriptive statistics and sample normal check through the Shapiro-Wilk test, observing the p>0.05. For inferential analysis based on the results of normality tests were carried out: In the comparison between anthropometric profiles of players, in the analysis of the jumps in relation to players, game situations and set were carried out test "t" Students for independent samples. For analysis of body proportion of players and correction of body weight was used to Phantom strategy [12]. We used the SPSS version 22.0 statistical package Statistics® for Windows® and Microsoft Excel® v. 2007.

III. ANALYSIS OF RESULTS

When performing the assessment comparing the anthropometric profile between players, blocker and defender, within each group, male and female, we observed a significant difference (p<0.05) in height (2.00 ± 0.06) and (1.92 ± 0.05) blocker and defender respectively and male blockers (1.84 ± 0.04) and defender (1.79 ± 0.05) in females. The same occurred in relation to body mass, which also showed a significant difference (p<0.05) among athletes in both groups. For the men they presented blockers (92.0 ± 6.99) and defenders (83.9 ± 8.29) in females (70.2 ± 4.51) and (67.4 ± 4.48) respectively.

For verification of the proportionality of body mass corrected athletes was used the Phantom strategy developed by [12], the height is 170.18 cm for standardizing and correcting the value of the body mass for the difference in height of athletes, where the mass of blockers was (56.7kg) and (58.4kg) to the defenders of the male group, while for the blockers was (55.5kg) and (57.9kg) for defenders.

By performing this process we observed that in both groups the defenders athletes are lower and are proportionately heavier than blockers athletes, heaviest female group proportionally than the male (Figure 1).
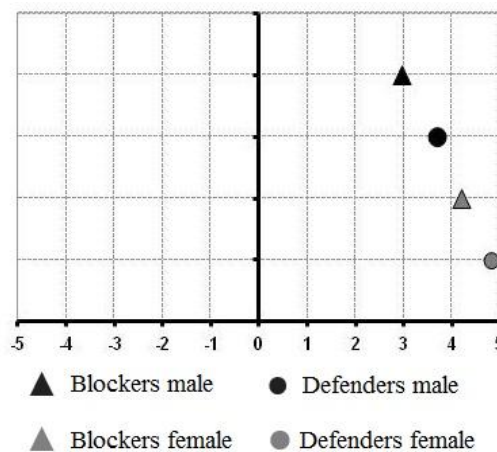

Figure 01 - Score-z Body Mass

Table 1 shows the mean and standard deviation of jumps performed in 17 matches in 3 sets, the withdrawal of shares, block, attack and counter-attack, as well as the percentage relative to the total of jumps between the blockers and defenders athletes male. Blockers athletes performed a greater number of jumps (n=1.343) than the defenders (n=861) totaling (60.93 %) and (39.07 %) respectively of the analyzed actions. However, supporters in the 1st set (n = 175), 2nd set (n = 148) and 3rd set (n = 33) in the serve made more jumps in relation to the block in the 1st set (n = 139), 2nd set (n = 142) and 3rd set (n = 18) respectively. In the attack the values found for the blockers were in the 1st set (n = 113), 2nd set (n = 130) and 3rd set (n = 15) while for the defenders were 1st set (n = 157), 2nd set (n = 127) and 3rd set (n = 63) showing that the defenders perform more jumps in the 1st and 2nd sets in relation to the blockers. We highlight in relation to counter attack the defenders made more jumps in 3 sets in relation to the blockers.

It was observed the same behavior of athletes in the female group where 25 games were performed and analyzed in 3 sets. The blocker athletes performed a greater number of jumps (n = 2.009) than the defenders (n = 1.223) total (62.15%) and (37.85 %) respectively of the analyzed actions. However, supporters in the 1st set (n = 193) and 2nd set (n = 212) in the serve made more jumps in relation to the block in the 1st set (n = 190) and 2nd set (n = 202), respectively (Table 2). Regarding the block action, the blocker showed higher number of hops in each set in relation to the defenders. In turn, the attack and counter attack was evident that the defenders made more jumps in each set in relation to the blockers.

Table 3 illustrates using the Student "t" Test, significant differences in the correlation made between sets, among the players themselves. It should be noted than male defenders had a higher number of correlations relative to the blockers; the 1st to the 2nd set, however, in females, the blockers had a higher number of correlations in relation to the serve of the 2nd to the 3rd set to the defenders.

Table 1 - Difference between blockers and defenders male in the number of jumps and percentage of different actions per set compared to 17 games

Athletes	Blocker (n=1343)			Defender (n=861)		
	1º set	2º set	3º set	1º set	2º set	3º set
Variables	$\overline{X}$ / SD	$\overline{X}$ / SD	$\overline{X}$ / SD	$\overline{X}$ / SD	$\overline{X}$ / SD	$\overline{X}$ / SD
Serve	8.18±2.48	8.35±2.45	1.06±2.38	10.29±3.60	8.71±3.12	1.94±5.15
Total jumps	139	142	18	175	148	33
Percentage (%)	10.35	10.57	1.34	20.33	17.19	3.83
Block	19.18±4.49	18.47±4.24	3.47±7.92	0.29±0.44	1.41±3.20	0.12±0.49
Total jumps	326	314	59	4	24	2
Percentage (%)	24.27	23.38	4.39	0.46	2.79	0.23
Attack	6.65±3.98	7.65±2.00	0.38±2.00	9.24±3.19	7.47±3.62	3.71±8.21
Total jumps	113	130	15	157	127	63
Percentage (%)	8.41	9.68	1.12	18.23	14.75	7.32
Counter Attack	1.71±1.49	2.53±1.77	0.88±2.23	3.00±1.54	3.29±1.83	1.24±3.01
Total jumps	29	43	15	51	56	21
Percentage (%)	2.16	3.20	1.12	5.92	6.50	2.44
Nº of all actions jumps	607	629	107	387	355	107

Mean ($\overline{X}$), Standard Deviation (SD), Number (N)

Table 2 - Difference between blockers and defenders female in the number of jumps and percentage of different actions for sets over 25 games.

Athlete	Blocker (n=2009)			Defender (n=1223)		
	1º set	2º set	3º set	1º set	2º set	3º set
Variable	$\overline{X}$ / SD	$\overline{X}$ / SD	$\overline{X}$ / SD	$\overline{X}$ / SD	$\overline{X}$ / SD	$\overline{X}$ / SD
Serve	7.00±3.49	8.08±4.45	3.04±3.61	7.72±3.05	8.48±3.39	3.74±3.60
Total jumps	190	202	76	193	212	71
Percentage	9.76	10.05	3.78	15.78	17.33	5.81
Blocke	15.16±4.10	15.88±6.02	6.68±7.34	1.04±1.79	1.08±2.23	0,32±0.82
Total jumps	379	397	167	26	27	6
Percentage	18.87	19.76	8.31	2.13	2.21	0.49
Attack	7.64±4.20	7.44±4.32	2.96±3.92	8.56±4.72	7.52±5.24	4.16±4.86
Total jumps	191	186	74	214	188	79
Percentage	9.51	9+26	3.68	17.50	15.37	6.46
Counter Attack	2.52±1.81	2.52±1.78	0.84±1.31	3.80±1.54	3.40±1.98	1.42±1.54
Total jumps	63	63	21	95	85	27
Percentage (%)	3.14	3.14	1.05	7.77	6.95	2.71
Nº of all actions jumps	823	848	338	538	512	183

Mean ($\overline{X}$), Standard Deviation (SD), Number (N)

Table 3 - Difference in the number of jumps between the sets of blockers and defenders of both genders.

	MALE					
Athlete	Blocker			Defender		
Actions /Sets	1º vs 2º	2º vs 3º	1º vs 3º	1º vs 2º	2º vs 3º	1º vs 3º
Serve						
Block	0.00*					
Attack						0.01**
CounterAttack		0.02**			0.00*	0.03**
	FEMALE					
Athlete	Blocker			Defender		
Actions /Sets	1º vs 2º	2º vs 3º	1º vs 3º	1º vs 2º	2º vs 3º	1º vs 3º
Serve					0,00*	
Block						0.04**
Attack		0.00*	0.00*			0.00*
CounterAttack	0.02**	0.00*	0.00*			

p<0,01*, p<0,05**, Versus (VS)

IV. DISCUSSION

The results collected during the five steps analyzed in the World 2014 FIVB circuit, showed that both male and female athletes provided significant differences with respect to the types of vertical jumps during the games according to their position, corroborating the study [5]. This research shows that the frequency of the use of certain jumps compared to other each are gender (60.93%) for male blockers (39.07%) and for the defenders, as well as, (62.15%) for blockers female (37.85%) and for the defenders.

However, in men's volleyball, we can say that there are differences in relation to the blocker by the 1st for the 2nd set, as compared to the defender, these differences occur in the attack actions and counter attack of the 2nd set for the 3rd set and the 1st set for the 3rd set.

In turn, the women's volleyball, there are differences of attack and counter attack by the 1st set blockers for the 2nd set, the 2nd set for the 3rd set and the 1st to the 3rd set. The defender showed differences in the serve of the 2nd set for the 3rd set and block and attack the 1st set for the 3rd set.

Another important fact to note is that in addition, the number of jumps of all actions of the 1st set (n=994) Male (blocker and defender) and (n=1.361) female (blocker and defender), 2nd set (n=984) and (n=1.360) are higher compared to the 3rd set (n=226) and (n=521) respectively in both genders, due to the first two sets are 21 points, while the 3rd is only 15 points. Another important factor is the highest number of female jumps in view that most games are played in three sets.

It is found using the results of the Student "t" Test that the differences between the sets show that the first set are more variable and unpredictable than the other. The reason for this may be related to the beginning of the game, which makes up the study among, athletes of which will be required in the game, which does not occur in relation to the second and third set. The analysis and interpretation these data allow managers may provide different strategies in sets of two and three sets, which in turn , the result of our investigation, it can be compared with those obtained in the study [4].

V. CONCLUSION

This study found that the beach volleyball elite players perform a high number of jumps in different actions during their games. Obviously, such amounts will depend on the strategy of each game. However, although the results of this study could lead to a guideline in the preparation of beach volleyball training programs, it should be based on the actual needs of each team. The differences observed in this study may be explained to some extent by tactical considerations, anthropometric characteristics, physical conditions and gender differences.

Regarding the block action, the blocker showed higher number of jumps in each set in relation to the defenders. In turn, the attack and counter attack was evident that the defenders made more jumps in each set in relation to the blockers. Because the opposing team adopted a strategy of direct service to the defender, thus giving the defender the first pass of serve reception and participating then the attack action with this totaling a greater number of jump.

Male and female blockers athletes performed a number of jumps higher than the defenders in the analyzed actions.

For a better understanding of the types of jump and its actual amount during the beach volleyball games, in order to establish specific training proposals, it is necessary further investigation. These limitations should be considered in future research to provide a better understanding of the performance and thus identify patterns of games suitable for different competitive levels. It is suggested that further investigations provide clues scientifically supported a larger number of players, sets, disputed points, games, and other variants.

Finally, this study is an effort to get more specific information that can contribute in some way to increase knowledge about training, monitoring and the best performance for athletes, specifically in beach volleyball mode, making room for new discussions that may have positive effects in practice.

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