Original Article

MEN'S HIGHT LEVEL VOLLEYBALL: ASSOCIATION BETWEEN GAME ACTIONS ON THE *SIDE-OUT*

VOLEIBOL MASCULINO DE ALTO NÍVEL: ASSOCIAÇÃO ENTRE AS AÇÕES DE JOGO NO *SIDE-OUT*

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RESUMO

O objetivo do presente estudo foi analisar o jogo praticado no *side-out* na Superliga de Voleibol Masculino 2014/2015. A amostra foi composta por 12 equipes, sendo analisados 142 jogos, totalizando 19545 ações de recepção, levantamento e ataque. Os resultados mostraram a associação entre o efeito da recepção e o local do ataque, o efeito da recepção e o tempo de ataque, o efeito da recepção e o efeito do ataque, o local de ataque e o tempo de ataque, o local do ataque e o efeito do ataque e o tempo de ataque e o efeito do ataque. Em resumo que no voleibol masculino brasileiro de alto nível, a qualidade da recepção influencia a organização do ataque, a determinação do local do levantamento e da estratégia de jogo. Além disso, o ponto de ataque foi o mais recorrente na análise dos jogos, com maior incidência dos ataques realizados na posição 3.
Palavras-chave: Análise de jogo. Voleibol. Side-out.

ABSTRACT

The aim of this study was to analze the game practiced in the *side-out* Men's Volleyball Superliga 2014/2015. The sample was composed by 12 teams, and we analyzed142 games, totaling 19,545 reception, setting and attack actions. The results showed associations between the reception result X the attack location; the reception X the attack tempo; the reception X attack result; the attack location X the attack tempo; the attack location X attack result, and the attack tempo and attack result. It showed that in the high level Brazilian Men's Volleyball, the reception quality influences the attack organization, the setting location and the game strategy. Also, the point of attack was the most frequent on the game analisys, with higher indices of attack from position 3.
Keywords: Game analysis. Volleyball. Side-out.

Introduction

Game analysis plays an important role in the development of several collective sports modalities, presenting itself as a determinant factor in the choice of pertinent indicators regarding players' performance in specific contexts[1]. It also aims to prepare the team for confrontation with the opponent, improve the quality of training and analyze the game structure[2].

Game analysis in Volleyball, regarding the effects of procedures that constitute it (serve, reception, set, attack, block and defense), is not recent. The game is characterized by two complexes: complex I (KI) or *side-out*, consisting of the sequence of actions formed by the reception, setting and attacking, and Complex II (KII) or *transition*, the sequence of actions formed by the serve, block, defense and counterattack[3]. When comparing both game complexes, it is observed that the *side-out* is the game complex that scores the most [4] and allows the effective attack right after the reception to the opponent's serve[5].

Attack actions play a relevant role in a team success[6-8] and the fastest attacks (1st and 2nd tempo) have positive results when compared to slower attacks (3rd tempo), as they offer the opponent less time for defensive organization[9]. Thus, offensive actions assume different characteristics, namely due to the distribution characteristics, the defensive systems adopted by the opponent, the area where the attack is completed[8] and the attack tempo, the latter being determined by a time scale in which the 1st tempo attack is the fastest[10].

In addition, the first-touch quality relation is seen in the attack effectiveness[11], with the side-out attack the most significant to win the set and the match[4]. Consequently, the reception quality is a factor that conditions the attack possibilities[12-15], evidencing that low-quality receptions are associated with attack errors, while high-quality receptions are related to attacks points[11,14-16].

Therefore, the attack assumes variants of technical execution in the search for new finishing options, be it with an attack with and without touching the block or a hard-driven and placed attack[17]. Despite the attack variability and diversification, the most common type of attack is the hard driven spike[11,16,18] and its use depends on emerging specificities related to the opponent's defensive system[17].

However, most articles on game analysis have reported on the relationship between the game actions quality and the attack effectiveness, disregarding the association between all the *side-out* gameplay procedures. Therefore, the present study aims to analyze the association between *side out* actions (reception effect, attack tempo, place of attack and attack effectiveness) in the 2014/2015 Men's Volleyball Super League.

Methods

Sample

Our sample consisted of the 12 participating teams of the 2014/2015 Brazil Men's Super League. In this sense, we observed 142 games of the 151 games of this Super League. We analyzed at least 22 games and a maximum of 26 games of each participating team, totaling 19,545 actions of reception, setting and attack. Wrong receptions were excluded from the sample, since they did not allow for the continuation of the action and subsequent accomplishment of the attack. It is noteworthy that Brazil consistently ranks among the top three national men's volleyball teams in the world (www.fivb.org), and most of its players plays in the Brazilian Super League.

Variables

Reception Result: Corresponds to reception quality and its influence on the building of the attack. We adapted the instrument proposed by Eom and Schutz[6] to evaluate the reception quality. The following grading scale was used:
- Poor reception (C): reception that did not allow for the attack organization, evidencing the location of the attack distribution.
- Moderate Reception (B): Reception that allowed for an organized attack, although not all attackers were available for the attack; more specifically, it reduced the chances of rapid attacks.
- Excellent Reception (A): Reception that allowed for an organized attack with all attackers available for the attack.

Attack tempo: corresponds to the moment of the attack action regarding the time relationship between the attacker, the setter and the ball. We adapted Afonso et al.[10] categories as follows:

- 1st tempo: the attacker jumped during or immediately after the set, and a step may be taken after the set;
- 2nd tempo: the attacker took two or three steps after the set;
- 3rd tempo: the attacker waited for the ball to reach its peak in the ascending trajectory and only then began the attack.

Attack effectiveness: it was measured using an adaptation of the instruments proposed by Eom & Schutz[6] and Marcelino, Mesquita and Sampaio[19]. We obtained the following categories:

- Attack error: The attacker failed in the attack, since the ball was in the net, went out or some infraction to the regulation occurred.
- Attack block: the attack was blocked and resulted in a point for the opponent.
- Continuity: the attack action did not result in a terminal action and allowed the opponent a counterattack.
- Point of Attack: The attack resulted in a direct point as the ball touched the opponent's court or was deflected by blocking off the court.

Location of attack: the distribution of the attack positions (Figure 1) was used according to the official rules published by the International Volleyball Federation. Since there was no attack at position 5 (mostly used by the libero), we used the following descriptions:

- Position 1: located between the right sideline, the end line, the attack line (3-meter line) and three meters to the left of the right sideline;
- Position 2: located between the right sideline, the center line, the attack line (3- meter line) and three meters to the left of the right sideline;
- Position 3: located between 3m of the right sideline, center line, the attack line (3-meter line) and 3 meters to the right of the left sideline;
- Position 4: located between the left sideline, the center line, the attack line (3-meter line) and three meters to the right of the left sideline;
- Position 6: located between 3m of the right sideline, the end line, the attack line (3-meter line) and 3 meters to the right of the left sideline.
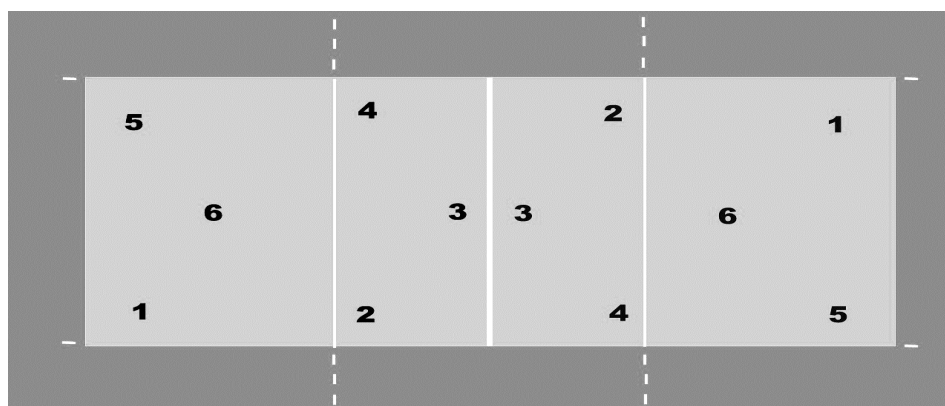

Figure 1. Distribuition of players positions in court.

Source: The authors.

Data collection procedure

All games were recorded from the top perspective, that is, about 7-9 meters (23-29,5 feet) behind the end line, with the camera positioned approximately 3 meters (ten feet above ground level for better viewing of video scenes. A Sony camera with 1080p HD definition and a frequency rate of 60 Hz was used. Observers were volleyball statisticians with at least 5 years of experience in this specific function and Physical Education graduates, in order to ensure the criteria consistency and the data coding quality. In addition, they analyzed the games using the Data Volley 2014.

Statistical Procedures

We used descriptive statistics for the exploratory analysis, which gave us the frequencies and respective percentages for each of the studied variable categories. The Chi-square test was used for the association between the variables, together with the Monte Carlo correction whenever less than 20% of the cells had a value lower than 5. Residual adjustments were calculated to identify the cells with statistical significance in explaining the relationship between two variables. Thus, a relationship is only taken in consideration when values were higher than │2│. When values were lower than -2, it meant that the attack result was less than the expected, while values greater than 2 corresponded to more than the expected. The SPSS software (Statistical Package for the Social Sciences) version 20.0 for Windows was used to process the data.

Twenty percent of the actions were reexamined for the reliability calculation, exceeding the reference value of 10%[20]. Cohen's Kappa values ranged from 0.90 to 1.00 for interobserver reliability, and from 0.94 to 1.00 for intraobserver reliability. In this sense, the reliability values are above the reference value, which is 0.7521.

Results

The inferential analysis of the collected data showed a statistically significant association (X^2 = 2196.767; p <0.001) between the reception result and the location of the attack (Table 1).

The descriptive analysis of the data showed that after reception A, there were more attacks at position 4; after reception B, more attacks were carried out at positions 2 and 3, and after reception C, there was a higher frequency of attacks at position 2. Furthermore, we observed that positions 2, 3 and 4, respectively, were the most requested, regardless of the reception effectiveness. The inferential analysis allowed us to notice the following: attacks in positions 4, 6 and 3 were more than the expected after reception A, whereas attacks at positions 1 and 2 were less than the expected; there were more than the expected attacks at positions 2 and 3 after reception B, and less than the expected attacks at positions 1, 4 and 6; after reception C, there were more than expected attacks at positions 1 and 2 and less than expected attack at positions 3, 4 and 6.

Table 1. Relationship between the reception result and the location of attack.

			Location of attack					Total
			Position 1	Position 2	Position 3	Position 4	Position 6	
Result of reception	Reception A	Occured	924	2,026	2,823	3,210	659	9,642
		% of reception	9.6%	21.0%	29.3%	33.3%	6.8%	100.0%
		% location of attack	45.2%	34.0%	52.8%	61.0%	71.3%	49.3%
		Adjusted residual	-4.0	-28.5	5.9	19.8	13.7	
	Reception B	Occured	587	2,639	2,436	1,476	265	7,403
		% of reception	7.9%	35.6%	32.9%	19.9%	3.6%	100.0%
		% location of attack	28.7%	44.2%	45.5%	28.1%	28.7%	37.9%
		Adjusted residual	-9.0	12.2	13.5	-17.2	-5.9	
	Reception C	Occured	534	1,300	91	575	0	2,500
		% of reception	21.4%	52.0%	3.6%	23.0%	0.0%	100.0%
		% location of attack	26.1%	21.8%	1.7%	10.9%	0.0%	12.8%
		Adjusted residual	19.1	25.0	-28.5	-4.7	-11.9	
Total		Occured	2,045	5,965	5,350	5,261	924	19,545
		% of Total	10.5%	30.5%	27.4%	26.9%	4.7%	100.0%

Source: The authors.

The inferential analysis of the data collected showed that there was a statistically significant association (X^2 = 5924,134 p <0.001) between the reception efficacy and the attack tempo (Table 2).

Table 2. Relationship between the reception result and the attack tempo.

			Attack Tempo			Total
			1st tempo attack	2nd tempo attack	3rd tempo attack	
Result of Reception	Reception A	Occurred	4,550	4,393	699	9,642
		% reception result	47.2%	45.6%	7.2%	100.0%
		% attack tempo	56.7%	60.9%	16.2%	49.3%
		Adjusted residuals	17.3	24.7	-49.2	
	Reception B	Occurred	3,343	2,402	1,658	7,403
		% reception result	45.2%	32.4%	22.4%	100,0%
		% attack tempo	41.7%	33.3%	38.5%	37,9%
		Adjusted residuals	9.2	-10.2	,9	
	Reception	Occurred	126	424	1,950	2,500
		% reception result	5.0%	17.0%	78.0%	100.0%
		% attack tempo	1.6%	5.9%	45.3%	12.8%
		Adjusted residuals	-39.2	-22.2	72.3	
Total		Occurred	8,019	7,219	4,307	19,545
		% of Total	41.0%	36.9%	22.0%	100.0%

Source: The authors.

The descriptive analysis of the data showed that: there were more attacks of the 1st and 2nd tempo after reception A; there were more attacks of 1st and 3rd tempo after reception B; and there were more attacks of the 3rd tempo after reception C. Moreover, we observed that the 1st tempo attacks were the most requested, regardless of the reception result. We noticed from the inferential analysis that: there were more than the expected attacks of 1st and 2nd tempo after reception A, and less than the expected of 3rd tempo attacks; there were more than the expected of 1st tempo attacks after reception B, and less than the expected of 2nd tempo; there were more than the expected of 3rd tempo attacks after reception C and less than the expected of 1st and 2nd tempo attacks.

The inferential analysis of the collected data showed that there was a statistically significant association ($X^2 = 349.992$ p <0.001) between the reception result and the attack result (Table 3).

Table 3. Relationship between the reception result and the attack result.

			Point of attack	Attack Defense	Attack Block	Attack Error	**Total**
				Attack result			
Reception result	Reception A	Occurred	5,856	1,643	1,283	860	9,642
		% of reception result	60.7%	17.0%	13.3%	8.9%	100.0%
		% attack result	55.2%	43.3%	39.6%	45.3%	49.3%
		Adjusted residual	17.8	-8.2	-12.1	-3.7	
	Reception B	Occurred	3,635	1,592	1,403	773	7,403
		% of reception result	49.1%	21.5%	19.0%	10.4%	100.0%
		% attack result	34.2%	42.0%	43.3%	40.7%	37.9%
		Adjusted residual	-11.4	5.8	7.0	2.7	
	Reception C	Occurred	1,126	556	551	267	2,500
		% of reception result	45.0%	22.2%	22.0%	10.7%	100.0%
		% attack result	10.6%	14.7%	17.0%	14.1%	12.8%
		Adjusted residual	-10.0	3.9	7.9	1.7	
Total		Occurred	10,617	3,791	3,237	1,900	19,545
		% of Total	54.3%	19.4%	16.6%	9.7%	100.0%

Source: The authors.

The descriptive analysis of the data showed that regardless of the reception effectiveness, the most frequent attack result was the point of attack. The inferential analysis showed that: the point of attack was more than the expected after reception A and the defense of the attack, the attack block, and the attack error were less than the expected; the defense of the attack, the attack block, and the attack error were more than the expected after receptions B and C and the point of attack was less than the expected.

The inferential analysis of the data collected showed that there was a statistically significant association ($X^2 = 12792,400$ p <0.001) between the attack location and the attack tempo (Table 4).

Table 4. Relationship between the attack location and the attack tempo.

			Attack tempo		Total
		1st tempo attack	2nd tempo attack	3rd tempo attack	
Local do ataque	Position 1	Occurred	0	1,511	534	2,045
		% attack location	0.0%	73.9%	26.1%	100.0%
		% attack tempo	0.0%	20.9%	12.4%	10.5%
		Adjusted residual	-39.9	36.6	4.7	
	Position 2	Occurred	1,883	2,260	1,822	5,965
		% attack location	31.6%	37.9%	30.5%	100.0%
		% attack tempo	23.5%	31.3%	42.3%	30.5%
		Adjusted residual	-17.8	1.8	19.0	
	Position 3	Occurred	5,350	0	0	5,350
		% attack location	100.0%	0.0%	0.0%	100.0%
		% attack tempo	66.7%	0.0%	0.0%	27.4%
		Adjusted residual	102.9	-65.7	-45.6	
	Position 4	Occurred	786	2,524	1,951	5,261
		% attack location	14.9%	48.0%	37.1%	100.0%
		% attack tempo	9.8%	35.0%	45.3%	26.9%
		Adjusted residual	-45.0	19.4	30.8	
	Position 6	Occurred	0	924	0	924
		% attack location	0.0%	100.0%	0.0%	100.0%
		% attack tempo	0.0%	12.8%	0.0%	4.7%
		Adjusted residual	-26.0	40.7	-16.6	
Total		Occurred	8,019	7,219	4,307	19,545
		% of Total	41.0%	36.9%	22.0%	100.0%

Source: The authors.

The descriptive analysis of the data showed that when the attack occurred in positions 1, 2, 4 and 6, the second attack tempo was used more frequently, whereas when the attack occurred in position 3, there were more first tempo attacks. After the inferential analysis, we observed that: 2nd and 3rd tempo attacks were more than the expected in positions 1 and 4, and 1st tempo attacks were less than the expected; 3rd tempo attacks were more than the expected in position 2, and 1st tempo attacks were less than the expected; 2nd tempo attacks were more than expected in position 6 and 1st and 3rd tempo attacks were less than expected; 1st tempo attacks were more than the expected in position 3 and 2nd and 3rd tempo attacks were less than the expected.

The inferential analysis of the collected data showed that there was a statistically significant association ($X^2 = 800.765$ p <0.001) between the attack location and the attack efficacy (Table 5).

The descriptive analysis of the data showed that regardless of the location of the attack, the most prevalent result of the attack was the point of attack. After the inferential analysis, we observed that: the defense of the attack was more than the expected in position 4, and the point of attack was less than the expected; the point of attack and the attack error were more than the expected in positions 1 and 6, and the defense of the attack and attack block were less than the expected; the attack block and the attack error were more than the expected in position 2, and the point of attack and the defense of the attack were less than the expected;

the attack point was more than the expected in position 3 and the defense of the attack, the attack block and the attack error were less than the expected.

Table 5. Relationship between the attack location and the attack result.

			Attack Result				
			Point of attack	Attack Defense	Attack Block	Attack Error	**Total**
Attack Location	Position 1	Occured	1,209	350	259	227	2,045
		% attack location	59.1%	17.1%	12.7%	11.1%	100.0%
		% attack result	11.4%	9.2%	8.0%	11.9%	10.5%
		Adjusted residual	4.6	-2.8	-5.0	2.2	
	Position 2	Occured	2,940	954	1,382	689	5,965
		% attack location	49.3%	16.0%	23.2%	11.6%	100.0%
		% attack result	27.7%	25.2%	42.7%	36.3%	30.5%
		Adjusted residual	-9.4	-8.0	16.5	5.7	
	Position 3	Occured	3,477	898	606	369	5,350
		% attack location	65.0%	16.8%	11.3%	6.9%	100.0%
		% attack result	32.7%	23.7%	18.7%	19.4%	27.4%
		Adjusted residual	18.4	-5.7	-12.1	-8.2	
	Position 4	Occured	2,455	1,441	873	492	5,261
		% attack location	46.7%	27.4%	16.6%	9.4%	100.0%
		% attack result	23.1%	38.0%	27.0%	25.9%	26.9%
		Adjusted residual	-13.0	17.2	0.1	-1.1	
	Position 6	Occured	536	148	117	123	924
		% attack location	58.0%	16.0%	12.7%	13.3%	100.0%
		% attack result	5.0%	3.9%	3.6%	6.5%	4.7%
		Adjusted residual	2.3	-2.7	-3.3	3.8	
Total		Occured	10,617	3,791	3,237	1,900	19,545
		% of Total	54.3%	19.4%	16.6%	9.7%	100.0%

Source: The authors.

The inferential analysis of the data collected showed that there was a statistically significant association (X^2 = 402.418 p <0.001) between the attack tempo and the attack efficacy (Table 6).

The descriptive analysis of the data showed that the most recurrent attack result was the point of attack, regardless of the attack tempo. After the inferential analysis, we observed that: the attack point was more than the expected after the 1st tempo attack and the defense of the attack, the block, and the error were less than the expected; the attack error was more than the expected after a 2nd tempo attack, and the attack point was less than the expected; the attack defense, the block and the error were more than the expected, after a 3rd tempo attack, and the attack point was less than the expected.

Table 6. Relationship the attack tempo and the attack result.

			Attack result				**Total**
			Point of attack	Attack defense	Attack Block	Attack Error	
Attack Tempo	1st tempo attack	Occurred	4,918	1,323	1,131	647	8,019
		% attack tempo	61.3%	16.5%	14.1%	8.1%	100.0%
		% attack result	46.3%	34.9%	34.9%	34.1%	41.0%
		Adjusted residual	16.4	-8.5	-7.7	-6,5	
	2nd tempo attack	Occurred	3,837	1,420	1,165	797	7,219
		% attack tempo	53.2%	19.7%	16.1%	11.0%	100.0%
		% attack result	36.1%	37.5%	36.0%	41.9%	36.9%
		Adjusted residual	-2.5	0.7	-1.2	4.8	
	3rd tempo attack	Occurred	1,862	1,048	941	456	4,307
		% attack tempo	43.2%	24.3%	21.8%	10.6%	100.0%
		% attack result	17.5%	27.6%	29.1%	24.0%	22.0%
		Adjusted residual	-16.5	9.3	10.6	2.2	
Total		Occurred	10,617	3,791	3,237	1,900	19,545
		% of Total	54.3%	19.4%	16.6%	9.7%	100.0%

Source: The authors.

Discussion

In this section, we will analyze the descriptive data first and soon after we will carry out the inferential data analysis. The descriptive analysis of the data showed that receptions A and B were the most recurrent and enabled the sets to be carried out, mostly, to positions 2, 3 and 4, respectively. In addition, there was a greater use of 1st tempo attacks and these had a higher occurrence after receptions A and B. On the other hand, when analyzing reception C, we noticed a greater use of the attacks in position 2 and 3rd tempo attacks. As for the attack result, regardless of the reception result, we observed that the point of attack was the most recurrent and the attack error was less frequent. Our results are in agreement with Millán-Sanchez et al.[22], who observed the occurrence of most attacks at positions 2, 3 and 4, as well as the predominance of high quality receptions. Moreover, corroborating with our data, Marcelino et al.[23] showed that receptions A and B were the most frequent and allowed for the achievement of a faster game and for the point of attack. Thus, it is noticed that in the contemporary game, the reception effectiveness interfered in the setting strategy and the subsequent attack construction. In addition, we could infer that the high quality receptions, namely receptions A and B, led to attack strategies using the attackers in the attack zone, that is, in positions 2, 3 and 4, probably due to the greater probability of scoring, since these athletes were closer to the net.

When analyzing the attack tempo, we observed that our results disagreed with those of Panfil and Superlak[24], who found that the most used tempo was the 2nd, followed by the 3rd and the 1st tempo, respectively. In another study, Castro and Mesquita[17] noticed that the most commonly used attack tempo was the 2nd, followed by the 1st and 3rd tempo, respectively. They also observed a tendency to a faster game in order to score the point. This disagreement is most likely due to the volleyball evolution, since their studies used samples of the men's world championship of 2010 and 2005, respectively. As for the results of the attack, we verified that our data corroborate with Silva, Lacerda and João[25] who, after analyzing twenty-four games of the world league of 2010, observed a higher frequency of the point of attack. Thus, it can be said that men's teams are increasingly seeking to perform a faster game in order to overlap the opposing defense system. In addition, it can also be said that the type of game practiced in Brazil, that is, developed by the Brazilian school, has different

characteristics from the game played in other countries, due to the biotype and physical valences of Brazilian players. However, the prevalence of the point of attack is observed in the game played in men's high-level volleyball.

The analysis of the attack tempo in relation to the attack position showed that the 1st tempo attack occurred mostly in position 3, while the 2nd and 3rd tempo attacks were used with greater incidence in positions 2 and 4. When reviewing the literature, we did not find any paper carrying out this type of analysis. However, a study by Mesquita and César[26] showed a tendency to use the 2nd tempo attack in positions 1 and 2 in the 2004 Women's Olympics. A study by Afonso, Mesquita and Marcelino[27], in women's volleyball, observed that the attacks performed by the athletes in position 3 occurred, mostly, after the 1st tempo attack. In another study, Palao, Santos and Ureña[8] verified that there was a higher occurrence of attacks in position 4 and that the most used tempo in the men's volleyball was the 2nd tempo. In this sense, it is noticeable that in position 3, volleyball tends to be a fast game whereas it is a slightly slower in the ends, positions 4 and 2. This difference in the attack tempo is possibly due to the distance that the attackers are from the setter. While the position 3 player plays close to the setter, the players from the ends are far from him.

When considering the attack tempo in relation to the attack result, we noticed a greater use of 1st tempo attacks. Moreover, most of 1st and 2nd tempo attacks culminated in a point. However, we noticed that although the attack point occurred more frequently after the 3rd tempo, there was a reduction of points of attack and an increase of attack blocks or attack defense. Our results disagree with Afonso, Mesquita and Palao[28] who reported a higher frequency of 2nd tempo attacks. However, our results partially corroborate with Rocha and Barbanti[12], who reported a higher frequency of 2nd tempo attacks and that the point of attack was mostly obtained after 1st and 2nd tempo attacks, while the 3rd tempo increased the continuity of the game and the attack error. In this sense, the difference observed in their studies related to the attack tempo is most likely due to the evolution of contemporary volleyball, since the authors analyzed the Men's World Championship 2001 and the Men's Super League 1999-2000, respectively. Therefore, we can say that Brazilian volleyball evolved making the game faster, since this facilitates scoring the point due to the time constraint imposed on the defending team.

As for the attack location and its result, we noticed that the point of attack was the most frequent result in all positions, with a value higher than 60% in the attacks carried out in position 3. When analyzing the attack error, we noticed it was the least frequent result in all positions, with a higher frequency after attacks in position 2. These data agree with Rocha and Barbanti[12], since the attacks in positions 2, 3 and 4 resulted, most of the time, in points; also, the attacks carried out in position 3 were the ones that allowed for the scoring of more points. Moreover, the authors observed that the error is the least frequent result when compared to the continuity of the game and the point of attack. Thus, it is possible to say that men's high-level volleyball is characterized by the performance of a more aggressive game in order to reduce the occurrence of complex II.

The inferential analysis of the reception result with the attack position evidenced that the high quality receptions, reception A and B, led the game to position 3, while the low quality reception led the game behind the setter, that is, positions 1 and 2. Our results are in line with the trend of contemporary volleyball, which points to the need to perform a faster game[11,16,18,29], associating this type of game with position 3[30] due to the proximity of the setter to the attacker[24]. As for attacks after a low-quality reception, reception C, it can be inferred that the setter resorted to the attack of the opposing player, the athlete who carried out the attack, most of the times, in positions 1 and 2, since he plays essentially the function of attacker on the *side out*, as explained by Mesquita and César[26].

The association between the reception result and the attack tempo showed that the high quality receptions, reception A and B, enabled the game to be played faster, while the low reception, reception C, was related to a slower game, 3rd tempo attack. Our results are in agreement with Zetou et al.[31] who identified the relationship between high quality reception, rapid attack and scoring of the attack point. According to these authors, the setter organizes a better attack after an excellent reception, since the athletes participating in the reception are also available for the attack, that is, the setter has 4 attackers to choose in his offensive system. On the other hand, the opposite will happen when there is a low quality reception, that is, this will limit the distribution and the accomplishment of a faster game, since it does not allow for an organized attack.

When correlating the attack result to the reception, we observed that the high quality reception, reception A, correlated with the point of attack, while receptions B and C were associated with the continuity of the game or attack error. These results are in agreement with the game analysis studies[15,32,33], which observed the association of the reception with the attack result, noticing that the conditions of finalization depend on the reception quality. Moreover, these studies realized that good receptions, that is, those allowing for an organized attack, imposed difficulties to the opponents' defensive system, which generated the association of these with the point of attack.

The relationship between the attack location and the attack tempo revealed that the fastest attack, 1st tempo attack, correlated with position 3, the 2nd tempo attack was associated with positions 1, 4 and 6 and the 3rd tempo attack was related to the ends, that is, positions 1, 2 and 4. These results are in agreement with Laporta et al.[30] and Panfil and Superlak[24] who observed the association of the 1st tempo attack with position 3, since the setter is close to the attacker, facilitating the time-space relationship at the time of the attack. In addition, Panfil and Superlak[24] reported an association between the 2nd tempo attack and the ends of the net, positions 1, 2 and 4, due to the distance that the setter is from the attackers. It is possible to infer that the association of 3rd tempo attacks with the ends is due to the reception quality, since the low quality reception (reception C) was associated to 3rd tempo attacks. Costa et al.[34] reported that the attack error is related to slower attacks and double blocks, which are influenced by the quality of the reception. Thus, it is undeniable that the reception quality influences the setting location, therefore, the attack tempo, and the attack location. Also, the better the reception quality, the faster the setting and the more complex the offensive system, since all attackers will participate in the offensive play, whereas the low quality receptions, B and C, limit the participation of attackers and demand a slower set due to the restrictions imposed by the reception.

The association between the attack location with the attack result showed that positions 1, 3 and 6 correlated with the attack point, while positions 4 and 2 were associated with continuity of game or attack error. These data partially agree with Laporta et al.[30] who observed a positive association between position 3 and the attack point, whereas position 4 correlated with the continuity of the game. Probably, the association of position 3 with the point of attack is due to a faster game in this position, limiting the opponent's defensive organization. On the other hand, playing the game in positions 4 and 2 resulted in a slower game and allowed a larger number of blockers. Panfil and Superlak[24] partially corroborates with our results, since they found that positions 1 and 6 allowed for the organization of attacks with two or three hitters, making it difficult to organize the opponent's defensive system, allowing the scoring of the point[24].

When correlating the attack result with the attack tempo, we observed that the fastest game, 1st tempo attack, was associated with the attack point, while the 2nd and 3rd tempo attacks were associated with the continuity of the game and attack error. This game tendency

is in agreement with Stutzig et al.[3], Palao, Santos and Ureña[8] and César and Mesquita[35] who also reported the association of a faster game with the attack point. Therefore, a faster attack reduces the number of blockers[28], while restricting the time available for the opponent's defensive organization[36]. In this sense, it is possible to infer that the men's high-level volleyball emanates faster and faster settings in order to score the point and obtain the victory.

Conclusion

This study allowed us the following conclusions: receptions A and B were the most frequent; 1st tempo attacks took place mostly in position 3, while the 2nd and 3rd tempo attacks took place more often in positions 2 and 4; and most of the attacks culminated in a point after 1st and 2nd tempo attacks. However, the 3rd tempo attack showed a reduction of attack points and an increase in attack blocks and defenses. Moreover, the point of attack was the most frequent in all positions, with the highest scoring in position 3.

In this context, it is noticeable that Brazilian men's high-level volleyball is increasingly seeking excellence in the reception in order to build their attack. A fastest game, with the use of 1st tempo attacks, together with a greater mobilization of attack zone players (positions 2, 3 and 4) is necessary to score the point and overlap the opponent's defensive system.

Thus, it is possible to infer that, in high-level Brazilian men's volleyball, the reception quality influences the attack organization, the set location and the choice of the game strategy, namely the speed of distribution. Moreover, there is a tendency for teams to play with positions 1, 3 and 6 to score points, while positions 4 and 2 relate to game continuity or attack error. This type of game emerges from the use of the ends, positions 2 and 4, after low quality receptions and the game played in the central zone, positions 3 and 6, after the high quality receptions.

The practical analysis of the results found in this study can be applied for the preparation of men's teams in order to achieve a faster game in optimal conditions of distribution, reception A, as well as in situations with less offensive organization, such as reception B. Moreover, teams must increase the number of available attackers and play an intermediate speed game, specifically the 2nd tempo attack, after a low quality reception (reception C). The use of intermediate speed attacks, while allowing more time for the opponent's defensive system organization, also allows for a better offensive preparation, especially by the players who will participate in the attack. In this context, it is possible to use attackers in positions 1, 2, 4 and 6, who are less dependent on the reception quality than the attacker in position 3, thus, increasing the uncertainties of the opponent's block, as well as increasing the possibility of scoring.

Further studies are necessary in order to understand the relationship between the attack result and the situational constraints of each attack position, as well as the relationship with the *match status*. Also, it is necessary to compare the volleyball played in Brazil to the volleyball played in the international scenario.

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