

Analysis of time characteristics, jump patters and technical-tactical skills of beach volley men's final in Rio Olympics 2016

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ABSTRACT

In the men's final of Beach volleyball in the Rio Olympics 2016 Brazil won Italy team with 2-0 sets. The aim of this study was to find the a) timing characteristics, b) distribution of jumps, c) distribution of side-out and counter attacks, d) type of attack. Player's age was 29 ± 3.4 years and height was 196.5 ± 8.5 cm (Blockers = 203 cm, Defenders = 190 cm). A total of 78 points were played in the match (38.39 min). Distribution of rallies was: Serve errors = 7.7%, Aces = 5.1%, Side-outs = 59% and Counter attacks = 28.2%. The work duration was 7.6 ± 4.7 sec while the rest was 26.2 ± 17.7 sec (ratio = 3.5). The work alone duration without serve aces and errors was 8.6 ± 4.3 (ratio = 3). The rest alone without other intervals was 20.3 ± 6.1 (ratio = 2.4). The total number of jumps was 264 (66 ± 22.7 jumps per player) and the distribution of jumps was (Attack = 38.6%, Block = 31% and Servis = 30.3%). The attacks that blocked were 11.8% while the percentage of spikes was 52.8% and the shots was 47.2%. In conclusion, the results are in accordance with other articles concerning high level of beach volleyball. Coaches should use in the training sessions the specific demands of the work and rest ratio and adapt the rally distribution according to percentages occurring during the match and also use the performance indicators of the best teams in the world.

Keywords: FIVB; Beach volley; Rio Olympics; Jumps.

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INTRODUCTION

Beach volleyball is an Olympic sport since 1996 in Atlanta, USA (Couvillon, 2004). In the men's final of Beach volleyball in the Rio Olympics 2016 Brazil won Italy team with 2-0 sets.

Detailed understanding of number and type of jumps (Turpin et al., 2008), game and phases playing time, work, rest and ratio of them (Giatsis and Papadopoulou, 2003; Giatsis et al., 2005) are essential to establishing specific beach volleyball training protocols regarding players' physiological requirements in the highest level. Also, the analysis and assessment of technical-tactical skills in Beach volleyball are very useful to have measurable goals in training (performance indicators) (Papadopoulou et al., 2020).

The attack is divided in the spikes, and the shots. The most frequent technique used by players in men beach volleyball is the spike accounting for 60% of all attacks. Therefore, the 84 - 90% of attacks are made in the presence of blockers (Giatsis et al., 2015; Mesquita & Teixeira, 2004).

The attack efficiency is the most important factor for winning a match in beach volleyball (Giatsis & Tzetzis, 2003; Giatsis & Zahariadis, 2008). In the international tournaments organized by the FIVB and European CEV beach volleyball federations the attack during "Complex 1" (attack preparation directly after the serve) have a kill percentage of 59.9% (Giatsis et al., 2015).

The aim of this study was to find the timing characteristics, the distribution of jumps, the type of attack, the performance of teams and the distribution of side-out and counter attacks.

MATERIALS AND METHODS

Participants

The sample of participants were the four players participated in the Rio Olympics final in 2006 (Table 1). The height and the age of players were retrieved from FIVB and the Beach Volleyball Database websites. The men's final took place in the late evening with the use of floodlights, with air-temperature at 22° C, wind speed at 11 km/h, humidity at 88%, barometric pressure at 1021 Mb and light rain conditions (data retrieved from the official sheet of the game).

Table 1. The Height (cm) and Age (years) of players.

Country	Player	Specialization	Height	Age
Brazil	Alison	Blocker	203	30
Brazil	Bruno	Defender	185	33
Italy	Nikolai	Blocker	203	28
Italy	Lupo	Defender	195	25

The final in Rio Olympics 2016 was screen recording in a mac-book pro computer from the <https://www.olympicchannel.com>. QuickTime Player (version: 10.5) in normal speed, slow motion speed, and frame by frame modus was used to analyse every spike.

Measures

Timing characteristics

Work was defined as the time from when a player starts the approach for the service until the time the ball fall-down. Rest was defined as the time from when the ball touches the sand till the time of the player starts

the approach for the service. The data were classified as Work (W), Work alone (without aces and service errors) (WA), Total rest (R), Rest alone (without time-outs, intervals between sets and challenge delays).

Type of attack

Spike: Technique that involves hitting the ball hard with an open hand on a downward trajectory from above the top of the net; Shot: A relatively soft attack technique used to place a ball into an undefended area of the opponent's court. Common shots used in beach volley include: roll shots, in which the attacker puts a lot of topspin on the ball so that it has an arcing trajectory that will go over the block then drop quickly; cut shots, in which the shot crosses the net at sharp angles; pokeys, in which the ball is contacted with the attacking player's knuckles; and dinks, in which the ball is directed very softly low over the net (FIVB, 2019).

Distribution of game phases

Side out Phase: The rallies including only aces, serve errors and attack from the receiving team. Counter-attack Phase: The rallies including an attack after a successful defence of a team.

Team performance

Attack Kill percent: The percent of successful attacks; Attack efficiency: The percent of successful attacks minor the errors and blocks

Analysis

An intra-rater reliability analysis using Cohen's Kappa statistic was calculated to determine consistency of the observations of timing characteristics. The retest was done after a period of one week of the first test to avoid the possibility of carry-over, transfer, memory, and practice effects induced by familiarity with the assessment. There was almost perfect agreement between the two observations ($\kappa = .975$, $p < .001$). Data were analysed with SPSS 25.0.

RESULTS

The total number of rallies played in the final were 78 in 38.39 min (BRA vs ITA = 2-0 set). The mean height and age of players was 196.5 ± 8.5 cm and 29 ± 3.4 respectively (Figure 1).

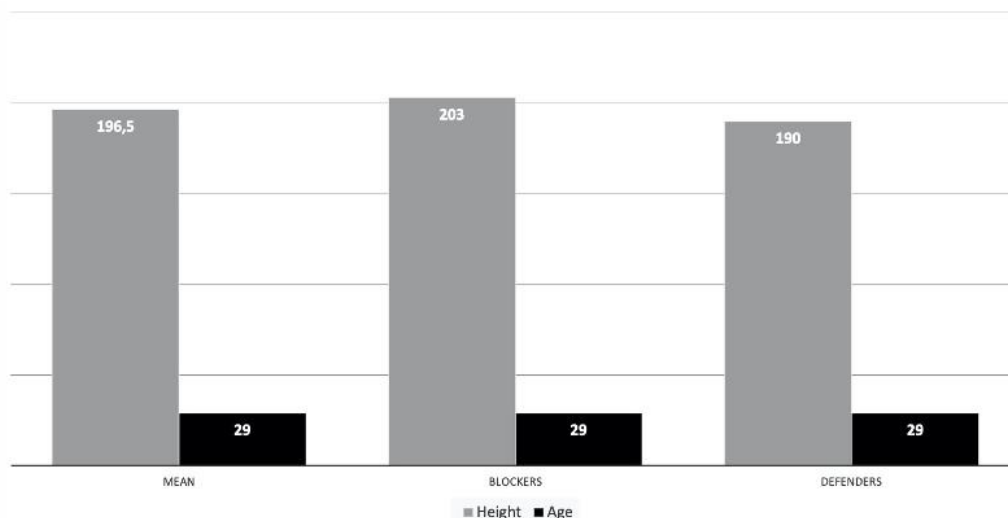


Figure 1. Means of the height (cm) and age (years) of players.

The total number of jumps done from the players was 264 with a mean number of the jumps per player was 66 ± 22.7 in a 2-0 set game (Attack = 38.6%, Block = 31% and Servis = 30.3%) (Figure 2).

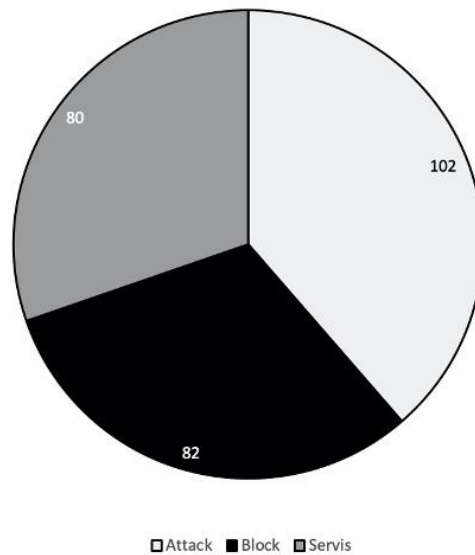
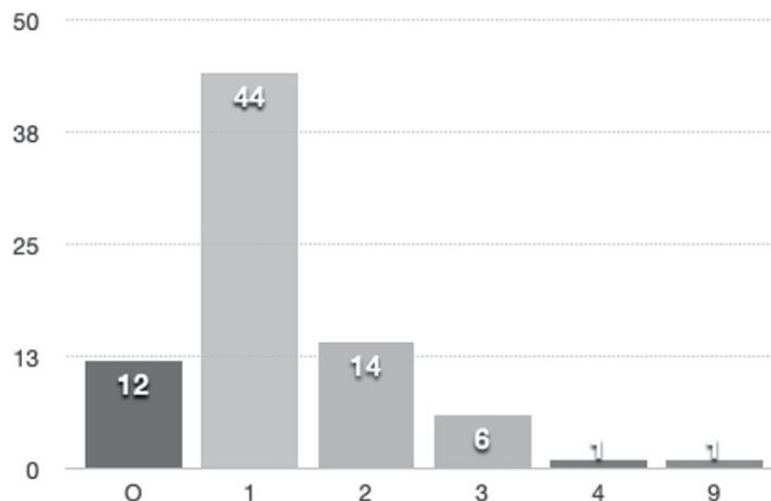


Figure 2. Jump pattern in the men's Rio 2016 Olympic final.

Players used the spike technique (53%) more than shots (47%). The 71.8 % of the phases was in Side-out and the 28.2% in Counter-attack. Also, the 56.4% (N = 44) of the rallies including only one attack, while the 15.4% (N = 12) was serve error or ace (Figure 3).



Note. Times that ball passed over the net. 0 = Serve error or aces; 1 = Side out phase; 2 – 9 = Counter – attack.

Figure 3. Number of rallies in the men's Rio 2016 Olympic final.

The mean work duration was 7.6 ± 4.7 sec while the rest was 26.2 ± 17.7 sec resulting to a rest-work ratio of 3.5. However, the work alone duration without serve aces and errors was 8.6 ± 4.3 (ratio = 3). The rest

alone without other intervals was 20.3 ± 6.1 (ratio = 2.4) (Figure 4). The longest rally lasts 33 sec with the ball passed over the net nine times.

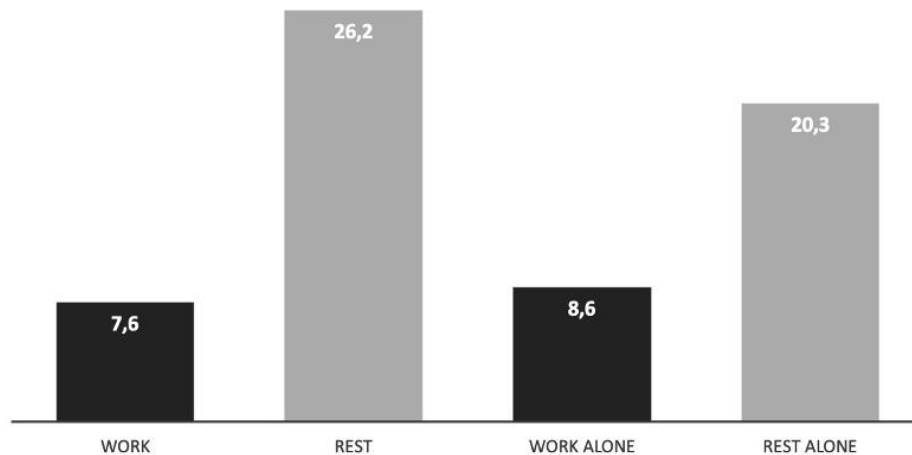


Figure 4. Means (sec) of work, work alone, rest and rest alone in the men's Rio 2016 Olympic final.

The Attack Kill percent and the Attack Efficiency were 57% and 39% for Brazil and 43% and 27% for Italy respectively. Also, the attacks that blocked was 11.8% (N = 11).

DISCUSSION

The means height of players (196.5 cm) agree with Tili and Giatsis (2011) where they presented the height and age of winners of all FIVB tournaments. Furthermore, the mean height of blockers was 203 cm which was 5 cm more than the findings of Tili and Giatsis (2011).

The number of jumps of a player could be varied in a Beach Volleyball game, depending on the specification, the tactic of the opponent team and the kind of serve the player used. In the final of Rio Olympics 2016 the mean of the jumps per player was 66 jumps in a 2-0 set game. A supposed third set would have increased this number of jumps. Since in beach volleyball tournaments there is a chance for a player to play up to 3 games in a day, this number can exceed 200 jumps in a day and increased even more if he specializes in blocker, performs jump serves and receives the most opponent service (Giatsis, 2001).

Players used the spike technique (53%) more than shots (47%). These percentages are slightly differed (60% for spikes) than Giatsis et al. (2015) found in a large number of FIVB games. This difference could be explained due to the importance of the game, weather conditions (light rain and wind speed) quality of sand (deep or hardpacked) or the attack tactic of the players.

The mean work duration was 7.6 sec and the rest was 26.2 sec resulting to a rest-work ratio of 3.5. However, the work alone was 8.6 sec and the rest alone was 20.3 sec (ratio 2.4). This ratio is more real for training adaptations as a 15.4% was aces and serve errors. Also, the 56.4% of the rallies including only one attack, means that coaches should use the side out phase in a 3 out of 5 times in ball training. However, long rallies

should be used during training as the longest rally in the Rio final lasted 33 sec and the ball passed over the net for nine times.

The Attack Kill percent and the Attack Efficiency were 57% and 39% for Brazil and 43% and 27% for Italy respectively. This difference explained the outcome of the match. The percentages of Brazil are in accordance with the findings in similar articles (Papadopoulou et al., 2020; Giatsis et al., 2015). However, a 11.8% of the attacks blocked by the blockers.

CONCLUSIONS

Detailed understanding of number and type of jumps, game and phases playing time, work, rest and ratio of them are essential to establishing specific beach volleyball training protocols regarding players' physiological requirements in the highest level. Therefore, conditioning programs should be adapted to meet the demands of a game in the highest level. Additionally, coaches should adapt rally duration during ball training according to rally distribution occurring during the match. During the drills, the coach should use competitive games focusing on the continuation of the rally in order to achieve the work times, which occur during matches. The work time should increase from time to time by setting up a third or fourth consecutive attack so that all work times occurring in Beach Volleyball matches are used. Intervals should be like intervals during the matches in order to achieve the proper work-to-rest ratio. Furthermore, increasing or decreasing the number of repetitions, work or rest duration, specific goals could be achieved depending on the period of the training. The Attack Kill percentage and Attack Efficiency of the winning team in the highest level could be used as performance indicators during training.

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