

# Serve analysis of professional players in beach volleyball

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## ABSTRACT

Jimenez-Olmedo JM, Penichet-Tomas A, Saiz-Colomina S, Martinez-Carbonell JA, Jove-Tossi MA. Serve analysis of professional players in beach volleyball. *J. Hum. Sport Exerc.* Vol. 7, No. 3, pp. 706-713, 2012. This study has been developed for the European Beach Volleyball Championship in 2005. The video-recorded analysis was held using Sportcode Pro v.8.5.2 software. The aim of study was to determine the types of serve used, depending on the time of the set in which they occur. Quantitative analysis with a sample of 10 players that make up 5 teams with a total of four meetings with a total of 327 serves analyzed. The serves were classified depending on the period which they occurred, the period being 1 (items 1 to 7), period 2 (from point 8 to 14) and period 3 (point 15 to 21). The statistical analysis was conducted using the statistical software SPSS 19, Chi-square test established significant differences between the different types of serve for period 1 and 2 ( $p < 0.05$ ), but no significant differences were established in the period 3 to floating serve and power jump ( $p > 0.05$ ). The results showed a decrease of using a serve with jump power at period 1 (89.7%) compared to the period 3 (27.3%), while the floating and floating serve jump respectively increase at period 1 (6.3% -4%) in the period 3 (23.4% -49.4%). **Key words:** BEACH VOLLEYBALL, PERFORMANCE ANALYSIS, SPORTCODE, BEACH VOLLEYBALL SERVES.

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E-mail: j.olmedo@ua.es  
Submitted for publication February 2012  
Accepted for publication July 2012  
JOURNAL OF HUMAN SPORT & EXERCISE ISSN 1988-5202  
© Faculty of Education. University of Alicante  
**doi:10.4100/jhse.2012.73.10**

## INTRODUCTION

Beach volleyball is a sport court divided (Hughes & Bartlett, 2002) in which two pairs of players, playing in a court of 8 x16meters. This sport, began on Santa Monica' beaches (USA) at the decade of the 30s in (Mata, 2004), particularly in 1927 (Kilary, 2000) being included in the Olympic Games program '96 Atlanta (Koch et al., 2009a).

From the study conducted in different sport's research, a solid line of research was based on notational analysis, describing the performance indicators and their influence on the game development (Gillet, 2009; Lupo, 2010). This type of research based on observation, allows to carry out a comprehensive analysis on tactics, technique, movement, and obtaining a database (Nevill et al., 2008). Also, it is a successful tool in generating the statistics in order to know the way of playing the opposite teams (Tilp et al., 2006), to provide athletes the most detailed information (Liebermann & Franks, 2004) to help them to face meetings with greater results.

In the particular sport of volleyball performance analysis studies have been much conducted using observational methodology (Lago et al., 2003) and more specifically in the case of beach volleyball, some authors have focused on the technical of players (Koch & Tilp, 2009) as well as in the description of pattern's movement of players (Cortell et al., 2011; Pérez-Turpin et al., 2009; Mauthner, 2004). Changing the rules at the competition system in 2003 has led to a modification in the development of the game itself (Grgantov et al., 2005; Giatsis et al., 2005), showing studies that have focused on the court dimensions and its effects on the development itself (Giatsis et al., 2003).

On the other hand, the literature has also focused on the relationship between success and unsuccessful points (Giatsis & Tzetzis, 2003), establishing this relationship, as the main factor in winning or losing matches played by sportmen. As a result, notational analysis has focused on purely technical and tactical elements, analyzing external influences and their relationship in achieving points in professional games.

Therefore, following the line of different authors, it is interesting to analyze separately some of the technical elements that are used in beach volleyball. One is the serve, being the time when the player starts with the ball.

Since this is the first attack that hits a couple, it is important to know which types serves are most commonly used during the match.

The literature studies based on both volleyball (Callejón, 2006), and beach volley (Koch, 2009b; Busca et al., 2012) over a game or globally in a tournament, not establishing differences in the type of service depending on the game time in which the player is.

The aimed was to know the different types of serve in a set depending on the period in which the players are establishing, whether there are significant differences between the use of one serve or another.

## MATERIAL AND METHODS

### *Participants*

The study sample was five men's teams with a total of 10 players of the world championship beach volleyball, the nationalities of Spain, Switzerland, Norway, Lithuania (1 team by nationality) and Germany (2

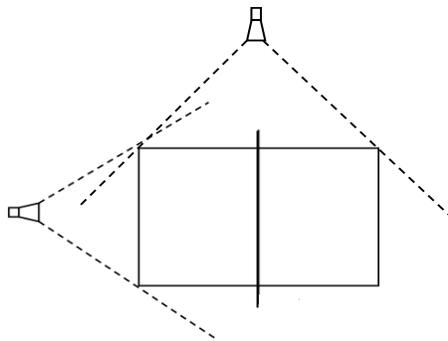
teams). The average values regarding: age  $30 \pm 4.6$  years, weight of  $87 \pm 5.3$  kg and height of  $1.90 \pm 0.04$  meters.

#### *Data collection*

The material on videotape for a notational analysis has a total of 4 games recorded during the UEFA European Beach Volleyball Championship in 2005.

For video recording, was used a camcorder Panasonic NV-GS21 recording mini-DV, LP (frontal plane) and a Sony recording Handycamm mini-DV, LP (flat side). The camera was positioned to take a frontal view in order to show the full court, particularly at a distance of five and a half meters from the baseline with a tripod, providing a height of. Three feet from the floor to the target (Figure 1) and a lateral camera, which similarly covered the entire court. This camera position allows us to see clearly all the actions that take place during the recording court, both on one side and the other (Callejón, 2006).

We analyzed the types of serve which occur throughout the game for both teams. A total of 327 serves were recorded.



**Figure 1.** Position of the video camera.

#### *Procedure and variables*

The analysis focuses on the type of service that occur in a game, and this technical element is one of the 6 most important in volleyball (Hughes & Franks, 2004). It developed a matrix analysis (Table 1), which collected all three types of pull analyzed: Float Serve (SF) Jump Float Serve (FS) Jump Serve (SP). For each of the sets analyzed, 3 score period were established as following:

- Period 1 (F1): From point 1 to 7.
- Period 2 (F2): Point 8 to 14.
- Period 3 (F3): From 15 to 21 point.

**Table 1.** Matrix observation.

<b>SF</b>	A service in which the ball describes an irregular non-breaking
<b>FS</b>	A service in which the ball describes an irregular trajectory with jump
<b>SP</b>	The action of a player at the time that the service is not in contact with the ground. The action should start jumping off the field, but on landing may come into contact with any part of the playing field or zone. This action is potentially

The visualization and analysis video recording was performed by 2 intra observation reliability on the recording procedure (Davies, 2008) and an inter- observation reliability test with a margin of error less than 5% (James et al., 2007)

To carry out the analysis of the videotapes was used SportCode v.8.5.2 software that allows the notational analysis for different sports, for it was followed the following sequence: A) Recording and digitization of images, B) Creation code matrix with the elements to be analyzed; C) Capture images for each codes, D) Combining the codes and obtaining a quantification of a rough actions analyzed.

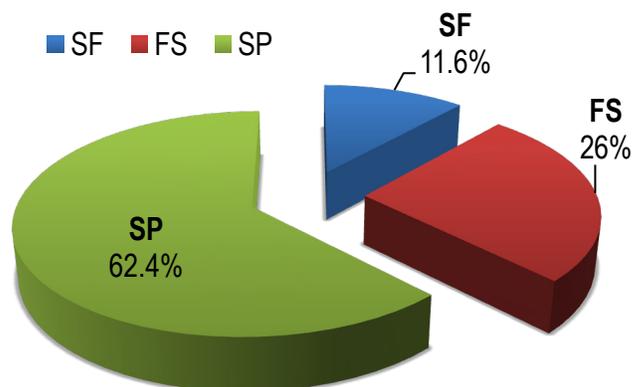
### Statistical Analysis

The statistical analysis was conducted using the statistical software SPSS 19 in order to calculate descriptive statistics and frequencies. The analysis to establish the significance ( $p < 0.05$ ) of quantitative data was performed using the Chi-square test.

## RESULTS

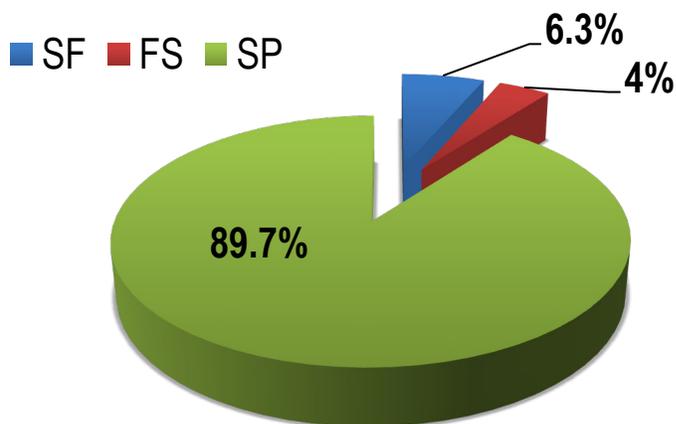
From all the serves by each game, it made a mean of  $10 \pm 7$  SF,  $21 \pm 8$  FS and  $51 \pm 10$  SP.

Overall, we found that 11.6% (38 serves) were float serve (SF), 26.0% (85 serves) were jump float serve (FS) and finally 62.4% (204 serves) were jump serve (SP) (Figure 2).



**Figure 2.** Total serves analyzed. SF= float serve; FS= jump float serve; SP= jump serve.

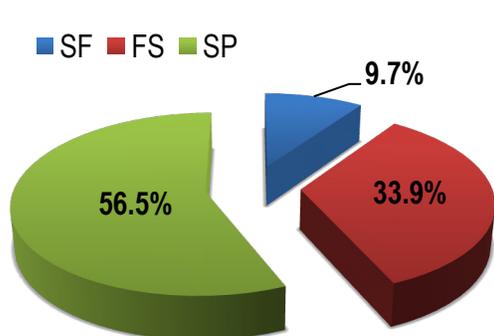
If we break down the attack carried out according to the 3 different periods in which they divided each of the sets analyzed, it has established that in the period 1 (F1) 6.3% (8 serves) were float serve (SF), 4.0% (5 serves) were jump float serve (FS) and 89.7% (113 servers) were jump serve (SP) (Figure 3).



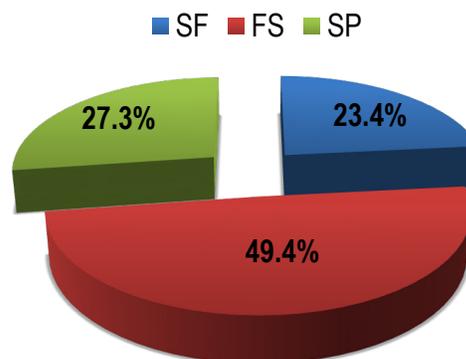
**Figure 3.** Period 1 serves. SF= float serve; FS= jump float serve; SP= jump serve.

During the period 2 (F2) of set, 9.7% (12 serves) were take out float serve (SF), 33.9% (42 serves), were jump float serves (FS) and 56.5% (70 serves) were jump serve (SP) (Figure 4).

Finally during period 3 (F3) of set, 23.4% (18 serves), were float serves (SF), 49.4% (38 serves), were jump float serve (FS) and finally on 27, 3% (21 serves) were jump serve (SP) (Figure 5).



**Figure 4.** Period 2 serves. SF= float serve; FS= jump float serve; SP= jump serve.



**Figure 5.** Period 3 serves. SF= float serve; FS= jump float serve; SP= jump serve.

Chi-square test used to establish the significance between different types of service within each period found that there were significant difference between the three types of serves ( $p < 0.05$ ) in period 1 (F1) and period 2 (F2). However, to get to the period 3 (F3), no significant differences between the float serve (SF) and the jump serve (SP) ( $p > 0.05$ ), and the others ( $p < 0.05$ ).

## DISCUSSION

Unlike other studies in both volleyball court (Alley, 2006), as in beach volleyball (Koch, 2009b; Search, 2012; Lopez-Martinez, 2009), does not differentiate or using serves depending of the set moment, if at the beginning or at the end.

In general, we observed both volleyball and beach volley, the most commonly used jump serve (SP). This type of service is most used in door (76% of the serves), and to keep in mind that the load's players volleyball is higher that beach volley, because there are a greater number of players who are switching more often and resting during more time. The biggest rest with volleyball players, that allows this type of attack, which have a higher energy requirement.

The float serve (SF), which is hardly used in volleyball (3%), in beach volleyball is almost as used as jump float serve (FS), because with this kind of serves are seeking certain areas and flight distortion on the ball's path (Takeshi et al., 2010) caused by the flight, creating difficulties in receiving on the opposing team.

Regarding to the use of different serve types depending on the period, we observed that during period 1 (F1) 89.7% are jump serve (SP), down to 27,3% in the range of period 3 (F3), the float serve (SF) goes from 6.3% in the period 1 (F1) to 23, 4% in the period 3 (F3), experiencing the largest increase the jump float serve (FS) goes from 4% during the period 1 (F1), to 49.4% in the period 3 (F3). We found that the power serve had an error of 17% in execution (López-Martínez, 2009). The fatigue as the match goes (Magalhaes, 2011) and the high error rate associated with this serve, players realize to get to the key points of the set or match, (during the period 3 (F3), are inclined to use them serves to ensure that the ball is put into play and ignore the use the serve as the first attack.

We should show that the fact that the endpoints set and game points are crucial to the victory of the set or match. At these levels the player experiences a high psychological pressure (Stefanello, 2009), so it is necessary to secure the points with serves that offer confidence to the player (SF and FS) before performing a powerful serve and less controllable (SP).

## CONCLUSIONS

We can therefore conclude that the jump serve (SP) is the most commonly used serve during the first period (F1), and this type of serve is the least used in the third period (F3).

As players approach the end of the set, prefer to use serves that offer guarantees of success, being the jump float serve (FS) the most used.

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