Differences in the Situational Parameters of Tennis Matches Between Winners and Losers in The Women's Main Draw Competition At Roland Garros 2022

Zlatan Bilić, Petar Barbaros, Stipe Čubrić

Faculty of Kinesiology, University of Zagreb, 10000 Zagreb, Croatia

ABSTRACT

Tennis is a world class competitive sport played under the rules of the International Tennis Federation. Also, tennis is characterized by repetitive actions of different types of strokes in match. The aim of this study was to determine if there are differences in the situational efficiency parameters between two groups of players (winners and losers) in the women's main draw competition at Roland Garros 2022. This study included 125 main draw matches. Differences in performance were analysed across 7 situational efficiency variables: aces, double faults, 1st serve average speed, 2nd serve average speed, winners, unforced errors and forced errors. The results showed significant differences between winners and losers group of players with the following parameters on the winners' side: winners (25.03/19.83; $p < 0.0071$) and unforced errors (22.80/29.06; $p < 0.0071$). The results demonstrated that there were no significant differences in double faults, 1st serve average speed, 2nd serve average speed, forced errors and aces. In addition to all the above, it is notable that more successful tennis players, as well as having more winners, record less unforced errors. The information obtained should be used by tennis coaches in planning trainings and preparing matches in order for their tennis players to achieve maximum results.

Keywords: match analysis, match statistics, player efficiency

INTRODUCTION

Performance in tennis consists of several interrelated parameters that include technical, tactical, psychological, and functional abilities (Kovacs, 2007). In order to achieve successful performance in tennis, female tennis players must develop many interrelated tennis skills to reach high level of success in a tennis match. Success or failure of any type of stroke in tennis can be a matter of

precision in terms of only several centimetres (Bower & Cross, 2005). To win a match, the number of errors must be reduced to a minimum, thus players with a higher percentage of accuracy of strokes are usually more successful. In top-level tennis, the precision of performing strokes is manifested through good ball placement into specific zones of the tennis field, depending on the situational conditions of a point (Kovacs, 2006). Playing the ball quickly into the planned part of the field is an important efficiency factor for winning a match among female tennis players. Quality ball placement and speed of the stroke are essential for attaining the best performance, and therefore their assessment is really important for the overall quality of the stroke (Terraza-Rebollo & Baiget, 2021). In addition to performing a stroke quickly and with precision, maintaining a high percentage of placing strokes into the field, during intensive periods in a match, presents a key component for winning in modern-day fast-paced tennis (Kovacs, 2007). Studies have shown that in terms of successful performance, speed and accuracy while performing strokes are closely linked (Maquirriain et al., 2016; Antúnez et al., 2012).

Quality among female tennis players is manifested in the ability of prolonging loss of strength, speed and consistency of strokes, which is essential for success during a tennis match. The effects of fatigue in tennis can be demonstrated as unforced errors, reduced speed and accuracy, poorer ball placement (reduction in footwork and poorer preparation for the stroke), as well as incorrect tactical choices (Davey et al., 2002; Girard & Millet, 2008). Upon analysis of competitive performances at Grand Slam tournaments, tennis players can be given insight into the characteristics of the observed parameters, which can thus be used to indicate relevant efficiency segments at the biggest competitions (Vorel, 2016). Research like this is providing results and guidelines about the differences among the analysed parameters in competitive performances that can determine the winner of a match on a clay tennis court. The parameters of situational efficiency that were analysed refer to the initial, middle, and final part of a tennis point.

METHODS

The sample of examinees consisted of 128 female tennis players who participated in matches of the main draw at Roland Garros 2022. Statistical data from 125 played matches was analysed. Two matches were not included in the analysis as they were not completed. Situational efficiency parameters were compared between two groups (winners and losers) in all matches of the main draw of the Roland Garros 2022 tournament. Situational efficiency of players was analysed by using seven dependent variables; aces, double faults, 1st serve average speed, 2nd serve average speed, winners, unforced errors, forced errors. Independent variables are two groups (winners and losers). The mentioned parameters of situational efficiency are officially tracked and collected on official website of Roland Garros 2022 (rolandgarros.com) and analyzed by Infosys system – official partner for data & match analytics of Roland Garros 2022.

Descriptive statistics parameters were calculated for all the variables: arithmetic mean ($\overline{x}$) and standard deviation (SD). Normality of distribution was tested by using the Kolmogorov Smirnov test. Using the Statistical Program v14.0.0 the median test showed that differences between the indicators of the competitive performance of the two groups of players (winners and losers) at the

RG 2022 were determined. The level of statistical significance was set at $p < 0.05$. After adjusting for multiple comparisons α was 0.0071. The obtained results are considered to be statistically significant if the level of significance is $p < 0.0071$.

RESULTS

Results of the analysis of the collected data determined differences between two groups (winners and losers) of female tennis players in matches, as is presented in Table 1. Using the Kolmogorov Smirnov test to determine the normality of the distribution it was found that 2 variables in the group of losers (2nd serve average speed and unforced errors) are normally distributed, while the other observed variables are not normally distributed.

The results presented in Table 1. indicate a statistically significant difference between two groups (winners and losers) of tennis players ($p < 0.0071$). Descriptive indicators of competitive performance and the results of the determined differences obtained with the median test between two groups of players who won and lost are presented in Table 1.

The obtained results show there is a statistically significant difference between two groups (winners and losers) in the following variables: winners and unforced errors. It should be noted that the mentioned variables mostly refer to the middle and final part of the tennis point during a match. The variables related to the quality of service performance (aces, double faults, 1st serve average speed and 2nd serve average speed) show that there is no statistically significant difference.

Table 1. Descriptive indicators of competitive performances and median test results of two groups of players (winners and losers)

Variable	Status	n	Mean	Minimum	Maximum	SD	Median	K–S	Median p
Aces	Winners	100	2.29	0.00	8.00	1.96	2.00	0.20	0.29
	Losers	100	1.73	0.00	10.00	1.83	1.00	0.17	
Double faults	Winners	100	3.08	0.00	10.00	2.27	3.00	0.17	0.15
	Losers	100	3.52	0.00	10.00	2.28	3.00	0.15	
1st serve average speed	Winners	100	155.44	112.00	175.00	11.52	157.00	0.12	0.12
	Losers	100	152.54	115.00	171.00	11.20	154.00	0.10	
2nd serve average speed	Winners	100	130.03	56.00	167.00	14.29	132.00	0.16	0.05
	Losers	100	127.79	97.00	157.00	10.33	128.00	0.07	
Winners	Winners	100	25.03	9.00	54.00	10.01	23.00	0.10	0.00*
	Losers	100	19.83	3.00	48.00	10.16	17.00	0.13	
Unforced errors	Winners	100	22.80	4.00	58.00	10.27	21.50	0.09	0.00*
	Losers	100	29.06	4.00	54.00	11.11	29.00	0.07	
Forced errors	Winners	100	19.50	4.00	45.00	9.13	18.00	0.13	0.01
	Losers	100	23.26	8.00	60.00	8.11	22.00	0.10	

* – level of significance $p < 0.0071$ (after Bonferronni correction)

DISCUSSION

The results of this research indicate that two group of players (winners and losers) do not differ in all the analysed situational parameters. Match winners group demonstrated results that indicate more consistent and precise performance of strokes throughout the entire match. This can be noticed on the basis of a lower number of forced and unforced errors, as well as a higher number of winners, which demonstrates that group winners of matches have a more active game, i.e., more domination in the middle part of the point. If one analyses previous research that addressed statistical parameters in matches on clay surfaces, the conclusion can be made that such matches demonstrate longer duration of points when compared to other playing surfaces, which precisely underlines the relevance of the middle part of the point (Fernandez et el., 2006; O'Donoghue & Ingram, 2001). The results obtained in this research indicate that more active, however, at the same time safer play, leads to a positive outcome in tennis matches. The afore mentioned is also confirmed by another earlier research (Vorel, 2016) where the differences between two groups (match winners and losers) originated precisely in efficiency parameters for the middle and final part of the point. The mentioned research also determined that group of players who won have more winners, with a significantly lower incidence of unforced errors. In addition, it should be mentioned that pervious research also found that the number of winner strokes is in correlation with the playing characteristics of group of players who won (Filipčić et al., 2008). A lower number of forced and unforced errors can be interpreted as a result of better training, where group of winners in matches, as a result of their physical conditioning preparation and quality of technical performance, succeed in preserving the playing initiative and waiting for a mistake by their opponent or creating an opportunity for performing a winner in high-tempo points. Winners matches group do not allow for an opportunity to their opponents to take over the playing initiative in a point by playing quick and precise strokes in a high tempo. The mentioned ultimately makes the difference between two groups (match winners and losers).

The results obtained in variables that refer to the initial part of the point, and which relate to serve characteristics (aces, double faults, 1st serve average speed and 2nd serve average speed), indicate that in female competition a fast serve does not create a significant initial advantage at the beginning of the point. The reason for the afore mentioned is very likely in the type of playing surface on which Roland Garros tournaments are played. Clay surfaces decrease the speed of the ball in a higher degree (after the bounce) due to the larger coefficient of friction, so that its bounce off is somewhat higher in comparison to other playing surfaces (Barbaros Tudor et al., 2008; Kaučić, 2015). As a result of the mentioned characteristics of the playing surface, it is possible that serve speed in women's tennis does not represent a significant advantage, as well as that it is not as much of a key factor for winning points. Along with it, no significant difference was found in the aces variable, which can indicate that other serve characteristics, instead of serve ace, could relate to quality of serve (such as good serve placement – ball placement, ball rotation, precision and variability of performing different types of serves) can contribute to winning a point. This can indicate that serve trainings should primarily be directed in the sense of creating a quality stroke that can potentially create an advantage for a better performance quality of the following second stroke, and for gaining advantage and domination in the

middle part of the point. On the other hand, if trainings are used to actively target players' abilities, which shall as a product result in increasing serve speed, this can potentially create a significant advantage between players in terms of serve performance. Previous research in male competition supports the mentioned fact (Benjak et al., 2014; Bertović, 2019), as a significant difference can be noticed in the speed of serve performance between two groups of players (winners and losers). During this research, group of winners performed faster 1st and 2nd serve, however, this difference did not show a statistical significance, and it can be noticed that the opportunity for taking over a more concrete initiative in the point was claimed during its middle part. Likewise, group of winners also demonstrated a lower number of double faults, and even though differences in this variable are not significant, the afore mentioned fact contributes to the statement that players who won perform the serve stroke in a more quality manner and with more self-confidence.

CONCLUSION

This research determined the differences in situational efficiency parameters between two groups of female tennis players who won and lost matches at the Roland Garros 2022 main draw. In this research, efficiency parameters for the middle part of the point demonstrated as most relevant for efficiency in a tennis match. The obtained insight is also confirmed in previous research, according to which group of players who won matches play a more precise game, have a lower number of errors during the match, and at the same time, due to a higher quality of stroke performance, succeed in achieving dominance in a point and in winning more direct points by playing more aggressively. Upon analysis of situational parameters, it can be noticed that differences are found in the number of winners and unforced errors, precisely in parameters that refer to the middle part of the point. The obtained results, according to which group of players who won are more successful in maintaining precision, while at the same time playing more aggressively during the entire match, can be interpreted by using several factors on which efficiency depends, as follows: physical conditioning of players, tactical selection of strokes and psychological readiness throughout the entire match. The mentioned results of this research are a demonstration of statistical parameters that are relevant for competitive efficiency, and that should certainly be analysed in terms of other mentioned factors as well. Overall analysis of results for top-level female tennis players in the world conducted in such a manner can be of assistance for training personnel teams in preparing players for the competitive period on clay surfaces. Tennis trainings before competitions on clay surfaces should be based on a high percentage of drills in which precisely the situational conditions for the middle and final part of the point are initiated. In future research it would be interesting to analyse the differences in parameters of situational efficiency between two groups of female tennis players who won and lost matches played on different surfaces.

REFERENCES

Antúnez, R. M., Hernández, F. J. M., García, J. P. F., Vaíllo, R. R., & Arroyo, J. S. D. (2012). Relationship between motor variability, accuracy, and ball speed in the tennis serve. *Journal of Human Kinetics*, *33*, 45.

Barbaros Tudor, P., Matković, B. R., & Novak, D. (2007). A comparison of tennis players' loads on two different court surfaces. *Hrvatski športskomedicinski vjesnik*, *22*(2), 76–81.

Bertović, D. (2019). *Razlike u parametrima situacijske uspješnosti servisa i vraćanja servisa između igrača pobjednika i poraženih na Australian Openu 2019. godine* (Doctoral dissertation, University of Zagreb. Faculty of Kinesiology).

Benjak, A., Tudor, P. B., & Bilić, Z. Differences in parameters of situational efficiency of service returns between tennis players who won and lost at the 2014 Australian Open. *Editors-in-Chief: Dario Škegro*.

Bower, R., & Cross, R. (2005). String tension effects on tennis ball rebound speed and accuracy during playing conditions. *Journal of Sports Sciences*, *23*(7), 765–771.

Davey, P. R., Thorpe, R. D., & Williams, C. (2002). Fatigue decreases skilled tennis performance. *Journal of Sports Sciences*, *20*(4), 311–318.

Fernandez, J., Mendez-Villanueva, A., & Pluim, B. M. (2006). Intensity of tennis match play. *British Journal of Sports Medicine*, *40*(5), 387–391.

Filipčič, T., Filipčič, A., & Berendijaš, T. (2008). Comparison of game characteristics of male and female tennis players at Roland Garros 2005. *Acta Universitatis Palackianae Olomucensis. Gymnica*, *38*(3).

Girard, O., & Millet, G. P. (2009). Neuromuscular fatigue in racquet sports. *Physical Medicine and Rehabilitation Clinics of North America*, *20*(1), 161–173.

Kaučić, P. (2015). *Specifična izdržljivost u tenisu* (Doctoral dissertation, University of Zagreb. Faculty of Kinesiology. Department of Kinesiology of Sports).

Kovacs, M. S. (2006). Applied physiology of tennis performance. *British Journal of Sports Medicine*, *40*(5), 381–386.

Kovacs, M. S. (2007). Tennis physiology. *Sports Medicine*, *37*(3), 189–198

Terraza-Rebollo, M., & Baiget, E. (2021). Acute and delayed effects of strength training in ball velocity and accuracy in young competition tennis players. *Plos one*, *16*(12), e0260825.

Maquirriain, J., Baglione, R., & Cardey, M. (2016). Male professional tennis players maintain constant serve speed and accuracy over long matches on grass courts. *European Journal of Sport Science*, *16*(7), 845–849.

O'Donoghue, P., & Ingram, B. (2001). A notational analysis of elite tennis strategy. *Journal of Sports Sciences*, *19*(2), 107–115.

Vorel, M. (2016). *Differences in the situational performance parameters of the middle and final part of the point between female tennis players who won and lost at the Australian Open 2016* (Doctoral dissertation, University of Zagreb. Faculty of Kinesiology)