BODY HEIGHT AND CAREER WIN PERCENTAGE IN RELATION TO SERVE AND RETURN GAMES EFFECTIVENESS IN ELITE TENNIS PLAYERS

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- ATP,
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Abstract:
Elite tennis players participate in 20-30 ATP tournaments during one year cycle. There are 4 periods on season in which events are played in succession on hard courts, clay, grass and hard courts again. Among top 50 appear those who are experts on slow courts and others whose preferable surface and play style is fast. Aim of this study is to determine on which type of court surface high serve and return efficacy influence the most sports results.

Study group was selected from ATP 2012 year-end ranking, that is, players who were 1-50 ranked were taken into account. Match indicators on serve and return games, career win percentage and body height were statistically analyzed.

Results revealed that short body height is favored when returning on clay courts. By contrast, on all types of surface the taller a player the more aces served. Moreover, high percentage of serve points and games won shows statistically significant relation with a number of match victories on adequate court surface.

In conclusion, players should focus on return if competing on clay and take advantage of serves if playing on fast courts. Additionally, short players are expected to manage returning on clay much better.

INTRODUCTION

Tennis is the only of most popular sports being played on different surfaces forced by ATP events calendar. Playing on clay courts requires distinct preparation than on moderate and fast courts, that is, on hard and grass. For instance, players moving from clay onto grass must adapt to lower ball bounce, shortened time to react, inability to slide and other quintessential factors. Surface change also apparently impacts playing strategy, strokes quality and diversity. This is the reason for which some athletes are experts on one surface failing to dominate on others. Undoubtedly, good servers, especially males, take advantage on fast courts giving not much time to opponents to return. As the serve is the only stroke which is completely controlled by a server and depends on individual disposition, it is thought to be crucial in tennis. Thus, many scientific and methodological papers may be found on serve accuracy, speed, ball toss, etc. [3,5,11,12,13]. As weather conditions and psycho-physical body abilities are single variety which may distract a server and aptitude to expose potential is the main limitation, coaches try to improve serving skills using well-known and original techniques which are then available worldwide. Gelen et al. [7] presented that '*dynamic and high volume upper extremities plyometric warm-up activities are likely beneficial to serve speed of elite junior tennis players*'. Similar group was the subject of Galloway's experiment [6] and results showed that 'Wingate five-step approach for mental training incorporating

biofeedback" may be effective in improving tennis serve accuracy. As a result of statistical analysis of ATP events and confirming serve importance, Cross and Pollard [4] exposed that in a period of 1991-2009 Grand Slam matches were won by taller players whose serves were of higher velocity and the highest number of aces was acquired at Wimbledon (fast courts). In addition, match-induced fatigue seems not to reduce serve speed and accuracy [10]. Serving strategies for singles [1,8] and doubles [2] are then considered to be improved searching for utmost effectiveness and extraction of serve games advantage. Perhaps, there is a need to conduct research which take into consideration statistical data, involving whole career results that would point value of serve and return indicators out. Knowledge of which of them need to be improved prior to given tournament might be a key factor.

AIM OF THE WORK

Aim of this study is to determine on which type of court surface high serve or return efficacy influences the most sports results and whether body height favors any sort of players.

THE MATERIAL AND THE METHODOLOGY

Study group was created from elite ATP tennis players who were classified Top 50 at the end of year 2012. Mean body height was 187cm ±7 and average body mass reached 80kg ±8. 16% players had left hand to be dominant.

Table 1. Mean values and standard deviation of age, body height (cm), body weight (kg) and years played in ATP circuit of Top 50 ATP players.

	Mean	**SD**
Age	27	3
Height	187	7
Weight	80	8
Pro experience	9	

Data were collected from Association of Tennis Professionals Official Website and Pearson's linear correlation of serve and return match indicators, win percentage and body height was computed at p-value<0,001 level of significance.

RESULTS

Top 50 players and their average career win percentage were analyzed in the study. Table 2 presents mean numbers and standard deviation of career win percentage on clay (orange), hard court (blue) and grass (green). The most matches won were noticed on slow surface (56,54%) as well as lowest diversity in comparison with others but paired difference tests proved no significance. On the contrary, 5 top ATP players reached significantly more wins on all courts when compared with ones placed 6-50.

As marked in figures 1-3 the most coherent group was on hard courts on which variables fluctuate around 40-70 per cent and Top 4 players had win-loss ratio in range of 80%. Clay courts results show dominance of Rafael Nadal, Spain, who won over 93% of all matches in career, and the last figure, 3, is characterized by the highest variety with 2 players failed to advance any round at grass tournament to date.

Table 2. Mean career win percentage and standard deviation of Top 50 ATP players (clay, hard and grass in succession).

Players	$\bar{X}$	SD
Total	56,54	11,60
ATP 1-5	75,86	11,58
ATP 6-50	54,39	9,51

Players	$\bar{X}$	SD
Total	56,12	12,12
ATP 1-5	76,63	7,60
ATP 6-50	53,84	10,26

Players	$\bar{X}$	SD
Total	54,32	18,07
ATP 1-5	79,43	6,06
ATP 6-50	51,53	16,76

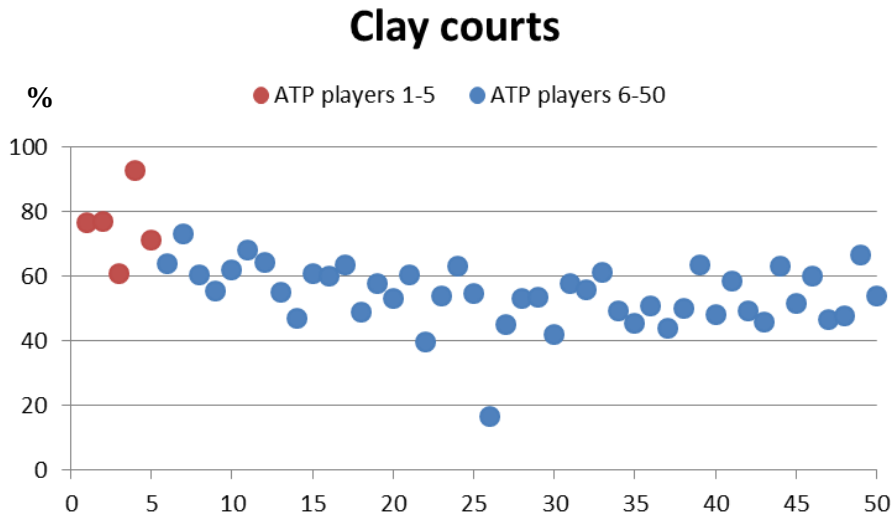

Figure 1. Top 50 ATP players' career win percentage on clay courts.

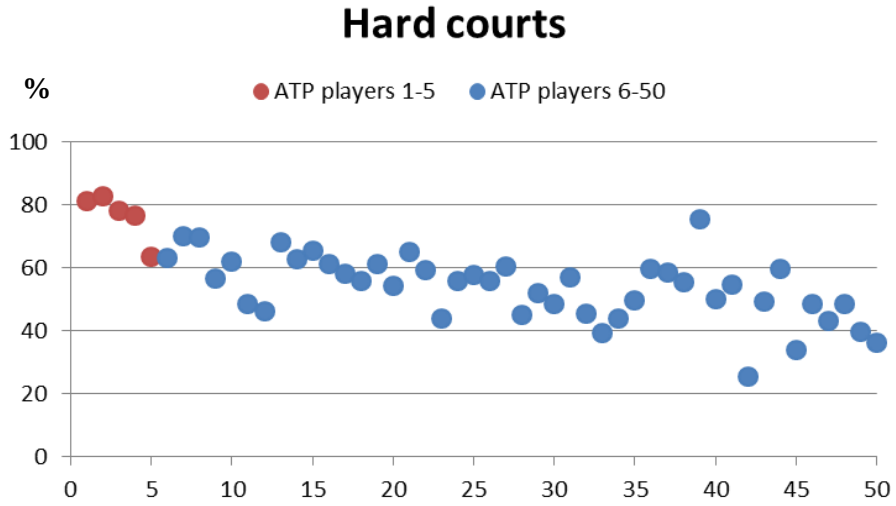

Figure 2. Top 50 ATP players' career win percentage on hard courts.

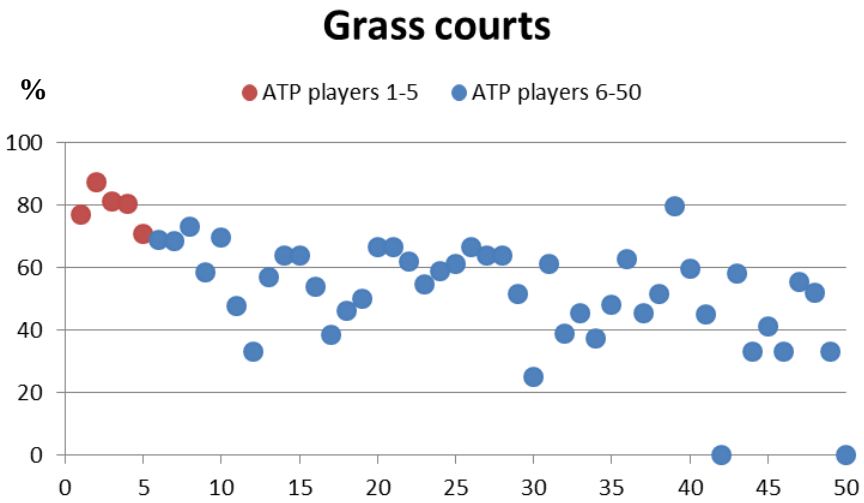

Figure 3. Top 50 ATP players' career win percentage on grass courts.

Table 3 contains values of correlation coefficient between career win percentage and serve game indicators on all types of courts. Adopting p-value<0,001, only number of double faults per match is related to win percentage inversely on hard and grass courts whereas 1st and 2nd serve points won, break points saved, points and games won prove positive correlation. On clay, 2nd serve points won percentage was statistically critical.

Table 3. Correlation coefficient between career win percentage and serve game indicators.

	Aces per match	Double faults per match	1 serve %	1 serve pts won	2 serve pts won	Break points saved	Games won	Pts won
Clay	-0,21	-0,40	0,30	0,01	0,67	0,14	0,40	0,34
Hard	0,35	-0,49	0,25	0,62	0,74	0,68	0,78	0,77
Grass	0,43	-0,54	0,34	0,75	0,82	0,61	0,83	0,84

p<0,001

In table 4, body height influence on serve game indicators was showed. Taller players were noticed to serve more aces per match on all sorts of surface and take more double faults on grass. Important variable on hard courts is 1st serve points won and, on clay, break points saved.

Table 4. Correlation coefficient between body height and serve game indicators.

	Aces per match	Double faults per match	1 serve %	1 srve pts won	2 serve pts won	Break points saved	Games won	Pts won
Clay	0,58	0,11	0,02	0,44	-0,12	0,49	0,35	0,32
Hard	0,59	-0,06	0,12	0,47	0,06	0,32	0,40	0,40
Grass	0,58	0,58	-0,17	-0,01	0,18	0,37	0,22	0,12

p<0,001

Considering return game effectiveness, in table 5, career win percentage and return game indicators were correlated. As shown, all variables are statistically significant ($p<0,001$) for receivers: 1st and 2nd serve points won, break points won, total points and games won. Taking into account other surfaces, on grass, positive correlation was noted in 2nd serve points won.

Table 5. Correlation coefficient between career win percentage and return game indicators.

	1 serve pts won	2 serve pts won	Break points won	Games won	Pts won
Clay	0,76	0,68	0,67	0,76	0,74
Hard	0,39	0,32	0,25	0,43	0,38
Grass	0,22	0,48	0,01	0,44	0,40

$p<0,001$

Body height impact on return play was considered and outcomes presented in table 6 which shown that all variables on slow courts were linked in reverse. 2nd serve points won percentage was important on hard courts as well.

Table 6. Correlation coefficient between body height and return game indicators.

	1 serve pts won	2 serve pts won	Break points won	Games won	Pts won
Clay	-0,55	-0,52	-0,46	-0,52	-0,58
Hard	-0,37	-0,45	-0,19	-0,41	-0,44
Grass	0,28	0,34	-0,19	-0,32	-0,37

$p<0,001$

CONCLUSION

Results of this research reveal several interesting facts on serve and return, depending on the surface players compete on. Body height and its contribution to efficient serving and returning should be clearly presented. Analysis of Top 50 ATP players' career indicators showed that height is a very important factor which favors short athletes competing on clay. It is expressed by negative correlation of body height and all return statistics being generally collected. One reason for the phenomenon might be clay friction decreasing serve speed and enabling the receiver hit the ball back. As short men have center of gravity lowered it is easier to accelerate, change run direction and reach the ball on defense especially if it bounces relatively high. In addition, Pearson's linear correlation between career win percentage on slow courts and the same return indicators was found positive ($p<0,001$). This is expected to assure how crucial it is to master return abilities no matter what type of player. As a part of training might be included server observation what was earlier confirmed to be applied by professionals and have effect [9].

Relating to serve game efficacy and career win percentage it was noticed that on moderate and fast courts, number of point won on 1st and 2nd serve as well as number of serve game points and games won were linked with career win-loss ratio. It might be deduced, players might take advantage when mainly focused on serving at such events and take more risk even on 2nd serve, as it was suggested by Barnett et al. [1] who studied Roddick vs. Nadal bouts.

To sum up, it still remains undecided which type of player, short or tall, is more predestined to play tennis successfully. No matter who coach has to train, authors recommend to underline meaning of serve if fast court event occurs near on schedule and advise solid return practice before slow court tournament. The remarks should be deeply reconsidered and adjusted to player's needs and coach's philosophy.

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