

SHORT REPORT

Test of the Jump Service Spin in Volleyball

Ciro Alminni¹, Tiziana D'Isanto², Francesca D'Elia¹ and Gaetano Altavilla³

¹University of Salerno, Department of Human, Philosophical and Education, Salerno, Italy, ²MIUR Campania, Italy, ³University of Split, Faculty of Kinesiology, Split, Croatia

Abstract

This pilot study aimed to test a procedure to evaluate the improvement of the performance in the short term between incoming and outgoing periods of the volleyball fundamental of the spin jump service by measuring accuracy and differential in the jump. The procedure was performed on a sample of 11 male players (amateur team), aged between 15 and 20 years. Data were collected at the beginning and the end of a four-week intensive training period and included mean and standard deviation of anthropometric data, reach to a hand, Vertec testing, and estimation of the training effect with percentages of improvement. The statistical analysis of the data was conducted with a T-test to verify the difference between the pre and post-workout. The significant difference was set with $p < 0.05$. After four weeks of training, the jump increased by 3.45 cm. In the jump service with a choice of area, the training has produced a precision increase of 16%; while in the jump service in Zone 1, it produced an increase of 16%. Testing the spin service is useful because it enables monitoring performance, designing the training properly, and choosing the most effective training methodology. This test can be a fundamental tool for training and for identifying the best adaptations to be made to the training programme.

Key words: volleyball, jump test, intensive training, performance

Introduction

Several reasons exist for sport testing. The first enables quantifying the athlete's potential, as well as his athletic and technical qualities (Ferrara, Di Tore, & Gaetano, 2018); the second allows setting a correct training methodology (Raiola, 2017) and the third verifying and monitoring the effectiveness of the training and changes in physical condition (D'Isanto, Altavilla, & Raiola, 2017). For both coaches and athletes, it is imperative to periodically monitor the results of training programmes (D'Elia, Mazzeo, & Raiola, 2018). The tests constitute, especially for coaches, a fundamental and highly effective instrument of periodic control; due to the analysis of its results and the received feedback, it is possible to relate the performance with the adopted working strategies (Altavilla, D'Isanto, Di Tore, & Raiola, 2018a) and consequently identify the best adaptations to be made to the training programme being administered to the athletes. The aim of the present study is to analyse and evaluate the jumping ability and technical skills in the fundamental of the

spin jump service in a volleyball team, verifying the effects induced after a four-week training period. The service (Raiola, Altavilla, De Luca, & Di Tore, 2016) in the spin jump is carried out by throwing the ball forward-high inside the baseline so that the player can advance and jump to hit it on the fly with the body fully extended. The spin jump service requires good body control ability and muscle tone, which guarantees the executive safety of the jump; the jump phase and its subsequent landing require strong muscle-articular control capacity, as the impact of relapse has a traumatic value. If an athlete becomes very skilled in feet-to-ground service (Parisi & Raiola, 2014), he can switch to the jumping technique.

Methods

The statistical sample comprises one group of 11 players (under 20) participating in the provincial championship (Mean = 19.2 ± 0.7 years; height: 181.5 ± 5.52 ; weight: 76.0 ± 10.79 ; reach with one hand: 232.2 ± 7.08). These eleven young Italian players have been tested regarding anthropometric aspects,



Correspondence:

C. Alminni

University of Salerno, Department of Human, Philosophical and Education, Via Giovanni Paolo II, 132, 84084, Salerno, Italy

E-mail: c.alminni@studenti.unisa.it

physical ability, and technical ability. The tests were carried out before and after the four-week training period, the players performed specific technical work and adequate warm-ups (Altavilla, Di Tore, & D’Isanto, 2018b) before each training or test. During the four weeks of training, the players performed general and specific strength work to improve their jumping ability and their general physical condition. As far as the technical aspect is concerned, the exercises were carried out to improve service techniques, specifically ball throwing technique, run-up, shot-in-flight management, and ball rotation technique (spin effect). In some phases of technical training, a video camera was used to record the images of the technical gesture to help each athlete notice any errors in the execution. Training hours between pre- and post-testing were comprised of physical training (5h 30m), technique (9h 30m), and phases of game-friendly matches (11h 30m) for a total of 26h 30m. The time dedicated to the training of the float serve (with jump service spin) was 5h 45m.

The following tests were used:

Anthropometric tests: Height (cm); Weight(kg); One-handed reach (cm)

Physical ability tests: Vertec jump test: the athlete makes a run-up and tries to reach as high as possible with the dominant

hand; each athlete makes three jumps, performed after proper recovery. In the end, the average value is calculated, which is taken as the reference value for the test performed. Furthermore, by subtracting the value of the reach to a single hand from the average three jumps, the value of the differential from the ground of the jump is obtained.

Technical ability test: Spin Jump Service: each player must perform 10 jump spin serves (5 to an area of the opponent’s field of his choice, 5 to an area established by the coach or Zone 1).

Measures of central tendency and dispersion (average ± standard deviation) of height, weight and flow rate with one hand were performed on a group of 11 subjects. A t-test was conducted to verify the differences between the pre-post (Vertec Jump and spin Jump service) and the percentages related to improvement. The analysis concerned the basic statistics and the percentages for the considered date.

Results

With the Vertec jump test (Table 1), a difference been detected between two series of jumps (in 11-September and 09-October) between pre and post (3.45 cm), representing an improvement of 16%.

Table 1. Vertec jump test

Player	11 - Sept		09 - Oct		
	Average	Difference Jump	Average	Difference Jump	Diff. Jump Test 2- Test 1
1	291.3	64.3	295.3	68.3	4.0
2	282.0	57.0	282.7	57.7	0.7
3	299.0	61.0	304.7	66.7	5.7
4	297.3	53.3	304.7	60.7	7.3
5	295.7	60.7	299.3	64.3	3.7
6	291.3	60.3	292.0	61.0	0.7
7	291.3	54.3	294.7	57.7	3.3
8	292.7	69.7	298.7	75.7	6.0
9	285.3	54.3	286.0	55.0	0.7
10	293.3	52.3	294.0	53.0	0.7
11	281.3	59.3	286.7	64.7	5.3
Mean	291.0	58.8	294.4	62.2	3.45
Stand. D.	5.57	5.00	6.93	6.26	2.36

A t-test (Table 2) was conducted to check the differences between the two series of jump with the Vertec jump test.

The result is a significant difference with p=0.001 between the two series of jumps.

Table 2. T-test (significant difference with p=0.001 between the two series of jump)

	Average	Std. Dev.	Average Std. error	t	Sign. (with two tails)
VAR01 - VAR02	-3.4818	2.4806	.74794	-4.655	.001

Each athlete performed two series of five spin jump services (11 September and 9 October) to an area of their choice in

the opponent’s field (Table 3). Accuracy increased from 30.9% pre- to 47.24% post-test (an increase of approximately 16%).

Table 3. Spin jump Service, free choice area

Player	11 - Sept		09 - Oct	
	O	X	O	X
1	2	3	2	3
2	3	2	3	2
3	1	4	2	3
4	1	4	2	3

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Player	11 - Sept		09 - Oct	
	O	X	O	X
5	2	3	2	3
6	3	2	3	2
7	1	4	2	3
8	1	4	2	3
9	1	4	3	2
10	1	4	2	3
11	1	4	3	2
Total	17	38	26	29
Positiveness	30.9%		47.27%	

Legend: O-centred goal; X-error

A t-test was conducted to check the differences between the two sets of results at the free choice area. The result is a significant difference with $p=0.005$ between the two sets of results at the free choice area (Table 4).

Table 4. T-test (significant difference with $p=0.005$ between the two sets of results at free choice area)

	Average	Std. Dev.	Average Std. error	t	Sign. (with two tails)
VAR01 - VAR02	-.81818	.75076	.22636	-3.614	.005

Each athlete has two spin jump service series (11 September and 9 October) towards Zone 1 (Table 5) of the opposing field (area chosen by the coach). The accuracy has gone from 60% pre-test to 76.4% post-test (increase of approximately 16%).

Table 5. Spin jump service to Zone 1

Player	11 - Sept		09 - Oct	
	O	X	O	X
1	2	3	3	2
2	3	2	4	1
3	4	1	4	1
4	3	2	4	1
5	2	3	3	2
6	3	2	4	1
7	4	1	4	1
8	3	2	4	1
9	2	3	4	1
10	3	2	4	1
11	4	1	4	1
Total	33	22	42	13
Positiveness	60%		76.4%	

Legend: O-goal; X-error

A t-test was conducted to check the differences between the two sets of results with service to Zone 1 (Table 6). A significant difference with $p=0.001$ between the two sets of results with service to Zone 1.

Table 6. T-test (significant difference with $p=0.001$ between the two sets of results with service to Zone 1)

	Average	Std. Dev.	Average Std. error	t	Sign. (with two tails)
VAR01 - VAR02	-.81818	.60302	.18182	-4.500	.001

Discussion

Through the statistical processing (t-test with $p < 0.05$) of the data, it emerged that following the training sessions carried out in the four weeks between pre- and post-testing, there was an average increase of 3.45 cm in the jump differential at the Vertec jump test (Table 1). The result of the t-test between the two series of jumps in Table 2 ($p=0.001$) was also confirmed. In data processing of the statistics and parametri-

cs (t-test with $p < 0.05$) on the spin jump service towards the area of the opposing field chosen by each individual player, the services that hit the target zone have gone from 17 to 55 to 26 out of 55 with an increase in the accuracy of this specific service by 16% (Table 3). The results of t-test between the two sets of results at free choice area in Table 4 ($p=0.005$) were also confirmed. The services directed towards the area of the opposing field chosen by the coach (Zone 1) went from 33

out of 55 to 42 out of 55 with an estimate of the effect of training on the precision of 16% (Table 5). From the result of the t-test, the two sets of results with service to zone 1 in table 6 ($p=0.001$) were also confirmed.

The research conducted is a pilot study for a small sample size (11 players) and for the shortness of the route between the incoming and outgoing tests (4 weeks). The test is a tool that enables a very effective periodic check and, due to the analysis of its results and the feedback received, it is possible to correlate the performance with the work strategies adopted. Therefore, with this operational strategy, it is possible to identify the best adaptations to be made to the training programme that is given to the athletes. To optimize monitoring and programming, this study is repeated several times during the competitive season (preparation phase - core championship phase - end of the championship) to periodically verify whether there are improvements in physical and technical performance.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

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