

Transition period: Pilot study on performance reduction of ability to jump in volleyball

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ABSTRACT

As previously introduced in the preliminary study (Forte & Altavilla, 2018) we want to estimate the reduction in performance in the transition period, the purpose of this work is to expand the sample of data on the ability to jump. The method is experimental and the study was conducted on the same sample of 22 female athletes divided into two experimental groups, the first composed of athletes aged 12-16 years and the second on athletes aged 18-25 years. In all subjects the following parameters were assessed: height with a stretched arm and height with two extended arms. The elevation and coordination skills were evaluated with the Abalakov test using the technical gesture of the attack and the wall. Other data were obtained by evaluating the results obtained from the difference between the measurement of the attack and the height with an extended arm, and between that of the wall and the height with two extended arms. The test results showed significant reductions in ability to jump after the transition period. **Key words:** Abalakov test; Transition period; Performance; Motor skills.

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INTRODUCTION

Volleyball is classified as an activity with alternating aerobic and anaerobic (Tiziana et al., 2017) engagement with a high percentage of body muscle mass and district demands for high forces. The activity is based on the alternation, more or less regular, random or chosen on the basis of technical-tactical needs and the competitive moment, of submaximum (aerobic), maximum (anaerobic) and rest phases. The limited dimensions of the field determine a performance characterized (Di Tore et al., 2018, D'elia, F et al 2018, Raiola 2017, Raiola, Di Tore, 2017, Di Tore, Gaetano R, 2012) by technical gestures (jumps, attack shots, etc..) at high speeds and intensities and by shots, sometimes starting from very low positions, over distances from 3 to 12 meters.

The players perform between 70 and 150 jumps during the competition, including attack jumps, wall jumps and serve (By Lobietti). In order to completely define the physiological characteristics of a sport, it is necessary to evaluate also the basic functional qualities of the practicing athletes. Therefore, the purpose of this study is to enlarge the sample of data obtained in the preliminary study (Forte, Altavilla 2018) to estimate the reduction in performance (Gaetano A. 2016) after the transition period (Raiola, D'Isanto, 2016). From the beginning of the 2017/2018 season, anthropometric samples have been taken and various types of performance tests have been given to the athletes, following the canons of the scientific study (Raiola et al., 2018, Raiola, 2014, Raiola Di Tore, 2012abc, Raiola, 2012, 2013).

METHODS

Subjects

The survey was carried out on a sample of 22 female volleyball players who have practiced this discipline for at least 5 years of competitive activity and participate in an average of 3 training sessions per week. The age of the players differs significantly from one group to another, respectively in age of development (12-16 years) and not (18-25 years) evaluating: anthropometric measurements (reach to 1 hand-reach to 2 hands) - explosive force of the lower limbs (jump from standing and chase).

For each of the tests, precise criteria for measurement and performance are indicated which, without falling into the trap, must limit the personal interpretations of the technicians (Cirillo et al., 2016).

Elevation test

For this test, a graduated scale in centimetres has been set up on a wall. During the test, the trainer must be in an optimal position at the top near the meter. Gypsum powder was used to help determine the height reached. If the tests are not carried out periodically, it is advisable to have the athletes make some preliminary attempts and mark the ideal line of detachment on the floor.

The anthropometric parameters were initially measured with regard to the maximum point reached with feet on the ground and an arm stretched to the maximum (Height with a stretched arm, HSA1) and two arms stretched to the maximum (Height with two stretched arms, HSA2).

Subsequently, the following tests were carried out:

1. **Spike Jump (SJ):** the athlete with a chase at will but with two-legged detachment tries to touch as high as possible with the dominant hand (unit of measure 1 cm)

2. **Block Jump (BJ)**: standing still under the meter and without counter movement, the height reached is measured - only a small difference between the height reached between the two hands can be tolerated (unit of measurement 1 cm).

They were derived from the data collected also:

- **elevation from standstill (SE)**: difference in cm between the **block jump** and the **reach 2 hands**;
- **elevation with run-up (EWRU)**: difference in cm between the value of the **spike jump** and the **reach 1 hand**.

Each test is characterized by the execution of three jumps: for the statistical survey is considered the best result. In this study the Abalakov test was used to measure and evaluate the elevation in a specific way, using the technical action of the attack to the net and the action of the wall. Each player simulates the attack action with a run-up phase and the wall action starting from a static position. Other data have been obtained by evaluating the results obtained from the difference between the measure of the attack action with a run-up step and the maximum measure reached by extending the dominant arm, and again, between the technical action of the wall from a standstill and the maximum measure reached by completely extending the upper limbs. In this way it is possible to calculate the elevations obtained by the various players by jumping with and without running.

Statistics analysis

Data on the anthropometric characteristics and results of the Abalakov test are presented as average and standard deviation (SD) (D'isanto, T et al ,2018, Altavilla et al 2018, Altavilla et al 2017). The comparison of the anthropometric data and jumping ability was done between two groups of different ages.

RESULTS

Table 1 Anthropometric data Table 2 Anthropometric data

Group A (n=12)	M	DS	Group B (n=10)	M	SD
Age (year)	14,8	3,7	Age (year)	21,6	3,9
Height (cm)	160,1	5,1	Height (cm)	162,2	4,2
Weight (Kg)	57,8	9,1	Weight (Kg)	56,9	4,3
HSA1 (cm)	209,6	7,29	HSA1 (cm)	210,1	6,42
HSA2 (cm)	206,6	6,84	HSA2 (cm)	207,4	6,08

Table 3 Test Spike jump (cm)

Group A			Group B		
	June	September		June	September
1	243	250	1	238	245
2	248	246	2	251	246
3	235	233	3	252	248
4	255	251	4	256	250
5	245	251	5	248	243
6	248	245	6	250	245
7	230	220	7	265	257
8	240	245	8	250	240
9	258	257	9	228	220
10	233	228	10	248	245
11	230	227			
12	245	241			
Average	242,5	241,17	Average	235	233,75
Median	244	245	Median	235	236
max	258	257	max	251	246
min	230	220	min	220	215
sd	9,22	11,54	sd	10,02	10,91

Table 4 Test Block Jump (cm)

Group A			Group B		
	June	September		June	September
1	235	241	1	230	235
2	242	240	2	245	231
3	235	230	3	245	243
4	250	245	4	245	242
5	231	245	5	237	233
6	240	237	6	238	232
7	220	215	7	251	246
8	230	231	8	238	233
9	251	246	9	220	215
10	228	225	10	240	237
11	220	215			
12	238	235			
Average	248,6	243,9	Average	238,9	234,7
Median	250	245	Median	239	234
max	265	257	max	251	246
min	228	220	min	220	215
sd	9,90	9,55	sd	8,82	8,63

Table 5 elevation data (average + SD)**Group A**

June		September	
SE (cm)	28,33 ±8,25	SE (cm)	27,08 ±6,76
EWRU (cm)	32,83 ±6,75	EWRU (cm)	31,50 ±7,32

Gruppo B

June		September	
SE (cm)	31,5 ±5,91	SE (cm)	27,3 ±7,73
EWRU (cm)	38,5 ±6,98	EWRU (cm)	33,8 ±7,86

DISCUSSION

From the statistical analysis of the tests on both group A and group B, we can say that the transition period has led to a reduction in performance in all the capacities analysed. Almost all the girls worsened during the transition period in the strength of the lower limbs. In particular, only in some cases we have seen that group A compared to group B has better values, it should be noted that with regard to the height of the jump and the elevation to the wall are power tests very closely related to the technique of execution, this implies that the two groups are homogeneous from the physical point of view while the difference is found in the technique and coordination skills.

Tables 1 and 2 show the mean and standard deviation of the anthropometric data. In Tables 3 and 4 the results of the Abalakov test show significant variations. A reduction in performance was found in both Spike Jump and Block Jump tests. Table 5 shows the mean values and standard deviation of the elevation from standstill and with run-up.

The specific objective of an athletic training program is to create an athlete, equipped with the muscle and joint groups necessary to withstand the short and medium-term stresses that the practice of volleyball imposes during a sporting career. Before deciding whether to devote and how much time to physical preparation is important to know the characteristics of the players at their maximum performance and at the beginning of the preparation knowing the degree of reduction of performance occurred in the transition period, you must also consider some factors such as: the age of the athletes, the amount of weekly training hours and the organization of the championship. It often happens to find teams where the physical and athletic preparation is entrusted to improvisation, to the limited experiences made by the coach or even is very secondary and poorly considered. The preparation is greatly affected by these shortcomings: are strongly limited the potential of the subjects, prejudiced the sporting maturation of a young man, creating the conditions for consequent possible trauma.

In recent years, the collective awareness of the important role of physical preparation for the activity and development of an athlete has improved considerably; however, in all sports specialties, at a lower competitive level, the contents of this preparation are often lacking. If this way of preparation is contraindicated at all levels, it is even more so at the juvenile level. For young people, preparing in this way can mean compromising their training, limiting their sporting growth. Physical and athletic improvement is achieved by perfecting the motor qualities through the improvement of the overall physical efficiency of the

person. In all sports, in order to achieve the best performance, a close synergy between athletic work and technical work is of fundamental importance, with a physical preparation carried out on a precise scientific basis and a careful planning of the work and verification tools. In this regard, the evaluation tests are to be considered as fundamental tools that allow the adjustments and adaptations of the programming to the responses and emerging issues. Each player or athlete must have a personal card where, starting from the anthropometric data and the physical-sports history, the results of specific evaluation tests of the various physical and motor skills are recorded at the beginning of the work and verified during the preparation. The evaluation tests must be identified and proposed in a very precise way, corresponding to the characteristics of the various sports activities, the subjects, the equipment and the time available.

CONCLUSIONS

Modern volleyball, due to the short duration of the game and the increasing intensity of the rhythm, requires much more anaerobic metabolism alactacid, so we increasingly need fast and powerful athletes. The evaluation, training and continuous monitoring of the jump, in relation to technical and tactical aspects and conditional skills, become an important aspect of performance control. With this work I have collected test data from athletes of developmental and not developmental age, analysing the reduction in performance during the transition period. The collection of these data can lead to the right mix of physical preparation and technical aspect, in increasing the athletic abilities of young athletes and in the girls' learning of a methodology and mentality of physical training similar to the advanced team model.

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