



THE IMPROVEMENT OF THE MUSCULAR CONDITION BY ALTERNATIVE CONTRACTION REGYMES AT JUNIOR VOLLEY BALL PLAYERS I

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Introduction

The muscular training is one of the most important factors and in some cases the most important sportive training ingredient in reaching performance, influencing the way the preparation unfolds all throughout the component stages of the macro-cycle. This must be done in an equilibrated and unitary manner for each of the motrical abilities demanded by the performance volleyball. In order to form the female players, it is necessary to homogenously develop the muscle groups, avoiding any disequilibrium that might alter the ulterior training and sportive performance. The attention must be focused especially on developing the great muscle groups, while the force training must be introduced gradually, at first using the exercises requiring the weight of one's own body, then easy exercises with medicinal balls, weight exercises, and finally exercises specific to the practiced sport, which are to ensure the high level preparation with a view to competitions.

The purpose of the paper is that of improving the muscular exercise inside the training of the female junior players I, adapted to the game tasks, by elaborating and valuing the alternate programs of the contraction régimes, with the possibility of accomplishing an optimal, rationalized training, with a view to reaching the proposed performance objectives.

The research hypothesis: Taking into consideration the determined role of the muscular preparation in defining the physical training at female volley-ball players, we assume that by applying the alternate regimes for the purpose of developing the specific force, we create the premises of a more complex training, if compared with the usual methods normally used by coaches. The investigation methods: the analysis and generalizing of the special field of literature data, the measurement and tests method, the pedagogical experiment, the statistical-mathematical method.

The muscular training tests applied: In order to test the force of the inferior limbs we have used the "Quattro Jump Training" force measurement platform, thus making use of 4 tests:



The Squat jump (SJ) – the test presupposes doing a vertical jump from a semiflexed position, 90° or completely, on the ground, without supplementary push of the ground, with bended arms, palms on hips. The lack of the arms action diminished performance by 10cm, and this is exactly why the results given as reference point are apparently weak, but justified: between 24 cm – 38 cm for females and 26 cm – 45 for males. The SJ performance describes the ability of jumping and



The Quattro Jump tip Kistler 9290AD force measurement platform

the (maximal) explosive force of feet, the neuro-motric capacity, the quick fibre quantity.

The Counter Movement Jump (CMJ) –the test presupposes doing a vertical jump identical to the Squat Jump, but by starting from a standing position. An energetic flexion is executed, followed by the extension and vertical jump. The differences between the two tests represent the „elastic” aptitudes of the sportsmen. The CMJ



performance describes the evaluation of the explosive (maximal) force FV of the legs, and the quality of resusing the muscular elasticity, the capacity of neuro-motric recruiting, the capacity of using the visco-elastic force from the muscular tissue.

The Continuous Jump with Bent legs reference (CJbref) – series of 5 – 7 jumps with bended knees at the contact phase used as reference for cu CJb 15 – 60 seconds. The CJb performance describes the mechanic power of the inferior train.






The Continuous jump with straight legs (CJs) (reactivity test) – series of 5 -10 jumps with stretched knees (short, elastic contact with the ground). The CJs performance describes the evaluation of the muscular elasticity of the legs extension muscles, the jumping technique and tolerance to stretched impact, the quantity of quick fibre.



Organising and unfolding the research:

The experiment took place at the sport gymnasium of the National College Alexandru Dima and at the Physical Education and Sport Faculty, Pitești. The group participating in the experiment was the female junior I volley-ball players, LPS Pitești participating in the National volley-ball championship. The lot is formed of 12 LPS Pitești Sport Club.

The experimental investigations unfolded during the 1st of March 2008 – 15th of June 2008. It began by the application of 4 control trials, after which we elaborated a training schedule, we used during their preparation.

Curriculum model

	SUPERIOR LIMBS		
	ISOMETRIC	PLYOMETRIC	
			
OBJECTIVE	Developing the throw force (hit)		
MUSCULAR ACTION	- deltoid, triceps brachial.	-back muscles, chest muscles, triceps brachial, brachial biceps.	
TECHNICAL DESCRIPTION	<i>From oblic support on the gymnastics bench, with the trunk at 45°, maintained isometrics</i>	<i>Two facing other two; throw of teh medicinal ball (3 kg) with both hands from upwards.</i>	
DOSAGE	10'' isometrics, 21 medicinal ball throws + 10'' isometrics, 21 medicinal ball throws X 3-5 SERIE		
PAUSE	1-2 minutes between series		
VARIANTS	The same exercise with maintained semiflexion of one arm and then of the other.	The same exercise with throw of the medicinal ball of 3kg from jumping. The same exercise with throw of the basketball ball, with two hands, from upwards.	
METHODICAL INDICATIONS	- the elbows are kept near the body; - straight back, the body must not be in extension; - respiration in voluntary apnee at maintained isometrics; - ample respiration movements after finishing the maintained isometrics.	- in launching the ball, the movement is spontaneously plyometric- an excetric phase followed by a concentric phase; - one insists on the posterior plan movement of the ball for muscle stretching; - a forced expiration is executed in the final effort; -before the execution, a complete respiration is effectuated.	

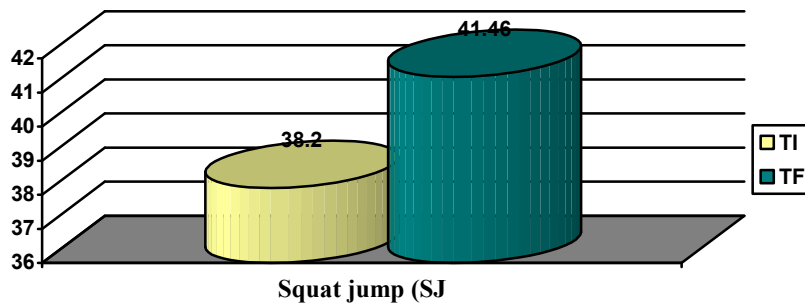
	INFERIOR LIMBS	
	ISOMETRIC	PLYOMETRIC
		
OBJECTIVE	<i>Developing the letting-go force</i>	
MUSCULAR ACTION	- quadriceps, bottom muscles and triceps-sural.	- quadriceps, bottom muscles and triceps sural, calf muscles.
TECHNICAL DESCRIPTION	<i>Maintained in semiflexion, legs bended at 90°.</i>	<i>Two legs jumps left-right over the gymnastics bench.</i>
DOASGE	10'' maintained in semiflexion, 14 jumps over the gymnastics bench + 10'' maintained in semiflexion, 14 jumps over the gymnastics bench X 3-5 SERIES	
PAUSE	1-2 minutes between series	
VARIANTS	The same exercise from semi-flexed on one leg.	The same exercise, jumping from one leg to another over the gymnastics bench.
METHODICAL INDICATIONS	- vertical maintaining the trunk; - legs slightly parted, on the entire sole.	- the breathing movements are executed in individualised rhythm ; - normal inspiration; - normal expiration; - during the jump, the body is maintained in a vertical position, the knees beingbended forward ; - the landing is done on the tip of the toes, with smoothing ; - the jump is executed with the help of the arms.

Analysis and interpretation of the data:

Nr.	NAME	AGE (year)	WEIGHT (kg)	hSJ		hCMJ		hCJs		hCJb	
				TI	TF	TI	TF	TI	TF	TI	TF
1.	UD	17	80	35.8	38.8	43.4	47.6	42.4	46.4	33.7	36.5
2.	CA	18	52,57	38.8	42.5	40.5	44.5	44.3	47.6	24.7	27.5
3.	PD	17	64,83	38.2	41.3	37.1	41.4	36.6	40.4	38.5	42.3
4.	TA	17	50,90	42.1	45.2	41.4	45.3	35	38.6	36.4	40.5
5.	TR	18	58,83	33,3	38.5	35.9	38.6	42.5	45.9	32	36.4
6.	GD	18	72,02	42.4	45.5	42.7	45.6	39.1	43.5	42.9	45.6
7.	MA	17	61,13	34.7	38.4	35	39.3	36.7	40.3	32.4	36.6
8.	IM	18	84,70	36.4	38.9	38.6	42.3	31.7	36.4	33.8	37.8
9.	PA	17	65,28	38.1	42.6	38.2	42.3	41.8	45.4	34.8	38.5
10.	CM	17	46,86	36.3	39.9	37.7	41.3	39.5	43.2	38.2	42.4
11.	PA	17	79,71	44.4	48.5	38.5	39.1	37.4	41.2	37.4	41.3
12.	MA	18	67,5	33.1	37.5	32.8	35.2	31.7	40.3	38.2	42.4
X		17.41	65.36	37,8	41,46	38,46	41,87	38.25	42.43	35.25	38.98
S		0.514	12.131	3,62	4,46	3,13	3.51	4.14	3.44	4.54	4.64
CV		2.95	18.56	9,59	8,35	8.15	8.39	10.84	8.12	12.89	11.95
t					16,464		10,778		10,128		21,063
p					<0,001		<0,001		<0,001		<0,001

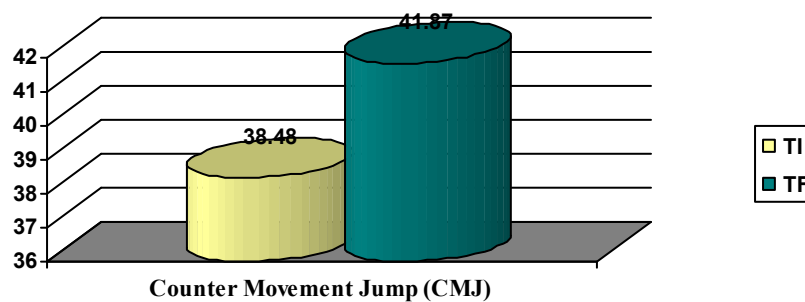
The first trial the team was subjected to, The *Squat jump (SJ)*, shows an improvement of the average from 38.20 cm in the initial testing to 41.46 cm in the final one, while the variability coefficient indicates a homogenous group .

The statistico-mathematical indices at the Squat jump test (SJ), (average)



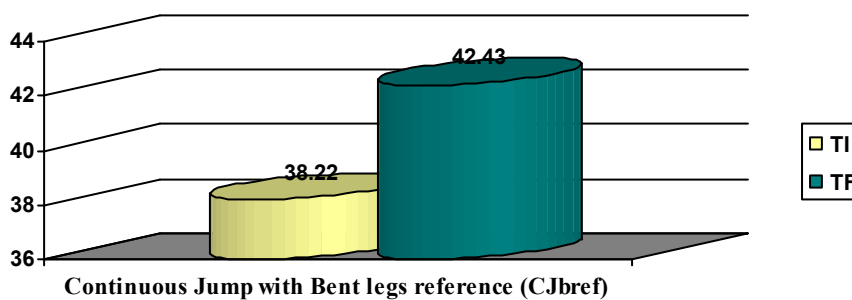
In the *Counter Movement Jump (CMJ) trial*, an average of 38.48 cm was obtained in the initial testing, while the final one showed 41.87 cm, and the variability coefficient is of 8.15% in the initial and respectively of 8.39% in the final test, which shows that this group has a great level of homogeneity.

The statistico-mathematical indices for the Counter Movement Jump test (CMJ) – (average)

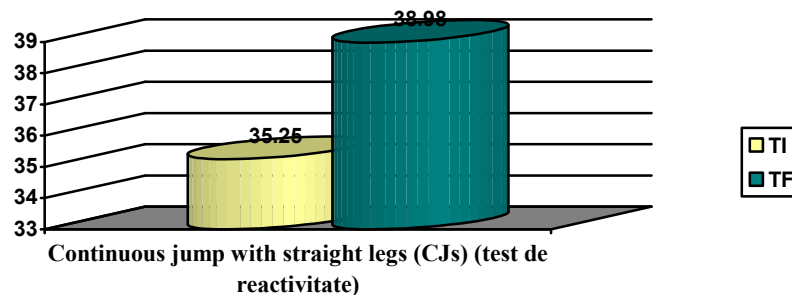


The Continuous Jump with Bent legs reference (CJbref) is the trial where the team obtained an average of 38.22 cm in the initial testing and 42.43 cmin the final trial, while the variability coefficient is of 10.84% at the beginning and respectively of 8.12% in the final trial, which shows us that this lot has a large degree of homogeneity.

The statistico-mathematical indices for the Continuous Jump with Bent legs reference (CJbref) test – (average)



The statistico-mathematical indices for the Continuous jump with straight legs (CJs) test (reactivity test) – (average)



The last trial put to test was the „*Continuous jump with straight legs (CJs) (reactivity test)*”, for which the average improved from 35.25 cm in the initial test to 38.98 cm in the final trial, while the variability coefficient shows a great homogeneity of the tested group, both in the first as in the last trial.

Conclusions:

- Most specialists use well known and generally applied methods inside training, not being familiarised with modern methods of individual preparation in function of the specific of the post, which would lead to benefic results for the performance sport.
- The use of alternate contractions regimes in training leads to the female volleyball players acquiring superior muscle preparation.
- The alternate isometric-plyometric combination represents a valid solution for developing the force specific to the primarily important segments inside the game of volleyball.

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