



ELECTROMYOGRAPHICAL COMPARISON OF VOLLEYBALL PLAYERS ON SELECTED MUSCLES

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ABSTRACT

The present study was undertaken to investigate the significance difference among the national, university and state level Volleyball players while performing jump serve on selected moment i.e. take-off. 30 male volleyball players were selected as a subject and they all belong to Lakshmibai National Institute of Physical Education, & Jiwaji University, Gwalior and there age ranged from 18-24 years. One way analysis of variance was employed to find out the significant difference among the volleyball players. SPSS version 17 was used to perform all statistical technique. The finding reveals that there was a significant difference among National, University and State Level volleyball players at the moment take-off.

KEY WORDS: Volleyball, Electromyography, Comparison.

INTRODUCTION

Athletes prepare to achieve a specific goal through structured and focused training. The intent of training is to increase the athlete's skills and work capacity to optimize athletic performance. Training is undertaken across a long period of time and involves many physiological, psychological, and sociological variables. During this time, training is progressively and individually graded. Throughout training, human physiological and psychological functions are modeled to meet demanding tasks (Bompa et al 2009).

The jump serve is a difficult serve to master, although many players try. The differences between it and an overhand serve are the server tosses the ball higher and with the same hand as he or she is going to hit the ball. The server needs to stand three large steps behind the point of contact as he or she will take those steps as he or she is tossing the ball up in the air, and then will jump up to meet the toss. The key to this serve is a good toss that leads the server. Another key is for the server to be able to time his/her approach to his/her toss (Roque et al 2001).

For the purpose of sighting the EMG difference of Volleyball players on selected muscles during jump serve, the present study is delimited to National, University and state level Volleyball players. For the collection and recording of data electromyography was used during jump serve and Only 3 muscles were analyzed. The study was hypothesized as there would be

significant difference on muscular contraction of National, University and state level Volleyball players.

METHODOLOGY

All the selected players were participated at the Senior National, All India Inter-university and state level and 10 male Volleyball players were selected as subject in each group by help of consecutive sampling with age ranged from 18 to 24 years. All the selected subjects for the present study were from Lakshmbai National Institute of Physical Education and Jiwaji University, Gwalior, Madhya Pradesh. On the basis of review of literature, expert opinion in the field of Volleyball only 3 muscles were examined as shown in the table 1.

Table 1
List of selected muscles

	Muscle Name	Both Leg
1	Rectus Femoris (RF)	RFR & RFL (right and left)
2	Vastus Lateralis (VL)	VLR & VLL (right and left)
3	Vastus Medialis (VM)	VMR & VML (right and left)

The data for the selected muscles were obtained with the help of the instrument operated by the investigator at the moment take-off of Jump Serve. Anatomical landmarks of selected muscles were marked by palpation method for identification and location of selected muscles for electrode application. Muscles activities during Jump Serve were measured by Bio Tech Thought Technology of six channels in micro volt (μV). The testing protocol was adopted at the time of testing the subject.

One way ANOVA was applied to compare the muscular contraction among National, University and State level Volleyball players and LSD post-hoc test was employed to compare significance of mean difference for the variable on which significance variance was observed.

DISCUSSION

Table 2
Analysis of Variance of Selected Muscle among Different level of Volleyball Players
During Take-Off

Muscle	Source of variance	Sum of square	df	Mean Square	F-value
RFR	Between Group	264892.28	2	132448.142	243.77*
	Within Group	14669.80	27	543.326	
	Total	279562.08	29		
RFL	Between Group	198407.584	2	99203.79	94.72*
	Within Group	28279.126	27	1047.375	
	Total	226686.710	29		
VLR	Between Group	119462.42	2	59731.21	90.94*
	Within Group	17733.52	27	656.797	
	Total	137195.94	29		
VLL	Between Group	10341.93	2	5070.96	55.50*
	Within Group	2515.42	27	93.16	

	Total	12857.35	29		
VMR	Between Group	178032.67	2	89016.34	38.33*
	Within Group	62697.24	27	2322.12	
	Total	240729.91	29		
VML	Between Group	236735.93	2	118367.96	95.38*
	Within Group	33507.06	27	1241.00	
	Total	270242.99	29		

* Significant at 0.05 level

Tab. $F_{.05}(2, 27) = 3.35$

It was evident from table-2 that, there were significant difference in muscular contraction of RFR, RFL, VLR, VLL, VMR & VML muscle of different group of Volleyball players i.e. National, University and State as the obtained 'F' value was greater than tabulated F-value (3.35) required to be significant. Since f-value was significant so LSD Post Hoc Mean test was employed and the finding pertaining to this has been presented in table-3.

Table 3
LSD post Hoc test of mean comparison among different level of volleyball players

Muscle	National	University	State	MD	CD
RFR	638.00	623.30		14.69*	10.42
		623.30	431.72	191.58*	
	638.00		431.72	206.27*	
RFL	639.30	590.67		48.68*	14.47
		590.67	447.69	142.98*	
	639.30		447.69	191.61*	
VLR	563.16	542.52		20.63*	11.46
		542.52	420.17	122.35*	
	563.16		420.17	142.98*	
VLL	136.81	118.16		18.65*	4.32
		118.16	91.56	26.60*	
	136.81		91.56	45.25*	
VMR	580.05	572.98		7.07	21.55
		572.98	413.21	159.77*	
	580.05		413.21	166.84*	
VML	599.42	599.92		.50	15.75
		599.92	411.22	188.69*	
	599.42		411.22	188.19*	

*Significant at 0.05 level

Above statistical findings clearly implies that muscular contraction of RFR, RFL, VLR, VLL, VMR & VML muscle among National, University and State Volleyball players were significantly different except VMR and VML muscles were more or less similar for National and University Level Volleyball Players. However, there was a significant difference among National – State

and University – State Level players at the moment take-off. The hypothesis stated earlier that there would be significant differences of muscular contraction among National, University and State Level Volleyball Players was accepted.

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