
Research Paper



**RELATIONSHIP OF SELECTED MUSCULAR CONTRACTION WITH THE JUMP
SERVE PERFORMANCE OF VOLLEYBALL PLAYERS**

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ABSTRACT:

The present study was undertaken to find out the relationship of muscular contraction of national and university level Volleyball players with jump serve performance on selected moment hitting. The population for the present study was twenty male Volleyball players of Lakshmbai National Institute of Physical Education, & Jiwaji University, Gwalior ranging within the age group of 18-24 years. The Spearman's Rank correlation (ρ) was used for analysis of the data by the help of SPSS version 17. Finding reveals the significant relationship between national and university Volleyball players on selected muscles.

KEYWORDS: *Volleyball, Muscular Contraction, Jump Serve Performance.*

INTRODUCTION:

The human body having evolved to its present form through a multitude of accidents or change mutations, may be unique with respect to its anatomy and physiology, but the same laws and principles which govern all other animate and inanimate objects in the universe are also applicable to it. All motor skills performed with an implement (bat or racket) or without, are influenced in varying degree by one or, in more instances, a number of these physical laws and principles (Ajmer Singh 2006).

Volleyball matches are played on the basis of best of five sets and each set is played to 25 points with a two-point advantage to win the set. Highlights of the game include the powerful spikes and blocks performed by players at the net. There is also an exchange of tactics at the net, and each team has a unique strategy based on their players' skills and playing style. But in recent times, offensive action has become faster while team tactics are starting to vary. Powerful jump serves send the ball speeding over the net, while players who are more than 2m tall can reach heights of up to 3.5m when smashing the ball into the opposing team's court. You may also see players diving full-length to retrieve a ball moments before it hits the floor.

Researcher conceptualized the study to inspect the relationship of selected muscular contraction with jump serve performance of Volleyball players. Only 20 male Volleyball players were selected as a subject for the study and were further sub-categorized in two groups viz. National and University. The electromyographical instrument was used for recording the muscular activity during jump serve on selected moment of execution (Hitting). The following muscles i.e. Rectus Femoris (RF), Vastus Lateralis (VL), Vastus Medialis (VM), Gastrocnemius (GCM), Anterior Deltoid (AD),

Medial Deltoid (MD), Triceps Brachii (TB), Gluteus Maximus (GM) were analyzed in this study and the common-mode rejection ratio was 110 dB at 50-60 Hz. And it was hypothesized that there would be significant relationship of muscular contraction of selected muscles with the Jump Serve performance of Volleyball players.

METHODOLOGY

Anatomical landmarks of selected muscles were marked for placement of the electrodes. Bio Tech Thought Technology of six channels was used for measuring the Muscles activities in micro volt (μv) and 5 point scale through subjective judgment of three qualified judges was adopted for measuring the Jump Serve performance. Out of three trials, the subject's best was recorded. They were instructed to wear appropriate clothes. The standard EMG testing protocol sequence was adopted for collection of data.



Fig. 1 : Electromyography Instrument



Fig. 2: Hitting phase

Spearman's Rank correlation was employed for investigating the relationship of selected muscular contraction with jump serve performance of national and university level Volleyball players and to conduct all statistical analysis the SPSS version 17 was used.

RESULTS

Table 1

Relationships of selected muscular contraction with jump serve performance of Volleyball players

muscles	Coefficient of Rank Correlation (p)	
	National player	University player
RFR	.206	.313
RFL	.188	.367
VLR	.225	.256
VLL	.469	.469
VMR	.219	.400
VML	.219	.231
GCMR	.300	.707*
GCML	.688*	.682*
ADR	.707*	.794*
ADL	.331	.269
MDR	.744*	.663*
MDL	.269	.419

RELATIONSHIP OF SELECTED MUSCULAR CONTRACTION WITH THE JUMP SERVE PERFORMANCE OF VOLLEYBALL PLAYERS

TBR	.744*	.675*
TBL	.219	.539
GMR	.356	.156
GML	.388	.394

*Significant at 0.05 level.

Tab. $\rho_{.05} (8) = 0.643$

It was evident from the table-1 that co-efficient of rank correlation at Gastrocnimius left, Anterior Deltoid right, Medial Deltoid right, and Triceps Brachii right muscles with the National Volleyball player's performance of Jump Serve at the moment hitting were .688, .707, .744 and .744 respectively, significant with 8 degree of freedom.

It reveals that there were significant relationships of muscular contraction of Gastrocnimius left, Anterior Deltoid right, Medial Deltoid right, and Triceps Brachii right muscles with the National Volleyball player's performance of Jump Serve at selected moment i.e. hitting.

It was evident by table-1 that co-efficient of rank correlation at Gastrocnimius right, Gastrocnimius left, Anterior Deltoid right, Medial Deltoid right, and Triceps Brachii right muscles with the University Volleyball player's performance of Jump Serve at the moment hitting were .707, .682, .794, .663 and .675 respectively, which were significant at 0.05 level of significant with 8 degree of freedom. It indicates that there was significant relationship of muscular contraction of Gastrocnimius right, Gastrocnimius left, Anterior Deltoid right, Medial Deltoid right, and Triceps Brachii right muscles with the University Volleyball player's performance of Jump Serve at the moment hitting.

DISCUSSION

As in depth understanding of various muscular activities is crucially very significant for training and performance improvement in Volleyball and also very essential to study the electrical activities of specific muscles and for this purpose Electromyographical analysis play a key role in identifying the electrical activity and rate of involvement during sports moment.

The statistical findings showed that there was significant relationship of muscular contraction of Gastrocnemius Left, Anterior Deltoid Right, Medial Deltoid Right and Triceps Brachii Right with the performance of Jump Serve at moment hitting of National Volleyball Players. The findings also revealed that there was significant relationship of muscular contraction of Gastrocnemius Right, Gastrocnemius Left, Anterior Deltoid Right, Medial Deltoid Right and Triceps Brachii Right muscles with the University Volleyball Players performance of Jump Serve at the moment hitting.

Selected muscles namely Gastrocnemius Right, Gastrocnemius Left, Anterior Deltoid Right, Medial Deltoid Right, and Triceps Brachii Right revealed the fact that above said muscles have causative role in Jump Serve at the moment hitting or execution phase.

The present study supported the finding of the study conducted by Walls who suggested the muscles involved at the moment hitting of Jump Serve. Present study supported the finding of the study conducted by Cisar et al who presented the major muscles used in (hitting) attack phase of spike and the involved muscles. On the basis of findings the hypothesis stated earlier was partially accepted and partially rejected.

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