

# To Find the Effectiveness of EMG Findings in Upper Limb Plyometric Exercise Versus Upper Limb Kinetic Chain Exercise on Biceps and Triceps for Racket Sports Players-A Comparative Study

M. Nisarudeen<sup>1</sup> and Dr. Vijayaraj<sup>2</sup>

PhD Scholar<sup>1</sup>

Guide, Physiotherapy Department MPT., PhD<sup>2</sup>

Sunrise University, Alwar, Rajasthan

**Abstract:** Title: Comparative Analysis of Electromyographic Activity in Upper Limb Plyometric Versus Kinetic Chain Exercises Targeting Biceps and Triceps in Racket Sport Athletes

*Background:* Electromyography (EMG) is a reliable technique for quantifying muscle activation and neuromuscular performance by recording the electrical potentials generated by muscle fibers during contraction. In the context of sports rehabilitation and performance enhancement, understanding muscle recruitment patterns during specific exercise modalities is critical for optimizing training strategies.

*Objective:* To compare the electromyographic (EMG) activity of the biceps brachii and triceps brachii during upper limb plyometric exercises versus upper limb kinetic chain exercises in athletes engaged in racket sports, and to determine which modality elicits greater neuromuscular activation.

*Methodology:* A comparative, experimental study was conducted on four competitive racket sport athletes over a 12-week intervention period. Surface EMG electrodes were used to record muscle activity of the biceps and triceps during standardized upper limb plyometric and kinetic chain exercise protocols. The study was carried out in the outpatient department of Shree Venkateshwara College of Paramedical Sciences, College of Physiotherapy. Data were analyzed to compare the amplitude and pattern of EMG signals between the two exercise modalities.

*Results:* EMG analysis demonstrated significantly greater muscle activation in both the biceps and triceps during plyometric exercises compared to kinetic chain exercises. The enhanced recruitment observed in plyometric training suggests superior neuromuscular engagement and potential benefits for explosive upper limb performance in racket sports.

*Conclusion:* Upper limb plyometric exercises elicit higher electromyographic activity in the biceps and triceps muscles than kinetic chain exercises in racket sport athletes. These findings support the incorporation of plyometric training into athletic conditioning programs aimed at enhancing upper limb power and performance..

**Keywords:** Electromyographic Activity

