

## عنوان مقاله:

Comparison of the EMG Frequency Spectrum of Lower Limb Muscles during Weight Training with Traditional and Novel Equipment

## محل انتشار:

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## خلاصه مقاله:

Many practitioners and trainers advise designing and executing resistance training programs that include free weights and machines for strength training. The aim of the present study was to compare the frequency spectrum of lower limb muscles during weight training with traditional and novel equipment. Fourteen healthy power lifters (age:  $26 \pm 7$  years) were participated in this study. A portable EMG system with six pairs of bipolar surface electrodes was used to record the electrical activity of the selected lower limb muscles at a sampling frequency of 1200 Hz. Participants had enough experience to perform Free Weights Squat, Smith Machine Squat, Smith Machine Squat with one leg and the Dead lift movements. Participants carried out each movement, 5 times at an intensity equal to 50% of one-repetition-maximum level. The results showed higher median frequency of the vastus lateralis muscle during free weight single-leg squat than those that in the free weight squat ( $p=0.001$ ) and dead lift ( $p=0.000$ ) movements in lifting phase. Also, the median frequency of vastus lateralis muscle in single-limb squat with smith machine was significantly higher than that in the dead lift movement ( $p=0.021$ ). The median frequency spectrum of the gastrocnemius muscle in the free weight squat movement showed a significant increase during the downward phase relative to the free weight single-leg squat movement ( $p=0.039$ ). In order to strengthen vastus lateralis muscle in athletes or individuals with weak vastus lateralis muscle, free weight single-leg squat movement is more effective than those that in the other movements

## کلمات کلیدی:

Keywords: Frequency spectrum, Lower limb, Squat, Smith machine, Dead lift

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