



## **Relationship between electromyostimulation and free weight exercises in multiple repetition maximum strength test**

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### **Abstract**

Background: Electromyostimulation (EMS) is a training that uses electrical current to stimulate muscle contraction. The progression of EMS training is similar with principles of resistance training which are based on the parameters such as pulse frequency, electrical pulse, duration of rest, duration of contraction, the number of repetitions and the intensity (Hz) used. Rate perceived exertion (RPE) scale was used in monitoring the loading along the duration of EMS training while the percentage of repetition maximum (%RM) is globally use in monitoring loading of resistance training (RT). Since the unit of measurement for loading is different, therefore this study seek to find the relationship between multiple repetition maximum electrical pulses in EMS (miliAmpere-mA) and multiple repetition maximum lift (Kilogram-Kg) in free weight strength test. Methods: A total of 10 recreational athlete (age:  $22\pm 0.77$ , height:  $155.6\pm 0.92$ , weight:  $51.6\pm 1.02$ , %BF:  $21.3\pm 1.10$ ) volunteered to participate in strength testing. Participants go through the adaptation of EMS and weight training. Multiple RM (1, 3, 5, 7, 9) was used to measure chest press and squat strength using National Strength Conditioning Association procedure. Data from the tests were analysed using Pearson Correlation. Results: There is significant positive strong relationship  $p < .01$  between EMS and load lift for chest press (1RM;  $r = .96$ , 3RM;  $r = .86$ , 5RM;  $r = .91$ , 7RM;  $r = .93$ , 9RM;  $r = .94$ ) and squat (1RM;  $r = .83$ , 3RM;  $r = .88$ , 5RM;  $r = .93$ , 7RM;  $r = .92$ , 9RM;  $r = .81$ ). Discussion: The results indicate that both measurements were highly correlated between mA and Kg along the nine repetitions maximum strength test. Furthermore, it showed that both measurements can be applied in training to increase muscular strength.