Contralateral strength gains following a 4-week progressive resistance exercise programme

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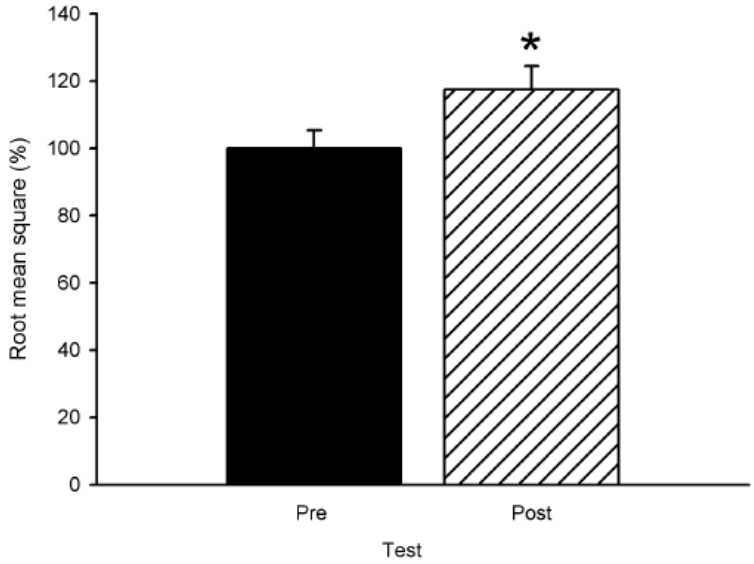
A recent meta-analysis observed a 7.8% pooled estimate increase on the maximal voluntary strength of the contralateral limb following unilateral training. Thirty untrained male subjects completed 4 weeks of resisted single dominant limb exercise progressively increasing in load 10% weekly commencing at 50% of 1 repetition maximum (1RM). Subjects were positioned supine and performed single limb dynamic contractions through 60°-160° of elbow flexion of the dominant limb. Strength was assessed isometrically *via* maximal voluntary contraction (MVC) at 90° and dynamically to determine 1RM. Surface electrodes (Ag/AgCL) recording electromyographic activity at the biceps brachii was low- (500Hz) and high- (10Hz) pass filtered (Digitimer, Neurolog NL144, NL135). Peak and average EMG was calculated from Root Mean Square (RMS) (spike 2 Ver5.13) over 250 ms windows with a 50% overlap. Data are presented as mean ± SEM (* denotes significant difference).

Test	Pre test	Post test	Change (%)
Trained limb 1RM (kg)	17.2 ±0.7	20.2 ±0.7	17.5 *
Contralateral 1RM (kg)	18.0 ±6.8	19.5 ±7.4	8.5 *
Trained limb MVC (Nm)	81.6 ±4.1	89.1 ±4.2	9.2 *
Contralateral MVC (Nm)	83.8 ±3.5	87.7 ±4.3	4.7



A significant increase in dynamic 1RM strength was observed in trained and contralateral limbs after training. A significant increase in exercise limb MVC and non-significant increase in contralateral limb MVC were observed (Table). Mean RMS significantly increased (p = 0.019) 13.7% during trained limb 1RM. Peak RMS significantly increased (p = 0.008) 15.9% during contralateral 1RM (figure). No significant differences were observed in isometric MVC EMG of the trained and contralateral limbs. Increased RMS and 1RM after resistance training suggests strength adaptations were achieved via neural mechanisms specific to the training mode.