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Letter-to-editor

Does the Shake Weight® live up to its hype?

Dear Editor-in-Chief

Muscular strength is an important component of physical fitness and can be improved by using free weights (i.e. barbells, dumbbells), weight machines, elastic bands, or body weight exercises (Stone et al., 2000). A new product in the exercise marketplace which is advertised to increase strength is the Shake Weight®. The Shake Weight® is a dumbbell shaped fitness device, sold by Fitness IQ (Vista, California). There is a 2.5 lb (1.13 kg) version for women and a 5 lb (2.27 kg) version for men. While gripping the Shake Weight® with one or both hands, users vigorously shake the weight back and forth. Springs on both ends allow the weight to move back and forth, creating a resistance which the manufacturer calls "dynamic inertia". The Shake Weight® claims to build definition, size, and strength in less time than traditional weights, with the muscle purportedly contracting up to 240 times per minute (www.shakeweight.com). The purpose of this study was to determine the degree of muscle activation when using the Shake Weight® compared to traditional dumbbell exercises.

Sixteen apparently healthy volunteers (8M: 21.9 ± 3.0 years, 1.82 ± 0.06 m, 90.2 ± 13.7 kg; 8F: 22.0 ± 1.7 years, 1.67 ± 0.03 m, 62.6 ± 7.5 kg) completed two exercise trials, one with the Shake Weight®, the other with an equal weight dumbbell. Females used the 2.5 lb (1.13 kg) Shake Weight® and a 2.5 lb (1.13 kg) dumbbell; males the 5 lb (2.27 kg) Shake Weight® and a 5 lb (2.27 kg) dumbbell. The Shake Weight® trial consisted of four exercises: one-handed biceps shake, two-handed triceps shake, one-handed shoulder shake, and two-handed chest shake. The following dumbbell exercises were used for comparison: biceps curl, triceps extension, shoulder press, and chest fly. During each exercise surface electromyography (EMG) was measured from the biceps brachii, triceps brachii, middle deltoid, and pectoralis major, on the right side of the body. The average EMG for each exercise trial, for each muscle, was "normalized" by dividing by the maximal EMG value recorded during a previously recorded MVIC trial. The averaged EMG from each exercise trial was represented as a percentage of MVIC for each specific muscle.

The % MVIC values during the four Shake Weight® exercises versus the dumbbell exercises are illustrated in Figures 1 through 4, respectively. EMG was higher for all of the muscles tested during the Shake Weight® compared to the dumbbell exercises. However, when comparing specific muscles for each exercise, the Shake Weight® did not always result in significantly greater EMG values for the targeted muscle. For example, for the biceps exercises, the muscle activity of the biceps brachii was not significantly greater during the biceps shake compared to the biceps curl; the middle deltoid was not significantly more active during the shoulder shake compared to the shoulder press; the pectoralis major was not significantly more active during the chest shake compared to the chest fly.

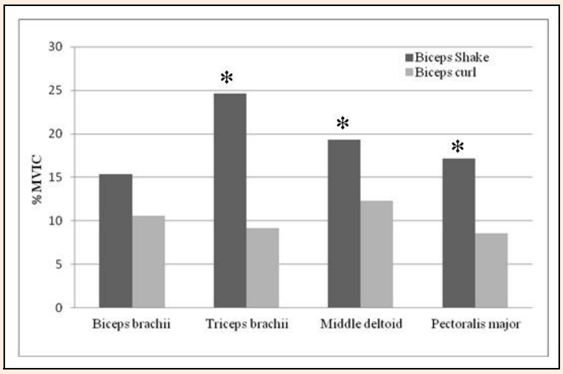

Figure 1. Averaged muscle activity of the biceps brachii, triceps brachii, middle deltoid, and pectoralis major for the biceps shake compared to the biceps curl. *Significantly different than biceps curl exercise ($p < .05$)

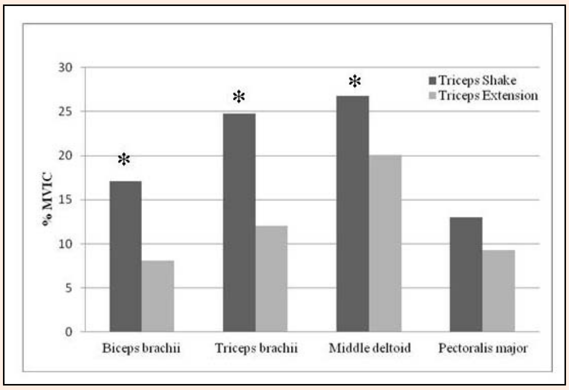

Figure 2. Averaged muscle activity of the biceps brachii, triceps brachii, middle deltoid, and pectoralis major for the triceps shake compared to the triceps extension. * Significantly different than triceps extension exercise ($p < .05$)

Another intriguing observation was that when using the Shake Weight®, the triceps brachii appears to be as active, if not more active, than the targeted muscle for most exercises. For example, during the biceps shake, the triceps brachii was the muscle with the highest EMG, even though the biceps shake is supposed to target the biceps brachii. Similarly, when performing the chest shake, the triceps brachii had the highest EMG levels of the muscles tested. Thus, for all exercises it appears that a strong co-contraction of the triceps is necessary to control the motion of the Shake Weight®. This consistently high level of activation of the triceps brachii appears to be the

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factor driving the higher overall EMG activity with the Shake Weight®.

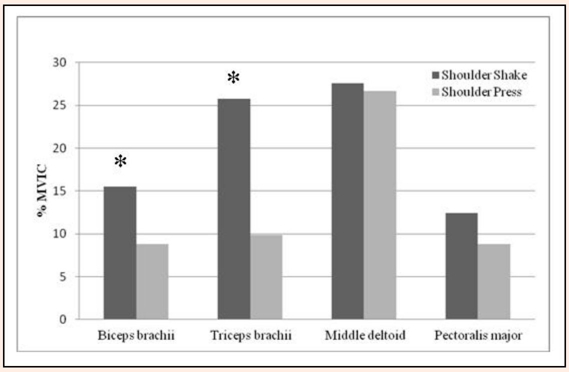

Figure 3. Averaged muscle activity of the biceps brachii, triceps brachii, middle deltoid, and pectoralis major for the shoulder shake compared to the shoulder press. *Significantly different than shoulder press exercise (p <. 05)

While the results of the above analysis would indicate that using the Shake Weight® is superior to using either a 2.5 lb (1.13 kg) or 5 lb (2.27 kg) dumbbell, it is unrealistic to assume that individuals are going to lift weights this low when they workout. A traditional weightlifting regimen typically incorporates weights well beyond 2.5 lbs (1.13 kgs) for women and 5 lbs (2.27 kgs) for men. Accordingly, we conducted a secondary study to determine the relative EMG of the Shake Weight® as a percentage of an individual's one repetition maximum (1-RM). We tested five female subjects, comparing the biceps shake to the biceps curl. Using regression analysis, we determined what percentage of 1-RM that the subjects would need to lift in order to elicit an equivalent level of EMG activity to the Shake Weight®. During the biceps shake using the Shake Weight®, EMG values corresponded to 48% of 1-RM during dumbbell curls. Since the average 1-RM for the five subjects was 20.5 lbs (9.3 kgs), 48% of 1-RM corresponded to approximately 10 lbs (4.54 kgs), which is a much more realistic weight to use for training purposes in women at this performance level.

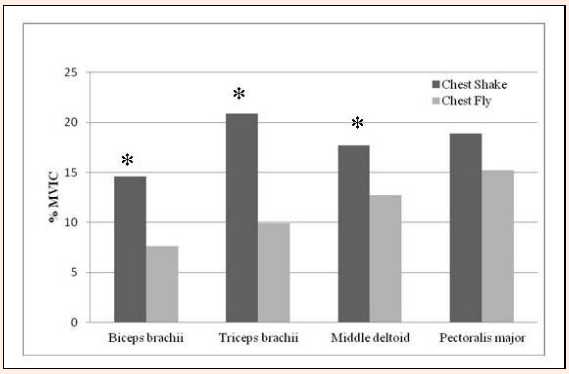

Figure 4. Averaged muscle activity of the biceps brachii, triceps brachii, middle deltoid, and pectoralis major for the chest shake compared to the chest fly. *Significantly different than chest fly exercise (p < .05)

Based on the results of the study, it would appear that using the Shake Weight® activates the muscles of the upper body to a greater degree than using a 2.5 lb (1.13 kg) dumbbell for women or a 5 lb (2.27 kg) dumbbell for men. However, the Shake Weight® movement appears more similar to isometric contractions of the involved muscles, as opposed to the alternating concentric and eccentric muscle contractions used with isotonic free weight training. Additionally, there is large activation of the triceps brachii in all exercises. Thus, functional strength benefits beyond the specific training range of each Shake Weight® exercise could be questioned (Gardner, 1963; Graves et al., 1989). Future studies may want to document comparative changes in strength and body composition consequent to training with a Shake Weight®, in versus traditional isotonic training regimes.

John Porcari ✉, Jennah Hackbarth, Thomas Kernozek, Scott Doberstein and Carl Foster
University of Wisconsin – La Crosse, USA

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✉ **John Porcari**
University of Wisconsin – La Crosse, USA
E-mail: porcari.john@uwlax.edu

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