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The Effect of 4 Weeks of "Fat Gripz" on Grip Strength in Male Collegiate Athletes

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Abstract

Resistance training is one of the most important aspects for athletic improvement in every level of athlete. With respect to resistance training, there has been much controversy regarding the effectiveness of different training techniques. Collegiate athletes often have limited time for resistance training. To be successful, athletic programs must maximize effectiveness with the short amount of time available. This study aims to compare the effects of four weeks of pull-up training using Fat Gripz vs. standard Olympic bar training in male colligate athletes. Fat Gripz are removable rubberized bar attachments that increase the standard Olympic bar to over double its thickness. The purpose of this study is to determine whether forearm grip strength and/or upper-body functional strength will differ with training between groups. Each group will perform three sets of pull-ups, three times a week, for four weeks. Each set of pull-ups will be completed to failure with a two minute rest between sets. For both pre and post training measurements, a hand dynamometer will be used to measure grip strength and a one rep-max lat pull down will be used to assess upper body functional strength. We hypothesize that there will be a greater increase in both forearm grip strength and one rep-max lat pull down in the Fat Gripz group compared to the standard group. If the results show greater strength gains for the Fat Gripz group then this training can be recommended to improve performance in athletes.

Introduction

- FAT Gripz are easy-to-use bar attachments that act as a convenient and cost-effective way to replicate the previously-studied benefits of thick-bar weight-training (1,3,4).
- Attaching Fat Gripz to the standard 1" Olympic bar will more than double its thickness to 2.25".
- Morse et al.(2) reported that male and female subjects generated the most force during pulling exercises closest to a neutral grip angle (between flexion and extension).
- Blackwell et al. (1) reported that grip diameter directly affects grip strength. The bar with the widest diameter produced the lowest grip force.
- Using the widest bar will cause more stress on weak forearm muscles and will increase force over time.
- Ratamess et al. (3) found that there was an inverse linear correlation between increased bar diameter and pulling strength.
- Rossi et al. (4) reported that using a thicker bar during gripping exercises causes the thumb to generate greater force.
- Studies have consistently shown that improved forearm grip strength may also be positively correlated with enhanced health and performance improvements in activities of daily living (ADL's).
- We hypothesized that using Fat Gripz in a pull-up training program would increase grip strength and improve upper-body functionality of associated pulling muscles.

Purpose:

This study aims to compare the effects of four weeks of pull-up training using Fat Gripz vs. using a standard Olympic bar in male colligate athletes.

Methods

Subject Selection:
14 subjects (18-22 yr) were recruited from the Hope College men's soccer club.

Experimental Tests:
Maximum Grip Strength
1 Rep Max Lat Pull-Down

Pre-Test	Fat-Gripz	Post-Test
	Control	

Experimental Design: I-- 4 weeks --I

- Pre-test: 3 maximal grip strength measures with each hand
- Grip strength was measured using a hand dynamometer
- The average of three scores was recorded
- 1-RM lat pull-down was measured
- Participants were matched for maximal grip strength and divided into 2 groups.
- Both groups did 3 sets of pull-ups to failure three times per week for 4 weeks
- After 4 weeks of training, participants were post-tested for maximal grip strength and 1RM lat pull-down
- Over the course of the study, 4 participants were excluded, leaving 10 participants
- A 2x2 repeated measure ANOVA was used to analyze the data between groups over time for maximal grip strength and 1RM lat pull-down

Results

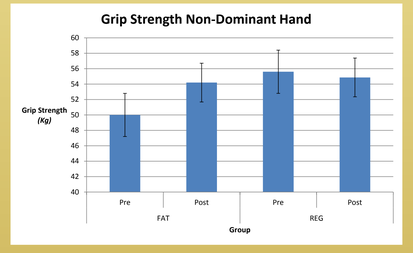

Figure 1. Pre and post non-dominant hand grip strength p= .129

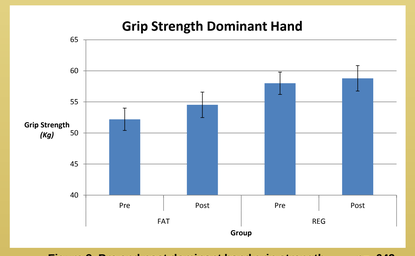

Figure 2. Pre and post dominant hand grip strength p= .642

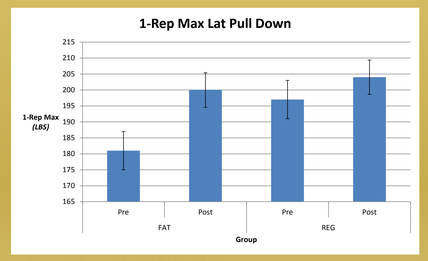

Figure 3. Pre and Post 1-RM Lat Pull
Main Effect for Time p= .003
Group by Time Interaction p=.094

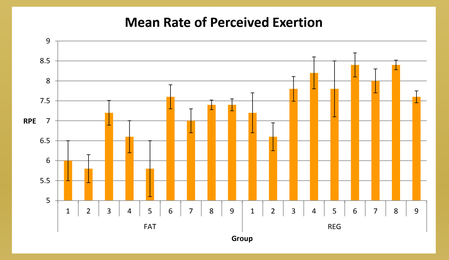

Figure 4. Mean RPE per group by training session

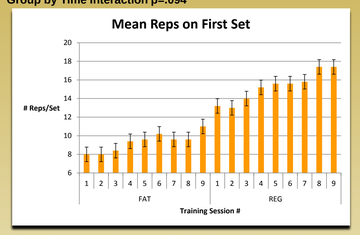

Figure 5. Mean total reps on first set by training session

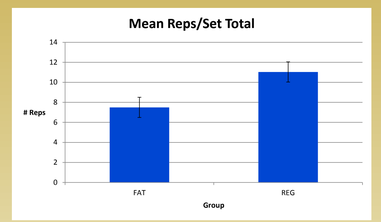

Figure 6. Mean reps per set by group over 4 weeks of training p=.254

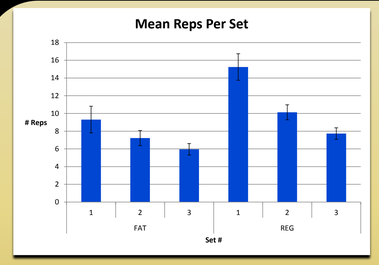

Figure 7. Mean total reps per set between groups p= .192

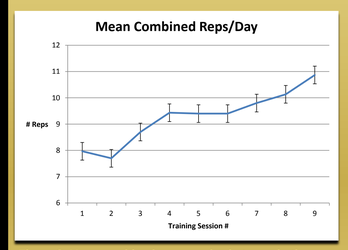

Figure 8. Mean combined reps per day between both groups
Main effect for time, p= .001

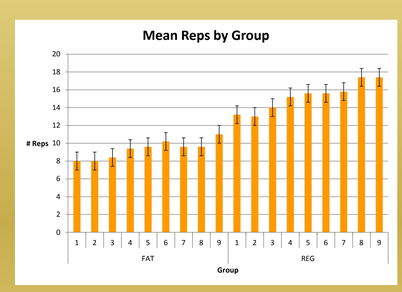

Figure 9. Mean reps per set by training session. P= .229

Limitations

- Lack of statistical power due to small sample size
- Variation between groups due to participant drop out after matched pairs

Conclusions

Due to low statistical power from our small sample size, most of these results did not reach statistical significance.

Results indicated that there was a trend toward a greater increase in left forearm grip strength with FatGripz training (Pre: 50.0 ± 5.61, Post: 54.20 ± 5.13 kgs) than standard training (Pre: 55.6 ± 5.61, Post: 54.86 ± 5.13 kgs, p=.129)

The Fat gripz group tended to increase Lat Pull down 1RM (Pre: 181.0 ± 12.15, Post: 200.0 ± 10.86 lbs,) to a greater degree than the standard group increased from (Pre: 197.0 ± 12.15, Post: 204.0 ± 10.86 lbs, p=0.094)

The mean RPE tended to be higher in the standard group when compared to the Fat Gripz group (p= .190)

The control group tended to complete a higher mean number of reps per set compared to Fat Gripz (main effect for group, p= .254)

Statistically significant results

Lat Pull Down 1RM increased in both groups from Pre test to Post test (main effect for time, p=0.003)

Mean number of reps completed per day increased over the course of the 4 week training period for both groups (main effect for time p= 0.001)

The mean number of reps completed per set decreased with each successive set in both groups (main effect for time p= 0.006)

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