

The effect of KAATSU style exercises on some anthropometric variables of the upper extremities of bodybuilders

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Abstract

The study investigates the role and effect of kaatsu-style resistance exercises for some amateur bodybuilders, as well as the effectiveness of these exercises and the method for hypertrophy the biceps muscle in the upper extremities of the arm. As for the problem that the researcher noticed, that the use of loads of weightlifting exercises continuously and with high intensity and large repetitions can cause injury to the body of the athlete as a result of these exercises or through the association of these exercises with drugs such as steroids or random nutritional supplements used to enhance the effectiveness of training . Avoiding this phenomenon and using the correct relationship between work and rest usually achieves a full recovery. The experimental method was also used for its suitability and the nature of the research, as the research community was chosen by a random method, which numbered (16) athletes, and after analyzing and discussing the results, the researcher concluded that the use of this method according to the kaatsu exercises effectively contributed to amplifying the biceps muscle of amateur bodybuilding athletes.

Key Words: KAATSU exercises – anthropometric – bodybuilders

Introduction

The rapid development of training curricula has prompted trainers and researchers to find various alternatives necessary to develop superior performance in competition and introduce increasingly effective training methods, as many sciences have contributed to the understanding of the effects of exercises and their doses on the body, and together formed a science of their own, called the science of sports training. The latter focuses on athletic performance and aims to understand, measure, and improve the effects of exercise on the body and reduce the incidence of injury both in terms of achievement and prevention. Among the relatively recent training methods are the KAATSU exercises, the restriction of blood flow exercises to working muscles. It aims to develop muscular properties and increase muscle mass and strength. As the KAATSU training method consists of performing low-intensity resistance exercises and one of its training procedures is to place a relatively flexible tape on the part near the lower or upper extremities to be trained on, providing suitable surface pressure. Also, KAATSU training should not be confused with training under under ischemic conditions as indicated by Sundberg (13:50). It is also worth noting that this training does not cause ischemia within the skeletal muscles, but rather enhances the condition of blood pooling in the capillaries within the muscles of the target limbs. Basic and applied clinical research conducted over the past years has shown that KAATSU training not only improves muscle mass and strength in healthy athletes and volunteers, but also benefits patients with cardiovascular and orthopedic diseases.

The research projects focused on the effect of low-intensity KAATSU exercise on blood growth hormone and the chronic effect on muscle enlargement and strength gains, as well as the effects of KAATSU training on muscle size and strength in athletes (14: 308-314.)

Katsu training appears to stimulate endogenous hormonal responses including growth hormone and muscle protein synthesis. Also, resistance training or weights in the sport of bodybuilding is one of the most important factors that help in building muscle mass and its enlargement, as well as the training methods and loads associated with large dietary curricula used by bodybuilding athletes to achieve muscle hypertrophy during a specific time from the start of the curriculum or training and food courses.

Some studies report that muscle hypertrophy does not occur until 3-4 months of intense resistance training has been completed. (9:11) So it seems logical that developing a more effective and efficient method for

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promoting muscle hypertrophy, in a relatively short period of time, would be extremely beneficial to coaches and athletes in the sport of bodybuilding in both performance and economics. Combining low-intensity resistance training (20% of 1-RM) with restricted venous blood flow to working muscles may also provide an alternative method to the traditional high-intensity HIT exercises (80% of 1-RM) currently used in training programs. Weights. (14: 61-65) Therefore, there are no published studies regarding the effects of KAATSU training-induced muscle hypertrophy on Iraqi bodybuilders. Thus, the purpose of this study was to investigate the effects of short-term KAATSU resistance training on the anthropometric semantics of upper arms of bodybuilders.

Research problem

In bodybuilding, athletes strive to get a perfect muscular body image as a primary goal of their training. As developing a healthy body by following exercises according to correct scientific principles is undoubtedly a beneficial and positive endeavor, but it seems that some bodybuilding athletes are looking for negative alternatives that lead them to rapidly and unscientifically inflate muscles by spending long hours in the bodybuilding gym, Squandering excessive amounts of money on ineffective industrial supplements, unnatural eating patterns and even stimulant abuse. As the use of loads of weight-lifting exercises continuously and with high intensity and large repetitions can occur in the body of the athlete as a result of these exercises or through the association of these exercises with drugs such as steroids or random nutritional supplements used to enhance the effectiveness of training. As the use of these illegal drugs and supplements has been reported in a common and increasing manner in this sport, as well as the damage caused by the use of high loads and weights, pressure or prolonged tension may occur on working nerves or muscles during exercise, causing injury, and it may be either Due to postures and movements while lifting weights or due to exertion and overload. Avoiding this phenomenon and using the correct relationship between work and rest usually achieves a full recovery. Therefore, in this research, the researcher used the training method in the Katsu style to provide two important principles: the first is to legalize the stresses or burdens and high requirements in the sport of bodybuilding for muscle inflation and the last is to maintain the safety of athletes from the dangers of injuries and overload, by regulating training doses according to the training of the katsu method That is low stress for bodybuilders.

Aims

- 1-Preparing training doses according to the style of kaatsu exercises for bodybuilding athletes.
- 2-Knowing the effect of kaatsu exercise on the anthropometric variables of the upper limbs of bodybuilding athletes through two stages.

Hypotheses

There are statistically significant differences between the two groups in favor of the experimental group.

Methodology

The researcher used the experimental approach in the manner of two groups of bodybuilding athletes (experimental group (Kaatsu) and the other control.

Participants

Participants was chosen randomly from a group of bodybuilding athletes in Baghdad from the research community, whose number is (25) athletes representing the original research community. The research sample included (16) athletes from the research community who constitute a percentage of (64%) of The original community, the sample was divided into two groups, experimental and control, with (8) players for each group.

Pre-test and measurements

The tests were conducted for the research sample related to the anthropometric variables (measuring the circumference of the upper arm limiting the deltoid muscle) before starting the implementation of exercises in the Katsu style in the study, and under the supervision of the assistant work team, as the researcher sought to record the conditions related to all the tests and record them in terms of time, place, devices, tools and method of implementation This is an attempt by him to create the same conditions and conditions when conducting the post-test. The research sample consisted of bodybuilding athletes to participate in this study. All persons were trained regularly 5 days a week for each group. The sample was randomly divided into two groups: KAATSU training (n = 8) and the control group (n = 8).

Table (1) parametric properties of the participants

Variables	Mean	SD ±	Median	skewness
Age / year	22.625	1.586	22	0.022
Height / cm	172.415	2.874	172	0.101
Body mass / kg	74.5	129.2	75	171.0

Preparing exercises in the KAATSU style

After the warm-up, KAATSU style exercises were performed once daily for four consecutive weeks for 20 minutes. The sample performed 3 sets of 15 repetitions of exercises (Cable Curl, Concentration Curl, Dumbbell Curl, EZ-Bar Curl, Barbell Curl, High Pulley Curl, Dumbbell Preacher Curl) severely (20% of 1-RM). The sample was rested for 30 seconds between sets and exercises, and this measure was kept constant throughout the training period. A specially designed elastic belt was placed around the upper part closest to both arms below the deltoid muscle, during the exercise sessions, as the elastic belt was calibrated according to five degrees fixed on the tape as each degree represents a level of pressure on the target muscles as this pressure was suggested To restrict venous blood flow and cause blood to pool in the muscles distant from the site of restriction, on the first day, the tape pressure was set at the first level and then increased by 10 mm each day until the final pressure was reached to restrict the blood in the target area. The restriction of muscle blood flow was maintained throughout the entire workout session, and was released upon completion of the katsu training doses. The control group did not perform any exercises with restricted blood flow, as the exercises were completely identical between the two groups except for restriction of upper limb muscles for the experimental group and the training intensity was 70% for the control group. However, both KAATSU and the control group carried out regular and equal training. During the study period

Final Exam and Measurements

The final measurement of the anthropometric variable of an arm was performed in the research sample after the end of the exercise period, as the first phase was after two weeks of applying exercises in the stratified method, and the last phase after four weeks of exercises, as the circumference of the biceps muscle was measured for both groups and under the supervision of the same auxiliary work team. And in the same circumstances in which the tribal measurements were made.

Statistical Analysis

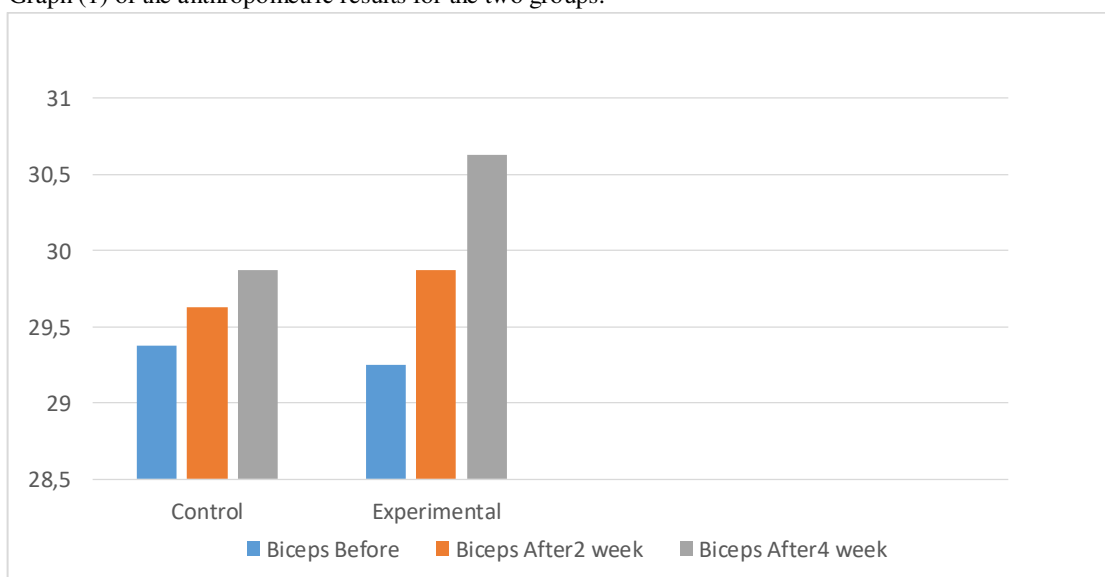
- The researcher used the Statistical Package (SPSS) version 17 in processing the results to reach the achievement of the research objectives.

Discussion:

Table (2) shows the results of anthropometric measurements between the two groups (pre and post)

Variables	N .P	Unit	Control		Experimental		T	Sig	Significance
			Mean	SD ±	Mean	SD ±			
Biceps Before	16	cm	29.37	.744	29.25	.462	.403	.693	Not significant
Biceps After2 week	16	cm	29.65	.517	29.87	.640	.858	.405	Not significant
Biceps After4 week	16	cm	29.87	.353	30.650	.517	3.38	.004	significant

Graph (1) of the anthropometric results for the two groups.



Discussing the results of anthropometric measures for the two research groups, the first group (control) and the second group (experimental):

It is evident from the tables (2) that there are some significant differences between the test results for the two groups on the anthropometric measures represented by (biceps circumference) and in favor of the experimental group, and in the current study we found that four weeks of KAATSU training once a day increased skeletal muscle hypertrophy in bodybuilding athletes Amateur. The size of the increase was relatively small, but it was consistent with the data and had statistical significance between the two groups and in favor of the experimental group after the end of the two periods of exercises. As shown in Table (2) and Chart (1), as the muscle circumference gradually increased throughout the study in the KAATSU group, and perhaps greater muscle hypertrophy occurred if training continued. And conventional resistance training does not result in muscle hypertrophy easily in this category of sample. (8: 419-427) So our data indicate that KAATSU training can provide an effective inflationary stimulus even for well-trained athletes. Interestingly, the training sample in this study conducted a total of 20 units (alone per day) of KAATSU training exercise for 14 consecutive days in the first phase, as the results between the two groups indicated that there was no significant significance between them during the performance of the exercises, but in general there is an improvement. For tribal scales results. The optimal training curriculum is based on the "overcompensation" theory that attempts to generate the largest stimulus for growth while allowing adequate rest between workout doses (181-10: 143). The combination of a multi-level resistance training program can lead to poor event performance because athletes do not. They have enough recovery time between workouts. However, KAATSU training at 20% intensity of 1-RM produces a powerful amplifying stimulus with minimal muscle damage and requires less recovery time as indicated (Takarada et al.) (14:65), thus. Data from the current study showed that KAATSU training can be combined with regular seasonal training to provide an effective and effective method for muscle hypertrophy in seasonal sports without loss of performance. Longer KAATSU training may cause greater muscle enlargement which may then be able to improve performance for bodybuilders.

The magnitude of muscle enlargement has been shown to be similar between katsu resistance training and traditional weight training when the repetitions and training volumes are similar (14: 308) Interestingly, katsu training does not require long recovery periods between training sessions due to the very low mechanical stress and minimal muscle damage. Output when using only 20% load of 1-RM. Which constitutes another factor for the development of anthropometric connotations, as the construction period is greater than the duration of demolition in the working muscles or upper limbs when compared to the traditional weight training method. Several published studies report that muscle hypertrophy can be caused by low-intensity exercise (20% of 1-RM) that is performed while restricting blood flow to the muscles. This training reduces the arterial flow in and out of the vein to the active muscles of the limbs. (11: 1-5) and noted (Abe et al., 2006). Surprisingly, too, walking with reduced blood flow, as in KAATSU exercises, led to significant muscle enlargement and gains in strength. (1: 1460) Some researchers have also indicated that peak training exercises 3 times a week for 5 weeks result in significant increases in muscle size (5-6%) and inflation potential of 0.3-0.5%. (4: 588) (5: 10-18) (12: 368-373) (16-89-98) KAATSU training produced hypertrophic capacity in muscle volume during (20 training units), which is similar to that observed after resistance training exercises High density. (3: 555-563), (9: 1-11)

The similarity in hoarse potential highlights the importance of the compressive training duration and intensity of exercises used during KAATSU training that are standard when compared to traditional resistance training. This finding highlights the importance of the hypertrophic (increased muscle volume) response to KAATSU training. It is interesting that KAATSU training achieved its muscle mass results with the research sample that did not suffer from muscle fatigue or muscle pain. This finding is crucial given the importance of the compressed training duration and, to some extent, the training frequency, which appears to be central to KAATSU low-intensity training. The ability to compress duration of training is definitely related to the use of low-intensity exercise, which does not appear to cause significant muscle damage or delay in recovery, as indicated by the lack of change in blood markers of muscle damage or immune stress as indicated. (6: 1-8), (7: 813-819).

Conclusions

1-Significant differences appeared between the two groups in the anthropometric measures (biceps circumference) in favor of the experimental group in the second phase of the exercises.

2-The results did not show significant differences between the two groups in the first stage of training.

3-The exercises used according to the method of katsu exercises contributed to the enlargement of the biceps muscle of the arms, but it was within normal limits and consistent with the nature of the characteristics of the sample (amateur).

Recommendations

- 1- It is necessary to apply this training method when preparing resistance training doses to develop strength during the competitive season for players in individual and team events.
- 2- There is a need for more surveys to clarify the interactive effects of katsu exercise on the functional, biomechanical, physical, biological and psychological variables of players or athletes.

References

- 1- Abe T, Kearns CF, Sato Y (2006) Muscle size and strength are increased following walk training with restricted venous blood flow from the leg muscle, Kaatsu-walk training. *J ApplPhysiol* 100: 1460-1466.
- 2- Abe T, Sato Y, Yasuda T, Midorikawa T, Inoue K, Kearns CF, Ishii N (2004) Skeletal muscle size and circulating IGF-1 increased after two weeks of twice daily "Kaatsu" resistance training (Abstract). *Med Sci Sports Exerc* 36 [suppl]: S385.
- 3- Ahtiainen JP, Pakarinen A, Alen M, Kraemer WJ, Hakkinen K (2003) Muscle hypertrophy, hormonal adaptations and strength development during strength training in strength-trained and untrained men. *Eur J ApplPhysiol* 89: 555-563.
- 4- Akima H, Takahashi H, Kuno SY, Masuda K, Shimojo H, Anno I, Itai Y, Katsuta S (1999) Early phase adaptations of muscle use and strength to isokinetic training. *Med Sci Sports Exerc* 31: 588-594.
- 5- Bell GJ, Petersen SR, MacLean I, Reid DC, Quinney HA (1992) Effect of high velocity resistance training on peak torque, cross sectional area and myofibrillar ATPase activity. *J Sports Med Phys Fitness* 32: 10-18.
- 6- Fujita T, Brechue WF, Kurita K, Sato Y, Abe T (2008) Increased muscle volume and strength following six days of low-intensity resistance training with restricted muscle blood flow. *Int J KAATSU Training Res* 4: 1-8.
- 7- Goldfarb AH, Garten RS, Chee PD, Cho C, Reeves GV, Hollander DB, Thomas C, Aboudehen KS, Francois M, Kraemer RR (2008) Resistance exercise effects on blood glutathione status and plasma protein carbonyls: influence of partial vascular occlusion. *Eur J ApplPhysiol* 104: 813-819.
- 8- Hakkinen K, Komi PV, Alen M, Kauhanen H (1987) EMG, muscle fiber and force production characteristics during 1 year training period in elite weight-lifters. *Eur J ApplPhysiol* 56: 419-427
- 9- Jones DA, Rutherford OM (1987) Human muscle strength training: the effects of three different regimens and the nature of the resultant changes. *J Physiol* 391: 1-11.
- 10- Kraemer WJ (2000) Physiological adaptation to anaerobic and aerobic endurance training programs. In *Essentials of Strength Training and Conditioning*, 2nd edn, ed. Baechle TR & Earle RW, pp. 143-181. Human Kinetics, Champaign.
- 11- Sato Y (2005) The history and future of KAATSU Training. *Int J KAATSU Training Res* 1: 1-5.
- 12- Sundberg CJ (1994) Exercise and training during graded leg ischaemia in healthy man. *ActaPhysiolScand [Suppl]* 615: 1-50.
- 13- Takarada Y, Nakamura Y, Aruga S, Onda T, Miyazaki S, Ishii N (2000) Rapid increase in plasma growth hormone after low-intensity resistance exercise with vascular occlusion. *J ApplPhysiol* 88: 61-65.
- 14- Takarada Y, Sato Y, Ishii N (2002) Effects of resistance exercise combined with vascular occlusion on muscle function in athletes. *Eur J ApplPhysiol* 86: 308-314.
- 15- Takarada Y, Sato Y, Ishii N (2002) Effects of resistance exercise combined with vascular occlusion on muscle function in athletes. *Eur J ApplPhysiol* 86: 308-314.
- 16- Tesch PA, Ekberg A, Lindquist DM, Trieschmann JT (2004) Muscle hypertrophy following 5-week resistance training using a non-gravity- dependent exercise system. *ActaPhysiolScand* 180: 89-98.