THE IMPACT OF DOWNWARD HIERARCHICAL TRAINING EXERCISES IN THE DEVELOPMENT OF THE POWER OF THE LOWER LIMBS OF YOUNG BODY BUILDING PLAYERS.

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ABSTRACT

The great development that took place in the sports field came as a result of serious scientific research that helped advance the level of all sports games and events, but the share of bodybuilding sport in the Iraqi environment was modest due to the specificity of this sport in terms of the rules and principles followed on the part of the academics. And those with competence for this sport on the other hand. And it became necessary for us to raise the level of youth for the better by setting up training programs according to sound scientific foundations. The study sample included (5) players of the Youth Sports Club for bodybuilding. Physical exercises were prepared in a period of time of (8) by the rate of Two training units every week. The most prominent conclusions were that the application of exercises in the pyramid-descending training method helps to develop the maximum strength of the full body, the posterior rectus muscle and the calf muscle, and improves the increase in the peak of the electrical signal activity (EMG) and its small area. When seeking to develop maximum strength and some electrical activity variables (EMG) for the muscles of the lower extremities of young bodybuilders.

1. DEFINITION OF RESEARCH

2.1 Introduction and the importance of the research

Bodybuilding is a physical fitness sport for the rest of the games as it may be implicitly or mainly involved in the development of some or a group of physical characteristics of many games, and it has become imperative when developing curricula and advanced training methods to use exercises to develop muscle strength using weights by eating the muscle from angles, sides and edges. The sport of bodybuilding was and still is a sport of achievement and higher levels and not only a sport of entertainment, as the athlete’s victory in tournaments represents raising the flag and name of their countries in international forums, and countries boast about the number of medals they get in tournaments. , It is worth noting that the Iraqi sport of bodybuilding needs more than a pause due to the advanced achievements of our athletes on all levels (Arab, Asian and international). Bodybuilding is one of the sports that work to strengthen muscles, increase their size and amplify them, which gives a person an attractive appearance and twisted muscles, and the ideal body that most people aspire to possess, so the performance of various sports exercises is not limited to getting rid of fat and burning calories and grease in body areas In fact, exercises, especially bodybuilding exercises, are considered one of the ways to gain lean body and large muscles, and in light of the progress that is achieved in all sports, the importance of applying scientific rules and modern methods of training to reach high achievements as these sciences have developed and its schools branched out in all parts of the world. The world and we had to keep pace with this development and progress and to be interactive with it. Because we believe that we can reach the higher levels through studied scientific steps, based on the results of research and experiments in all sports fields. The sport of bodybuilding has multiple components as it requires a good understanding as it deals with muscle training of all kinds, and workers in this field must find training programs that include all muscles and know what is reflected in those programs in terms of reactions in the exercise test, its type, the amount of intensity and its suitability for the muscle is something. Important in bodybuilding exercises (Jameel, 2002: 5). Hierarchical training is the form or organization of pregnancy during the training unit by increasing the intensity and decreasing with repetition and this is called hierarchical training.
ascending or decreasing in intensity and increasing the frequency and this is called the hierarchical training descending "(The Most High and My Shagati, 2010: 98) Muscular strength (Al-Hasnawi, 2014: 90-91) is known by (Matviv) as (the ability of the muscle to overcome various resistances) such as: (the weight is external - the body weight - the competitor - the friction force, etc.) It is (the ability of the nervous system to overcome relatively high resistance or face it through the use of the body's muscles.) And due to the lack of studies in the sport of bodybuilding in Iraq, it has become necessary to delve into this topic in order to set the correct and programmed rules in selecting young people Service for the sport. The importance of research lies in the development of an important characteristic, which is the strength characteristic of young bodybuilders, and because it is not possible to identify the extent of this physical trait of bodybuilding athletes except through tests and measurement with a device that measures electrophoresis (EMG). It is a device weighing no more than (390 grams) that is linked around the player's waist by a belt, and this device sends Bluetooth signals about muscle activity to be received by another device known as the receiver for a bluetooth signal linked to a personal computer and the device allows the player to perform all kinds of movements such as bouncing, spinning and running. It is fast, and it is 40 meters away from the location of the signal receiver, to be recorded and stored on a computer for later use (Al Douri, 1988: 14). The (EMG) device is used clinically to know the speed of electrical conduction in the nerves and the extent of the muscle response to diagnose the condition of the neuromuscular system. (Campbell) and his colleagues have indicated that the (EMG) signal is an important method in the diagnosis of electromyography, the study of neuromuscular conduction, the diagnosis of injuries in the peripheral nerves and the study of the generated stress Inside the muscle for the diagnosis of sports injury (Abdel Fattah and Hassanein, 1997: 205). Therefore, the researcher decided to prepare exercises using the hierarchical descending style for the category of youth in the sport of bodybuilding. The fields of research included the human field represented by the players of the Al-Shabab Sports Club, the advanced category, the temporal domain (6-1-2021), and the spatial domain, the Titanium Gym Hall for Fitness and Body Building in Baghdad.

2.2 Research objectives

Preparing exercises in the hierarchical descending training method in developing the maximum strength of the lower extremities of young bodybuilders.

2. Research methodology and field procedures.

2.1 Research methodology.

The nature of the problem to be researched in its aspects determines the approach to be implemented, so the researcher will use the experimental approach to suit the nature of the problem.

The experimental method is defined as (it is a deliberate change that is controlled by the specific conditions of a specific incident and the observation of the resulting changes in the event itself to explain it) (Abdul Hafeez and Bahi, 2002: 107).

2.2 Research population and sample.

The research sample will be chosen by the deliberate method by the researcher from the original society, whose number is (5) players from the youth category from the Al-Shabab Sports Club in Baghdad, where the original community reaches (60) players distributed in Baghdad clubs.

2.3 Devices and tools used in the research.

2.3.1 Research tools

- Personal interviews
- Devices and tools for building bodies of multiple weights
- DELL laptop.
- A modern iPhone mobile imaging device.
- A laptop camera.
- An EMG device to measure the electrophoresis of the muscles.
- Medical cotton.
- Medical plaster.
- Sterile solution.
- Shaving machines.

2.3.2 Targeted lower limb muscles

The posterior biceps (rectus posterior): The rectus femoral biceps passes behind the outer face of the thigh bone, to adhere to the head of the fibula, below the knee, directly.

The anterior thigh (rectus anterior): The rectus femoris and arises from the anterior protrusion of the pelvic bone.

Cost:

The calf muscle consists of two muscles.

1. The calf muscle: It is the external calf muscle of the calf and consists of two medial and lateral heads that originate from the posterior surface of the thigh bone directly above the knee joint.

2. The second plantar ankle: It originates from the posterior surface of the tibia and is located under the layer of the calf muscle

2.4 Research tests

Test name: Full Dipstick Maximum Strength Test

Objective of the test: To measure the apex and area of the anterior and posterior rectus muscles

Devices and Tools:

- EMG device
- Iron bar
- Different weights

Procedures and conditions: (Al-Dabi is completely behind) during the effort and at maximum intensity, and for one time only. The bar is placed on the upper part of the back so that it rests on the trapezius muscle and the bar is held firmly by the hands, and the distance between the feet is shoulder width or slightly wider with the toes pointing out, then the player lowers the body with the head still up, and then the player raises the weight to force the feet up and keep the body erect while returning to the starting position.

- Registration: giving an attempt to an oasis for the player as hard as possible.
- Measuring unit: the muscle vertex is measured in microvolts, as for the area (in microvolts).
- Test name: Maximum strength test for curl back legs
- Objective of the test: to measure the apex and area of the posterior rectus muscle
- Devices and Tools:
  - EMG device
- Curl device, front legs, sitting, American of origin.
Procedures and conditions: a back leg proxy. The tested player lies on the rear leg proxy device, his hands rest on the handles of the device, and the retractor is placed on the posterior straight muscle, so the player bends his legs back with maximum force and records the reading of the device.

- Registration: giving an attempt to an oasis for the player as hard as possible.
- Measurement unit: the muscle vertex is measured in microvolts, with the area measured in microvolts.
- Test name: test of the maximum strength of the thrust during the voltage
- Objective of the test: To measure the apex and area of the calf muscle.

Devices and Tools:

- EMG device.
- Calf device of American origin.

Procedures and conditions: The laboratory player stands on the calf device with his hands tightly on the grip of the device, and the retainer is placed on the calf muscle, and when the player's ascending movement to the top, the reading of the device is recorded with maximum force.

Registration: giving an attempt to an oasis for the player as hard as possible.

Measurement unit: The muscle vertex is measured in microvolts, as for the area (in microvolts).

3-6 Exploratory Experience:

In order to avoid the researcher from making mistakes, and in order to reach the implementation of the research steps within the scientific controls, an exploratory experiment was conducted to ensure the safety of the (emg) device on the date (12-15-2020) in the College of Nursing and also an exploratory experiment was conducted on a sample of (3 players) from outside the research sample on (1-5-2021), where the devices and tools used were identified and their safety was assured. And to ensure the efficiency of the work of the assisting team, as well as to determine the appropriate time to test the test and to take advantage of some of the errors that the researcher and the work team faced through the exploratory experiment and an attempt to correct them in the main experiment such as installing the collector and confirming that the signal is connected to the device.

2.5 Pre-tests.

The pre-tests were conducted on (6-1-2021) on the research sample of 5 players for one experimental group for the descending style. And that is in the Titanium Gym hall located in the Mansour area at one o'clock in the afternoon. The pre-tests lasted for four days at 1 pm in the Titanium Gym Hall of Fitness and Body Building.

• The training curriculum of the experimental group
• The duration of the training curriculum (8 weeks).
• The total number of training units (16 units).
• The number of training units per week (2).

Training days (Sat - Tuesdays).
• The intensity used (80% - 100%).
• The time of one repetition (6 seconds).
• Total time for exercise and rest (654 seconds).
Rest time between exercises (120 seconds).

• Rest time between totals (180 seconds).

2.6 Dimensional tests:

• The researcher conducted the dimensional tests on (3/17/2021) in the Titanium Gym Hall, at the same time and under the same conditions in which the pre-tests were conducted, on (01/14/2021).

2.7 statistical methods:

Statistical methods:

The researcher verified the results by using the statistical package system (SPSS) version (V26), (statistical package for social sciences).

3- Presentation of results

3-1 Presentation of the results of the maximum strength tests of the complete DBNI and measuring (EMG) tribal and dimensional for the experimental group:

Table (1) shows the results of the t-test for the correlated samples for each of the experimental group in the pre and post tests for the maximum strength of the complete dipstick and the measurement of electrical activity (EMG)

<table>
<thead>
<tr>
<th>Test</th>
<th>The pretest</th>
<th>Post-test</th>
<th>Then</th>
<th>P. P</th>
<th>(T)</th>
<th>(Sig) Degree</th>
<th>indication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>s</td>
<td>P+</td>
<td>s</td>
<td>P+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The maximum strength of a full dipstick</td>
<td>118</td>
<td>5.701</td>
<td>123.4</td>
<td>2.51</td>
<td>5.4</td>
<td>3.435</td>
<td>3.515</td>
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<tr>
<td></td>
<td>119</td>
<td>5.477</td>
<td>127.2</td>
<td>2.683</td>
<td>8.2</td>
<td>3.033</td>
<td>6.045</td>
</tr>
<tr>
<td>The rectus muscle signal the top</td>
<td>765.6</td>
<td>25.066</td>
<td>798.4</td>
<td>15.485</td>
<td>32.8</td>
<td>10.085</td>
<td>7.273</td>
</tr>
<tr>
<td></td>
<td>767.4</td>
<td>28.824</td>
<td>822.8</td>
<td>3.564</td>
<td>55.4</td>
<td>31.501</td>
<td>3.933</td>
</tr>
<tr>
<td>The front right Space</td>
<td>75.8</td>
<td>3.271</td>
<td>73</td>
<td>2.345</td>
<td>2.8</td>
<td>2.049</td>
<td>3.055</td>
</tr>
<tr>
<td></td>
<td>74.8</td>
<td>1.304</td>
<td>65.6</td>
<td>0.894</td>
<td>9.2</td>
<td>1.304</td>
<td>15.778</td>
</tr>
<tr>
<td>The rectus muscle anterior left the top</td>
<td>731.8</td>
<td>3.962</td>
<td>772</td>
<td>14.16</td>
<td>40.2</td>
<td>13.9</td>
<td>6.467</td>
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<tr>
<td></td>
<td>730.4</td>
<td>3.782</td>
<td>803.6</td>
<td>3.435</td>
<td>73.2</td>
<td>6.181</td>
<td>26.483</td>
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<tr>
<td></td>
<td>82.6</td>
<td>2.702</td>
<td>79.2</td>
<td>2.588</td>
<td>3.4</td>
<td>1.817</td>
<td>4.185</td>
</tr>
<tr>
<td></td>
<td>82</td>
<td>4.416</td>
<td>70.4</td>
<td>1.517</td>
<td>11.6</td>
<td>3.715</td>
<td>6.982</td>
</tr>
</tbody>
</table>

Significance of difference (Sig) ≥ (0.05) at a level of significance (0.05), and degree of freedom n-1 for each group
Figure (1) shows the tribal and dimensional arithmetic meanings of the experimental research group in the maximum strength test of the complete squat.

3.2 Presentation of the results of the maximal strength tests of the posterior curl legs and the pre- and dimensional EMG measurement of the experimental group:

Table (2) shows the results of the t-test for the correlated samples of the experimental research group in the pre and post tests of the maximum strength of the rear legs curl and the measurement of electrical activity (EMG).

<table>
<thead>
<tr>
<th>The exams</th>
<th>The pretest</th>
<th>Post-test</th>
<th>Then</th>
<th>P. P</th>
<th>(T)</th>
<th>(Sig) Degree</th>
<th>indication</th>
</tr>
</thead>
<tbody>
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<td>P +</td>
<td>s</td>
<td>P +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back legs curl</td>
<td>58</td>
<td>6.708</td>
<td>60</td>
<td>6.877</td>
<td>2.4</td>
<td>0.548</td>
<td>9.798</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>5</td>
<td>68</td>
<td>1.789</td>
<td>8.2</td>
<td>3.271</td>
<td>5.605</td>
</tr>
<tr>
<td>The rectus muscle signal</td>
<td></td>
<td></td>
<td>640.2</td>
<td>5.357</td>
<td>685.4</td>
<td>5.595</td>
<td>45.2</td>
</tr>
<tr>
<td>The front right</td>
<td></td>
<td></td>
<td>641.6</td>
<td>7.403</td>
<td>719.8</td>
<td>5.07</td>
<td>78.2</td>
</tr>
<tr>
<td></td>
<td>75.2</td>
<td>4.438</td>
<td>71.8</td>
<td>4.382</td>
<td>3.4</td>
<td>1.14</td>
<td>6.668</td>
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<tr>
<td></td>
<td>76</td>
<td>3.536</td>
<td>63.8</td>
<td>2.387</td>
<td>12.2</td>
<td>5.167</td>
<td>5.279</td>
</tr>
<tr>
<td>The rectus muscle anterior left</td>
<td></td>
<td></td>
<td>627.4</td>
<td>4.637</td>
<td>663.2</td>
<td>10.01</td>
<td>36.2</td>
</tr>
<tr>
<td></td>
<td>626.2</td>
<td>1.643</td>
<td>686.6</td>
<td>7.021</td>
<td>60.4</td>
<td>6.693</td>
<td>20.178</td>
</tr>
<tr>
<td></td>
<td>81</td>
<td>3.536</td>
<td>77.8</td>
<td>3.114</td>
<td>3.2</td>
<td>2.168</td>
<td>3.301</td>
</tr>
<tr>
<td></td>
<td>83.8</td>
<td>1.483</td>
<td>66</td>
<td>1.414</td>
<td>17.8</td>
<td>1.643</td>
<td>24.223</td>
</tr>
</tbody>
</table>
Significance of difference (Sig) ≥ (0.05) at a level of significance (0.05), and degree of freedom n-1 for each group.

Figure (2) shows the tribal and dimensional arithmetic meanings of the experimental search group in the maximal strength test of the posterior curl.

3-3 Presentation of the results of the tests of maximum strength of the stress during the effort and measuring (EMG) tribal and dimensional for the experimental group:

Table (3) shows the results of the t-test for the correlated samples of the experimental research group in the pre and post tests for the maximum force of the cost during the voltage and the measurement of electrical activity (EMG)

<table>
<thead>
<tr>
<th>the exams</th>
<th>The pretest</th>
<th>Post-test</th>
<th>Then</th>
<th>P, P</th>
<th>(T)</th>
<th>(Sig) Degree</th>
<th>indication</th>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum voltage during effort</td>
<td>142</td>
<td>10.368</td>
<td>143.4</td>
<td>10.31</td>
<td>1.4</td>
<td>0.894</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>143</td>
<td>12.042</td>
<td>158</td>
<td>2.739</td>
<td>15th</td>
<td>9.354</td>
<td>3.586</td>
</tr>
<tr>
<td>Maximum voltage during effort</td>
<td>582.2</td>
<td>18.458</td>
<td>617.4</td>
<td>5.857</td>
<td>35.2</td>
<td>18.979</td>
<td>4.147</td>
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<tr>
<td></td>
<td>577.4</td>
<td>19.178</td>
<td>681.2</td>
<td>5.31</td>
<td>103.8</td>
<td>15.057</td>
<td>15.415</td>
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<tr>
<td>Left fascicle muscle signal</td>
<td>79</td>
<td>3.317</td>
<td>74.8</td>
<td>4.324</td>
<td>4.2</td>
<td>1.304</td>
<td>7.203</td>
</tr>
<tr>
<td></td>
<td>78</td>
<td>4.848</td>
<td>63</td>
<td>2.345</td>
<td>15th</td>
<td>3.536</td>
<td>9.487</td>
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<td>Left fascicle muscle signal</td>
<td>519.6</td>
<td>2.074</td>
<td>597.2</td>
<td>9.176</td>
<td>77.6</td>
<td>9.864</td>
<td>17.591</td>
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<td></td>
<td>515.8</td>
<td>8.526</td>
<td>625.8</td>
<td>5.404</td>
<td>110</td>
<td>12.708</td>
<td>19.355</td>
</tr>
<tr>
<td>Left fascicle muscle signal</td>
<td>83.4</td>
<td>3.647</td>
<td>80.4</td>
<td>1.517</td>
<td>3</td>
<td>2.345</td>
<td>2.86</td>
</tr>
</tbody>
</table>
Significance of difference (Sig) ≥ (0.05) at a level of significance (0.05), and degree of freedom n-1 for each group

Figure (3) shows the pre and post arithmetic means for the experimental research group in the test of the maximum strength of the cost during the effort.

3-4 Discuss the results

3-4-1 Discussion of the results of the maximum strength tests of the complete diphtheria and the measurement of electrical activity (EMG) pre and post for the experimental research group:

From a review of the results of the pre and post tests for the maximum strength tests of the complete squat, it becomes clear that the bodybuilders in the experimental group who applied the hierarchical descending training method all have developed muscle strength towards a positive development in the post-tests than it was in the pre-tests, as well as an increase in the top The electrical activity (EMG) of the rectus femoris muscle (Rectus Femoris) and its smaller wave area in the post-tests than it was in the pre-tests also indicated the effect of exercises in a descending hierarchical manner.

3-4-2 Discussing the results of the tests of maximum strength of curl hind legs and measuring electrical activity (EMG) pre and post for the experimental research group:

From a review of the results of the pre and post test schedule for the maximum strength tests of the curl back legs, it becomes clear that the bodybuilders in the experimental group who applied the hierarchical descending training method all had muscle strength towards an increase in the post-tests than in the pre-tests, as well as an increase in the top The electrical activity signal (EMG) is smaller in area in the dimensional tests than it was in the pre-tests as well.

3-4-3 Discussing the results of the tests of maximum force of the cost-effective during the voltage and measuring electrical activity (EMG) before and after the experimental research group:

By referring to the results of the table of the pre and post tests, the tests of the maximum strength of the costs during the effort showed that the bodybuilders in the experimental group who applied the hierarchical descending training method all had muscle strength towards an increase in the post-tests than in the pre-tests, as well as an increase in the peak The electrical activity signal (EMG) is smaller in area in the dimensional tests than it was in the pre-tests as well.
4. CONCLUSIONS AND RECOMMENDATIONS.

4.1 CONCLUSIONS.
Applying exercises in a descending method of training helps to develop the maximum strength of the full posterior, posterior rectus and calves muscle, and improves the increase in peak electrical signal activity (EMG) and the decrease in its area.

4.2 RECOMMENDATIONS.
Generalizing the results of this study when seeking to develop and develop the maximum strength of the muscles of the lower extremities of young bodybuilders

Summery:
In light of the results reached by the research, the researcher concluded that training for the hierarchical descending has a positive effect on developing strength, and that the gradual training stresses according to a standardized scientific framework that helps in the speed of development of physical abilities other than training and using a single high intensity training. At the beginning of the training unit and its graduation. The researcher recommends using hierarchical training in a descending method in developing the strength of bodybuilding players and gradually using stress for this type of training during the training unit, as well as conducting studies to reveal the effectiveness of hierarchical training by using other training methods and methods and the physical development of physical training and influence on physical development.

REFERENCES