International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 04, 2020
ISSN: 1475-7192

Orthosis of the Shoulder Muscles In Terms of Their Electrical Activity as an Indicator to Improve Their Functional Condition in Weightlifters with Muscle Tear after Rehabilitation

Dr. Nateq Abdul-Rahman Waritha Al-Lami and Dr. Diaa Salem Hafez

Abstract--- *The study aimed to measure the electrical activity of shoulder muscles for lifters with muscle rupture after their rehabilitation, and to identify the evaluation of shoulder muscles in terms of their electrical activity as an indicator to improve their occupational status among weightlifters with muscle rupture after their rehabilitation, and the researchers adopted the descriptive research method of scanning a sample of male lifters in The different clubs of Maysan governorate, aged (17-19) years after completing the physical therapy stage for a period of (5-7) days, whose number is (62) injured, who were deliberately selected at a rate (84.932%) of the parent community, and they are those who go to the Physiotherapy Division in a hospital Chest a For a year within the formations of the Maysan Health Department during a period of six months, the researchers were able to collect them procedurally after coordinating with the hospital to conduct electrical planning measurements for the shoulder muscles, and the homogeneity of the research sample was verified in some variables that unite their characteristics, and examined them with the electrical muscle planning device (EMG) clinical type And the treatment of their results statistically with the (SPSS) program, and (6) specific criteria were derived for their evaluation after processing the results of this measurement, and the researchers concluded that it is not possible to rely on the results of modern systems technology to measure the functional improvement of the muscles in evaluating the state of the weight lifter unless the approved levels are approved It is an indication of its results, and that the measurement used by the two researchers achieved reliable and standardized levels in evaluating the functional improvement of the muscles after their rehabilitation.*

Keywords--- *Rehabilitation, Orthosis of the Shoulder, Condition in Weightlifters.*

I. INTRODUCTION

It is no secret to academics in the various disciplines of sports science that it is not possible to separate between measurement and evaluation in mathematical rehabilitation and sports physiology because they are two parallel processes, as the evaluation process is complementary to the measurement, and the quantitative measurement is qualitative evaluation, hence the importance of evaluation and the need for it after the measurement process when it is imposed or Knowledge of scientific research requires it when arriving at facts and judging them for what serves specialized sciences in physical education, especially sports training, which depends on familiarity with many

Dr. Nateq Abdul-Rahman Waritha Al-Lami, Assistant Prof. , College of Physical Education and Sports Science, University of Maysan, Iraq.
E-mail: natikallami1970@gmail.com
Dr. Diaa Salem Hafez, College of Physical Education and Sports Science, University of Maysan, Iraq.

DOI: 10.37200/IJPR/V24I4/PR201453
Received: 15 Jan 2020 | Revised: 15 Feb 2020 | Accepted: 26 Feb 2020

sciences, including those that concern players and their physical and psychological health ... and others, and no A coach here requires a broad culture to draw from these sciences to serve the training process and advance the levels of players for the best that can be taken into account taking into account their health condition, especially those who return from therapeutic rehabilitation programs, and that the sport of weight lifting is a sport in which various muscular injuries are the result of bearing burdens Loads, some of which may not be properly codified, which lead to muscle rips of various degrees, the weight lifter stops attending training units, and then deprives him from participating in tournaments, thus wasting the efforts exerted if his safety is scientifically confirmed after a return. The period of completion of the rehabilitation program, and this assurance should definitely be free from jurisprudence and adopt the foundations and scientific principles.

II. RESEARCH PROBLEM

The measurement process in all sciences gives numerical connotations and it is not possible to judge the nature of these numbers unless there is a method that can be adopted in the evaluation of what these numbers express, and as it is known that the evaluation adopted in the tests is either to be standard reference or referee reference, and by virtue of The researchers worked as academics and trainers for weightlifting sports, noting the need for the player to return to training units or participate in competitions after improving his job status for working muscles with muscle rupture. They need to be clinically verified of similarity to recovery and not judgments through experimentation with Weighing weights with specific weights and progression as followed by some trainers who need to know the qualification, and the novelty of technology in human medicine and sports rehabilitation has provided several diagnostic devices, including the clinical (EMG) device, but the interpretation of the planning values in terms of electrical activity needs to be judged by specific criteria for being Both the peak and the time of electrical activity appear in the form of a chart and it needs a specialist that is difficult to find in the training halls, so the need to explain this digital planning and judge its levels has become necessary for weightlifters to maintain the safety of their players when they return to training.

III. RESEARCH AIMS

1. Measuring the electrical activity of the shoulder muscles of the weightlifters with muscle tear after rehabilitation.
2. Identify the shoulder muscles straightening in terms of their electrical activity as an indicator to improve their functional condition in the weight lifters with muscle tear after rehabilitation.

IV. RESEARCH FIELDS

The human field: A sample of weightlifters who have been rehabilitated from rupture of shoulder muscles who attend the Physical Therapy Division at Al Sadr General Hospital in Maysan.

Time range: for the period from 11/26/2017 to 4/26/2018.

Spatial domain: Iraq/ Maysan/ Al-Amara/ Physiotherapy Division at Al-Sadr General Hospital in Maysan.

DOI: 10.37200/IJPR/V24I4/PR201453
Received: 15 Jan 2020 | Revised: 15 Feb 2020 | Accepted: 26 Feb 2020

V. RESEARCH METHODOLOGY AND FIELD PROCEDURES

Research Methodology

The researchers adopted the descriptive research method, which is defined as "research that depends on the study of reality or phenomenon as it exists in reality and is interested as an accurate description through the qualitative expression that describes the phenomenon and clarifies its properties, or the quantitative expression that gives a numerical description that clarifies the amount and size of the phenomenon (1).

Research community and sample

The specificity of the study problem requires determining the research community in this type of studies to suit the observed phenomenon. According to this, it is determined by the male weightlifters in the different clubs of Maysan Governorate at the age of (17-19) years after their completion of the physical therapy stage, numbering (73) an injured who are attending the Physical Therapy Division of Al-Sadr General Hospital within the formations of the Maysan Health Department during a period of six months. The researchers were able to collect them procedurally after coordination with the hospital to conduct electrical planning measurements of the shoulder muscles, as they are a society that achieves the purposes of the study, and the availability of physical and human capabilities that The study procedures, as well as the hospital administration's cooperation in completing the application of the vocabulary of this study, serve after obtaining their full information from this hospital, which is by identifying and after excluding (1) the left shoulder, and (4) those with vascular damage with their injury, and (6) Injured due to their lack of commitment to hospital review, making the number of the study sample (62) injured (84.932%) of the parent community.

Table 1. The homogeneity of the research sample is shown in some variables that unify the characteristics of the sample

Variable	Measuring Unit	N	Arithmetic Mean	Mediator	Standard Deviation	Coefficient of Torsion
Chronological age	Year	62	17.21	17	1.161	0.166
Body mass index (BMI)	Kg / m2	62	21.82	21	1.466	0.834
Age of injury	day	62	52.26	52	2.975	0.58
Duration of symmetry from injury	From 3-5 Dyes					

Body mass index = weight in kg/ square of height in meters

It is noted from the results of Table (1) that the values of the convolution coefficients were specified between (+ 3), which means that the results of the variables are homogeneous and that they are within all normal distribution.

Scientific research tools and devices used in it:

1. Arab and foreign sources.
2. International Internet Information Network.
3. Clinical Electromyography (EMG) type with its attachments.
4. Manual dynamometer.

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VI. FIELD RESEARCH PROCEDURES

Defining the search variable

That the type of injury imposed on the two researchers to determine the shoulder muscle after it recovered as a variable for the study.

Measurement instrument specifications

EMG

The researchers used the EMG device to measure the electrical activity of the shoulder muscles, as shown in Figure (1). The device consists of the following parts -

Monitor: It measures 17 knots, showing all the diagrams, measurements and shapes of the muscle to be measured.

Keyboard: used for the purpose of writing the player's name, gender, age, etc....

System unit: all parts of the device are connected from a screen and a keyboard.

Tie box: It is hung on a column that contains several outlets from which wires are attached and attached to the recording electrodes that are placed on the muscle to be measured.

A printer: through which a stable recording of the displayed signs can be obtained by printing them on A4 paper

Recording electrodes: The recording process was done using a pair of electrodes, the first electrode was in the form of a needle length (28 mm) tingling in the muscle. As for the second electrode, it was in the form of a silver chloride tablet with a diameter of (8 mm) placed on the surface of the skin and fixed on a strip of skin attached to the muscle to reduce signal interference.

Figure 1: Demonstration of EMG specification

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Registration process

The registration process was carried out in a room with a temperature rate of (22 - 25) degrees by pricking the recording electrode at the origin of the twin muscle, while the second (ground) electrode is attached to the muscle slug. The maximum force test using the dynamometer was used in the recording process, not the usual and common method for examining patients and injured as the needle was inserted into the muscle and then the laboratory raises the arm to the top to produce the highest accessible force that will appear on the dynamometer as well as electrical indicators of the muscle will appear On the EMG. As it depends on the muscle layout in the diagram that shows the first two axes, Turns / sec represents the number of kinetic units per second, while the second axis represents Amplitude / sec, that is, the range rate (peak contraction), thus reading the unit of measurement (Amplitude / Turns) .Mv * sec) peak electrical activity / range (microfolt \ sec) during peak muscle contraction.

The main experience

This type of studies does not need to conduct the exploratory experiment because it was supervised by specialists in the physiological measurement of muscles, and thus the researchers began conducting the main study from Sunday 26/11/2017 until Thursday 26/4/2018, and over a period of (6) months to obtain The largest amount of data of the injured with this type of injury, and each patient was measured after the completion of the qualification program of the EMG and recording the results of the electrical activity according to the previously mentioned equation in preparation for statistically processing it to derive the criteria and then achieving the goal of the study with the required evaluation.

Statistical means

The researchers used the SPSS version (V24), statistical package for social sciences, and the percentage values, the mean, the standard error of the mean, the standard deviation, the median, the convolution coefficient, and the standard degree equations (automatically) were extracted. Z), and the modified standard score.

View and analyze results

Display the results of the statistical parameters of EMG analysis and analysis:

The description requires the presentation of statistical features, as shown in Table 2:

Table 2: Shows the statistical parameters of the test results

Test	Measuring Unit	N	Arithmetic Mean	Standard Error	Mediator	Standard Deviation	Coefficient of Convolution
Electromyography (EMG)	Microvolt / S	62	1.624	0.044	1.532	0.346	1.696

The results of Table (2) show that the mean of the research sample in the measurement results reached (1.624) with a standard error of the mean (0.044) and a standard deviation (0.346), the median (1.532), and the convolution coefficient (1.696).

4-2: Presenting the results of setting the standard levels of the EMG test

In order to derive the criteria for testing the electrical activity of the scapular muscle, the results of the research sample of (62) lifters were arranged in ascending order to set the standard levels as shown in Table (3):

DOI: 10.37200/IJPR/V24I4/PR201453
Received: 15 Jan 2020 | Revised: 15 Feb 2020 | Accepted: 26 Feb 2020

Table 3: Show the rough, standard, and modified standard scores for EMG test results

No.	Raw grade	Standard score	Modified standard score	N	Raw grade	Standard score	Modified standard score
1	1.114	-1.47576-	35.24	32	1.532	-0.26691	47.33
2	1.129	-1.43238-	35.68	33	1.555	-0.2004	48
3	1.182	-1.27853-	37.21	34	1.562	-0.18015	48.2
4	1.258	-1.05931-	39.41	35	1.562	-0.18015	48.2
5	1.268	-1.03039-	39.7	36	1.628	0.01072	50.11
6	1.294	-0.9552	40.45	37	1.638	0.03964	50.4
7	1.325	-0.86555	41.34	38	1.638	0.03964	50.4
8	1.364	-0.75276	42.47	39	1.638	0.03964	50.4
9	1.369	-0.7383	42.62	40	1.662	0.10905	51.09
10	1.369	-0.7383	42.62	41	1.672	0.13797	51.38
11	1.382	-0.70071	42.99	42	1.672	0.13797	51.38
12	1.386	-0.68914	43.11	43	1.682	0.16689	51.67
13	1.389	-0.68046	43.2	44	1.699	0.21605	52.16
14	1.391	-0.67468	43.25	45	1.713	0.25654	52.57
15	1.392	-0.67179	43.28	46	1.736	0.32305	53.23
16	1.399	-0.65154	43.48	47	1.782	0.45608	54.56
17	1.399	-0.65154	43.48	48	1.782	0.45608	54.56
18	1.423	-0.58214	44.18	49	1.822	0.57176	55.72
19	1.436	-0.54454	44.55	50	1.822	0.57176	55.72
20	1.452	-0.49827	45.02	51	1.825	0.58044	55.8
21	1.452	-0.49827	45.02	52	1.825	0.58044	55.8
22	1.456	-0.4867	45.13	53	1.826	0.58333	55.83
23	1.459	-0.47803	45.22	54	1.875	0.72504	57.25
24	1.462	-0.46935	45.31	55	1.942	0.9188	59.19
25	1.463	-0.46646	45.34	56	1.942	0.9188	59.19
26	1.469	-0.44911	45.51	57	2.028	1.16751	61.68
27	1.481	-0.4144	45.86	58	2.263	1.84713	68.47
28	1.482	-0.41151	45.88	59	2.331	2.04378	70.44
29	1.482	-0.41151	45.88	60	2.451	2.39082	73.91
30	1.498	-0.36524	46.35	61	2.762	3.29023	82.9
31	1.532	-0.26691	47.33	62	2.882	3.63726	86.37

Standard score (x = 0) (+ p = 1)

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Table (3) shows that the mean for the (z) scores was (zero) and the standard deviation (1) and that their values are between (+3), which means that the test scores are distributed naturally, as the raw score was statistically processed and then extracted what It is matched in the last field of the table that represents the test score after modifying the standard scores according to the equation (the z-score (standard) x 10 + 50), and for the purpose of deriving the standard levels of the electrical muscle planning test (EMG), and then the table data was tabulated (3) and put standard levels and iterations are based on the z-score values As shown in Figure 2 and shown in table 4.

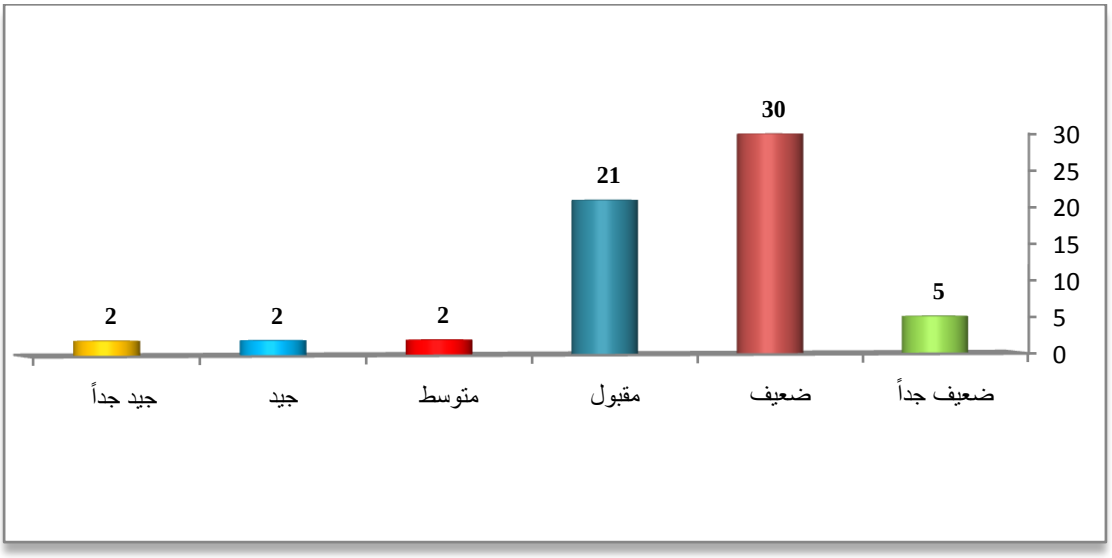

Figure 2: Demonstration of the frequency of the sample in the standard EMG test.

Table 4: Shows the EMG levels

Standard score	Modified standard score	Standard level	Number of players (iterations)	percentage
(- 2) Below	29 Below	Very weak	5	% 8.065
(-1.99) - (-1)	39 – 30	Weak	30	% 48.387
(-0.99) - (zero)	49 – 40	Acceptable	21	% 33.871
(0.01) - (1)	59 – 50	Average	2	% 3.223
(1.01) - (2)	69 – 60	good	2	% 3.223
(2.01) or more	70 or more	very good	2	% 3.223

(N = 62)

It is noted from the results of Table (4) that the number of heavy lifters is at a very weak level (5) with a percentage (8.065%), and the number of heavy lifters has been within a weak level (30) with a percentage (48.387%), while the number of heavy lifters is at an acceptable level (21) with a percentage (33.871%), and the number of weight lifters was at an average level (2) with a percentage (3.223%), while the number of weight lifters is at a good level (2) with a percentage (3.223%), while the number of weight lifters is at a good level Very (2) with a percentage (3.223%). Thus, the electrocardiogram test after its similarity to recovery has achieved (6) standard levels for which weight lifters are distributed naturally.

DOI: 10.37200/IJPR/V24I4/PR201453
Received: 15 Jan 2020 | Revised: 15 Feb 2020 | Accepted: 26 Feb 2020

VII. DISCUSS THE RESULTS

From a review of Table (2) and a comparison of the arithmetic mean with the standard calendar table, reference (3) shows that the research sample was within a weak level, and this calls for verification of the physiological measurement to make sure of the similarity of the injury according to what came in the need to identify the problem and goals of this study, What enhances the role of the post-measurement evaluation with the electrocardiogram, and avoiding the ill-considered judgments that harm the weight lifter. Juergen Scheffer states, "Injuries are often difficult to diagnose and treat, in most cases the internal problem is an inflammation." (1)Salah al-Din Mahmoud Allam states, "The characteristics of the reference group from which the criteria are derived should be taken into account, and how they are similar to the characteristics of the individuals who will make decisions about them in the light of these criteria, which are not absolute or stable, but are relative criteria that depend mainly on specific reference groups, and these are affected. The criteria have a significant impact by changing the characteristics of these groups, with which the individual compares a particular feature, or group of features, that the test measures. (2). Raheem Al-Azzawi believes that the evaluation "is to search and reveal the extent to which the set goals have been achieved - that is, what is required to achieve them, and that it is a diagnosis and treatment of the defect" (1). Bilal Khalaf believes, "The evaluation is the process of issuing a judgment and is not limited to the quantitative identification of phenomena as is the case in measurement, but it goes beyond that. It refers to judging the value of these phenomena, such as presenting them as excellent, good, or medium, and the judgment is used with reference. To a general framework of forces and relationships, and the concepts of measurement and evaluation often confuse, and measurement describes a quantitative description and does not extend to a specific ruling. (2)

Hussein and return to the normal function of the muscle after recovery notes that "the arrival of the instruction causes the release of the motor end plate of acetylcholine, which is the specialized nerve link between the end of the nerve and the muscle fiber (the neuromuscular junction) and binds to the sarcolema with acetylcholine receptors. This causes the opening of the sodium channels, and leads to a flow of Sodium is under the tendency of its concentration to muscle fibers, leading to the depolarization of the membrane. Therefore, the effect of the directive applies to the length of the muscle sarcolema in both directions and below the membranous bonds and leads to the complete contraction of the muscle fibers. For sites where the membranous bonds adjacent to the sarcoplasmic reticulum (the father) cause the latter to cause the release of calcium (temporarily calcium ion) and the sarcoplasm releases a concentration of calcium that rises above (10 (M), this permits the formation of transient bridges to begin as described previously. Returns calcium to the sarcoplasmic reticulum (usually within about 30 ms) and when the calcium concentration in the sarcoplasm becomes too low, and it prevents terbomycin again, and this chain of events is repeated when another motor nerve stimulus arrives at the motor end plate. When the impulse frequency is high, calcium ions continue to release from the sarcoplasmic reticulum and the concentration of calcium in the sarcoplasm surrounds the capillary increases a lot, in which case the muscle fibers do not completely relax between stimulation and the successive contraction will be stronger, firmer and more (to some extent) until nervous stimulation stops(3).

The raw grades must be converted to standard degrees in order to reach the standards. It is known that the standards are one of the primary goals that the process of codifying the tests aims, as the criteria are derived from

DOI: 10.37200/IJPR/V24I4/PR201453
Received: 15 Jan 2020 | Revised: 15 Feb 2020 | Accepted: 26 Feb 2020

the rationing sample that represents the research community studied, and the raw score is the original derivative result." From applying the tests before they are statistically treated and they are the source of the criteria. ”(1)

VIII. CONCLUSIONS AND RECOMMENDATIONS

1. It is not possible to rely on the results of the modern systems technique to measure the functional improvement of the muscles in evaluating the state of the weight lifter unless the standard levels of their results are approved.
2. That the measurement used by the researcher achieved (6) standard and reliable levels in evaluating the functional improvement of the muscles after their rehabilitation.

IX. RECOMMENDATIONS AND PROPOSALS

1- It is necessary to pay attention to continuing scientific efforts to determine levels of physiological indicators whose results are derived from medical and mathematical measurement technology devices.

2- Carrying out similar research on other variables within the measurements of the electro-muscle device.

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DOI: 10.37200/IJPR/V24I4/PR201453
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