



The Study of Rectus Femoris Activity after Knee Joint Rehabilitation

Haytham Ali Alsayigh^{1*}, Nabeel Abdulkadhim Athab²

¹University Of Babylon//The College Of Medicine/ FIMBS in Clinical Anatomical Surgery, Iraq

²University Of Babylon//The College Of Physical Education/ Ph.D. In Sports Medicine, , Iraq

Abstract : That maintaining on the knee joint stability, requires a balance of the surrounding muscle strength to the joint, including the rectus femoral muscle, and what happened from a defect in the output of knee joint because the continuous stress and imbalance of the surrounding muscle strength, so it was preparing a rehabilitation program that includes the use of a (TENS) and exercises therapeutic static and dynamic continued program in two phases stage at the tenth week later was measured muscle activity variables by a device (EMG) and other stage in the fourteenth week, as it was then re-measured associated with the activity electrical variables of rectus femoris muscle. the end of the treatment period was associated with the response of muscle and improved joint case after it has been data collection, extraction has been actively femoris muscle own results in variables (Amplitude, Area and Duration), done statistically process data through statistical pouch (SPSS).

The researchers are found an important point, that the use of physical therapy equipment necessary for a specific period, within the limits of the muscle response, and continue to mean events damage in the muscle, so the use of therapeutic exercises are only way to increase the susceptibility of muscle in contraction and extendable.

Keywords: Rectus femoris, Activity, Rehabilitation and knee joint.

1- Introduction:

What the world is witnessing today offer did not come from the vacuum, but was born according to scientific bases were core to achieve this progress. As the genuine coexistence with type phenomenon to be the cause draws the researcher and the person interested in the agreed range of perceptions and possibilities about differences reasons for the occurrence of such phenomenon, and that the subject researcher phenomenon under investigation to research work and field makes this phenomenon the theory and legally have maximum effect in a scientific progress that seeks him the world today.

The human body naturally installed subject to many of the theories and laws physiological which today mainly relied upon in determining the capabilities physical and skill, and the study of electrical activity to muscular longer scientific means the most accurate in the interpretation of the effectiveness of the work neuromuscular to learn susceptibility contraction muscle concerned relative¹.

The knee joint is one of the more joints common in the world of injuries in general and injury sports in particular², which require going into researches ongoing include various sciences, including physiology and

anatomy ...etc. The researchers are deliberately to study difference between the variation in activity neuromuscular rectus femoris before rehabilitation of the knee joint and after rehabilitation.

Through field observation and after reviewing the scientific sources researchers found that there direct proportion between the amount of muscle strength of the muscles working on the knee joint and the weakness of the joint itself, and the reason for this lies in the injury of the knee joint lead to lack of movement and turn works to double the amount of output power of the muscles working on the knee joint which reduces the rate of healing in the knee joint^{3,4}.

With regard to this aspect, the researchers noted that there is a noticeable impact on the effectiveness of the working muscles on the knee joint⁵, and in light of this deliberately researchers to study the activity of the rectus femoris muscle after rehabilitation of the knee joint.

2- Methods and material :

The research sample included (15) players from (25) players injured and specific than male, suffer from persistent pain in the knee, the result of the training effort for the athletes. Find variables were identified through reconnaissance sample consisted of (2) players injured and through the pilot study results of the surveywe identified the variables.

Offered a sample of the research on the three doctors specialized disease, arthritis, if conducted for the case mentioned clinical examination shows that the players have the pain of stress on the knee joint, and after he was diagnosed by specialists were identified treatment program that includes physical therapy and exercise therapy sessions identified (10) sessions continued to (14) extra session as a result of persistent pain. The researchers conducted the homogeneity of the sample in a changing history of injury (mean 3.88 ± 0.64), the researchers used the device (EMG) of MyoTrace company made in German to measure research variables (Amplitude, Area and Duration).

The measurement according to the allowable range of motion for each person, depending on the injured party from the movement weight after extreme flexion of the knee joint and adopted the researchers measuring the angle (90)⁶, as it reaches torque of the muscle to the extreme grades and here is muscle strength in the maximum productivity of energy⁷. To avoid the side effects that result when a detailed injured knee, the electrical activity of the adoption of rectus femoral muscle were two points of physiological anatomical adopt to measure research variables previously mentioned⁸, it took extended examination of the variables (EMG) for three days, and was measuring the stages of the first stage tribal followed by rehabilitation of the knee joint stage through the prepared program for a period of (10) weeks, then comes the second stage of the re-measurement of research variables previously mentioned, and then followed by holding the qualifying program until the week (14) and immediately after is a final stage of the testing device (EMG). After completion of the measurements and examination of the data from the computer conversion and discharged in the tables for the required statistical processing of the data, the use of statistical pouch (SPSS) and extracted during testing and test variability analysis less moral difference between the above-mentioned tests to see favorable differences in the results.

3- Results:

Table (1): Shows the mean and Std. Deviation to the variables of research which its mean a measurements of rectus femoris activity

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
Amplitude	Pre-rehabilitation	15	219.48	2.96	0.76	217.8372	221.12
	Post10 week	15	265.89	4.3	1.11	263.5181	268.27
	Post14 week	15	228.43	4.71	1.22	225.8225	231.04
	Total	45	237.93	20.72	3.09	231.7095	244.16
Duration	Pre-rehabilitation	15	0.29	0.02	0.005	0.2764	0.3
	Post10 week	15	0.46	0.02	0.004	0.4460	0.47
	Post14 week	15	0.2922	0.022	0.006	0.2800	0.3
	Total	45	0.35	0.08	0.012	0.3203	0.37
Area	Pre-rehabilitation	15	107.54	1.86	0.48	106.5101	108.57
	Post10 week	15	107.62	2.26	0.58	106.3675	108.87
	Post14 week	15	117.76	3.14	0.81	116.0171	119.5
	Total	45	110.97	5.423	0.81	109.3415	112.6

From the table in up there are differences in the mean of variables to the EMG indicators ,but the differences between the tests in Std.Deviation not big, this guide us to the sample of research is hemostatic.

Table (2): Shows the Sum of Squares, Mean Square and F value to the variables of research which it's mean a measurements of rectus femoris activity

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Amplitude	Between Groups	18192.141	2	9096.1	553.2	0.000
	Within Groups	690.594	42	16.44		
	Total	18882.735	44			
Duration	Between Groups	0.276	2	0.14	368.995	0.000
	Within Groups	0.016	42	0.000		
	Total	0.292	44			
Area	Between Groups	1036.166	2	518.083	84.45	0.000
	Within Groups	257.675	42	6.135		
	Total	1293.841	44			

Table (2) shows the value of Sig. is the less of P value (0.05), and this shows a significant difference between the result of the tests in ANOVA test.

Table (3): Shows the multiple Comparisons to the variables of research which it's mean a measurements of rectus femoris activity

Dependent Variable	(I) Tests	(J) Tests	Mean Difference (I-J)	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Amplitude	Pre-rehabilitation	Post10 weeks	46.42*	0.000	49.41	43.43
		Post14 weeks	8.96*	0.000	11.94	5.96
	Post10 weeks	Pre-rehabilitation	46.42*	0.000	43.43	49.4061
		Post14 weeks	37.47*	0.000	34.48	40.45
		Post14 weeks	Pre-rehabilitation	8.95*	0.000	5.96
	Post10 weeks	37.47*	0.000	40.45	34.48	
Duration	Pre-rehabilitation	Post10 weeks	0.17*	0.000	0.1832	0.15
		Post14 weeks	0.006	0.441	0.0198	0.01
	Post10 weeks	Pre-rehabilitation	0.17*	0.000	0.1547	0.18
		Post14 weeks	0.16*	0.000	0.1492	0.18
	Post14 weeks	Pre-rehabilitation	0.006	0.441	.0088	0.02
Post10 weeks		0.16*	0.000	0.1777	0.15	
Area	Pre-rehabilitation	Post10 weeks	0.08	0.932	1.9032	1.75
		Post14 weeks	10.23*	0.000	12.0432	8.39
	Post10 weeks	Pre-rehabilitation	0.08	0.932	1.7472	1.9
		Post14 weeks	10.14*	0.000	11.9652	8.31
	Post14weeks	Pre-rehabilitation	10.23*	0.000	8.3928	12.04
Post10 weeks		10.14000*	0.000	8.3148	11.9652	

The mean difference is significant at the 0.05 level, while the obvious differences did not appear in means between the pre-rehabilitation tests and fourteen week for a variable Duration, as well as with the variable Area did not indicate significant differences in the means in the pre-rehabilitation tests and the tenth week.

4- Discussion :

Through what was shown from the results in Table (1) shows that there are differences in the results between the three circles computational tests for research variables involved measuring muscle activity femoral. The mean differences is evidence of the change in the results of the tests, due to the impact of the rehabilitation program items to the treatment of the fatiguepain in knee joint⁹.

What happened to the response in muscle activity femoral clearly appeared in different of means, as seen from Table (1) that the Std. Deviation between the sample of research in the variables of the (EMG) was not great and that indicates the Std. Deviation of homogeneity between the sample in the type of injury the accuracy of the rehabilitation program to improve the activities of rectus femoris muscle (Fig.1)

Looking at the results table (2), which shows the ANOVA test, we note that there are significant differences were statistically significant, as the moral significance of a value Sig. less than value P value(P=0.05) and this shows the improvement in the results of the tests to the variables of muscular electrical activity of the muscle femoris.

By comparing the results of values between tribal tests and tenth week after the impact of the qualifying program, we found that there are differences between the two tests in the mean computational variables of (Amplitude, Area and Duration), since what has been used exercises increase the balance of muscle work and increased the affected joint stability¹⁰.

The exercises Remember muscular poise reinforce basic detailed in locomotor therapy to improve the ability to maintain the stability knee joint in different kinetic attitudes stability, also note that there is a decrease in the time of muscular activity as a result of the use of device transcutaneous electrical nerve stimulation (TENS), who has worked to reduce the effectiveness of the transition nervous while capacity wave increased in

the tenth week, unlike the fourteenth week, as the wave amplitude decreased while the wave space increased in the fourteenth week when compared with the pre-qualification and the tenth week¹¹.

The use of therapeutic devices may be effective in the first sessions and increase the number of sessions may affect the activity of the muscle passively, and what it is used from the exercises led to increased stability of muscle femoral and maintained a rhythmic harmony between the muscle fibers in question, that the exercises remedial works on the inhibition of the activity of the largest anti muscle, leading to increased muscle strength resulting from energy of muscle during contraction¹². This means that the exercise treatment is more effective in increasing the preprocessing muscle, as the output of the muscle's ability Taken to work interactively between the muscles working and Anti her at work and the efforts of the player as a result of his injury must be of the impact of high to save the stability of the affected joint¹².

The method used in therapeutic exercise characterization relied on exercises decentralization stretching followed by a central shrinking, as the Palace of the length of the muscle at the Research Year and the extension of a few at the rubber happen as is the qualifying factors important to stimulate the motor units and activate Instruct nerve outgoing and incoming reflected spinal and muscular processed The nerve cells. it is worth mentioning that enjoyed by individuals susceptibility mobility necessary to increase the number of active motor units and this is consistent with the results of tests of the tenth week (look table 3).

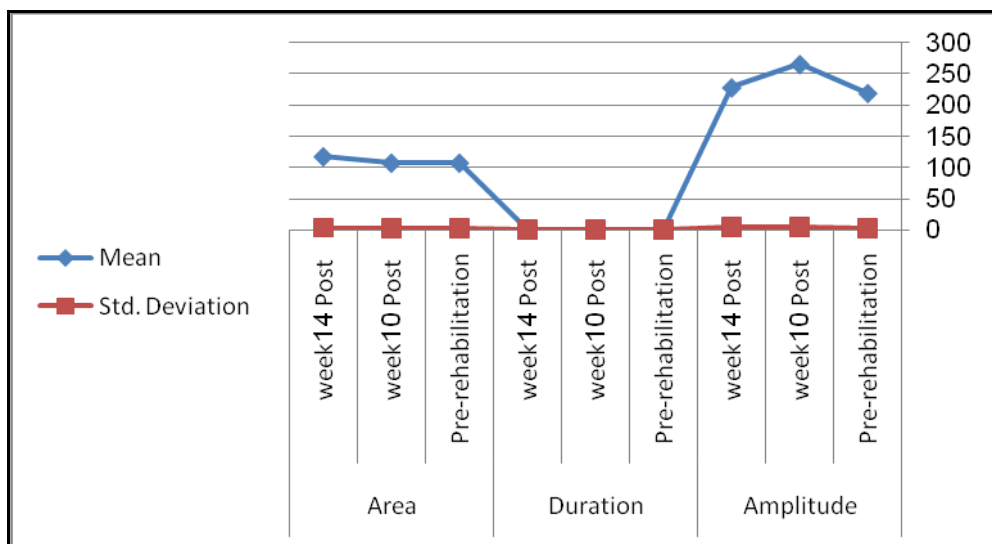


Figure (1): Shows the mean and Std.Deviation todifferences of EMGvariables

5- Conclusion :

The study aimed to control the balance of rectus femoris muscle that have a significant impact on keeping detailed balance of the knee and reduce pain by improving the electrical activity of the voltage of the muscle. The found that the use of the qualifying program is necessary to increase the viability of muscle contraction as well as increase the reaction voltage components of the muscle within the period iPods had to leave the specific physical therapy and therapeutic exercise to continue, mainly treatment.

The researchers found that exercise qualifying was having an impact effective in increasing systolic property after therapy sessions and through the revitalization of the reception of sensory and motor nerve nourishing muscle property, as noted by the researchers reduced reaction voltage of the muscle in the fourteenth week and translated by the wave amplitude variable as a result continue using (TENS) device natural therapy.

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