

Effects of a therapeutic exercise program using a variety of methods for the treatment of infected knee rupture one of two ligament medial or lateral to the Individual sport players

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Introduction and research problem

A lot of players in various sports activities are exposed to many sports injuries during training or public or friendly competitions, which represents the main obstacle to the development of championships sports level, where the development of sports training get muddle and thus obstruct the achievement of the target sports goals.

the psychological aspects of injured player affected by confusion and get more intensity with some conditions, factors and variables, including his championship level and the tournaments or official or international representation he was preparing for, and the degree of injury and the duration of staying away from playground or deprivation of sports practice or representation of the

organization that he belonged to (3: 120)

Many sports injuries scientists recently concluded through scientific research that the percentage of sports injuries has reached 43%: 47% among each (10,000) player, statistic percentages indicating that most of these injuries are in the knee joint. , this high percentage concluded by some research prod physical therapy specialists into paying attention to sports injuries, try to achieve better and faster therapeutic means for the rehabilitation of injured players without losing the whole fitness so that he can complete the training program and achieve the goal of training. (3 : 106), (13 : 75), (15: 113).

The Laterals Ligaments of knee joint is one of the most important sports injuries that occur to players, especially players of Track and Field and

weights lifting as a result of external influence either friction or hit or twist or wrap over the possibility of lower joints flexibility as result of hard training, where knee joint come under burdens outweigh the basic functions of its components thus ligaments particularly internal or external ligaments (medial or brutal) over stretch or spacing of bones of the joint form each other (temporarily) and return again , which result in joint pain and infiltration as a result of pressure on internal or

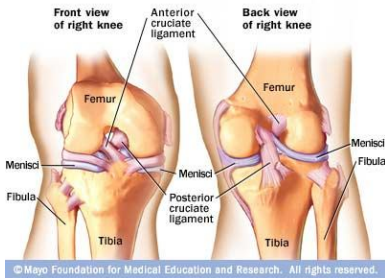


Figure (1) show the normal knee

It is through the researchers experience in the field of sports Injuries rehabilitation they tried after the completion of surgery for the treatment of rupture in the internal or external ligament of the knee joint to find advanced ways and means for the rehabilitation of the knee joint in a properly scientific manner,

external ligaments of the knee. (15: 113)

Osama Riad (1990) mentioning that during physical competition, the injury of the internal or external ligament may be great when flexion knee in acute angle occurs complete ruptured, which leads to severe pain and internal drain , swelling around the knee , the inability to continue in movement, and the instability of the joint or control it. (3: 118)

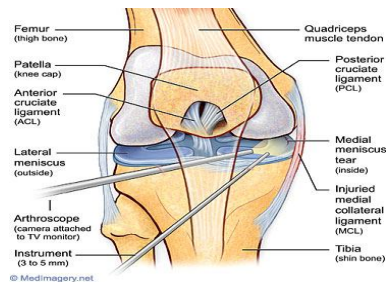


Figure (2) shows the injured knee taking into account the injured player did not loss his full fitness during rehabilitation so he can complete the training program and achieve the goal for which he was trained .

The researchers found through the scientific literature, researches and previous and specialized studies analysis and websites to a combined,

organized and developed series of variety and proposed exercises to rehabilitate internal or external ligament of the knee joint, which are as follows:

- 1- Paraffin wax baths
- 2- Mental exercises.
- 3- Aqueous exercises
- 4- Sandy environment exercises
- 5- Weights exercises.

Paraffin wax: is a composite of paraffin wax with mineral oil by 6: 1 or 7: 1, heated to 40 to 44 degrees Celsius and then painted on the infected part with a brush or dip a towel and then placed on the affected part to keep the temperature of the affected part and reduce the sensation of pain. (16).

Aqueous training: has been known since antiquity and used in the treatment of muscle weakness and palsied limbs due to the properties in buoyancy and resistance, buoyancy allows the body to move easily on land. (12: 23).

The results of studies carried out by kaeray Alskary, Mohammed Jaber Breka (2000), kaeray Alskary, Mohammed Jaber Breka, Youssef Dahab (2001), that the aqueous exercises have a lot of multiple benefits as it used for the treatment and rehabilitation

and achieve full and comprehensive body fitness, It benefits also in increase the flexibility of the joints, and the development of the motor range. (6:14), (7:3)

Sand Exercises: Atef Sayed Abdel Fattah (1999) noted that sand exercises have the physical and physiological multi-benefits where it works on developing individual qualification, also improving the efficiency of the cardio-respiratory system and nervous-muscle system. (10:5)

This is supported by Zaki Mohamed Hassan (2004), Mahmoud Attia Bakhit (1994), quoting from Faria, and Paish that training on sand have many positive physiological effects on body, including the improvement of vital capacity of the lungs, improving aerobic capacity, improve the efficiency of both nervous and muscle systems, and leads to growth and development of all types of endurance, and the overall physical efficiency of the individual. (9: 234), (11: 97)

Weightlifting training: Petrthomson (1996), Talha Hossam El Din, Wafah Salah, Mostafa Kamel, Saeed Abdul Rashid (1997), and Factor (2000) mentioned that the weights training is one of the

main pillars for the development of muscular strength, improve physical level and elevating the level of achievement at various sports activities. (5:27), (8:15), (14: 219)

Weightlifting exercises are also used to treat muscle weakness and sports injuries after the completion of surgical operations because of its positive effects in the development of muscle strength of the injured player and return it to the normal state. (14: 58)

- Research objective

The research aims to design a program of rehabilitation exercises using a variety of methods (paraffin wax bath, mental exercises within the aqueous environment, Sand exercises, exercises using weights), and identify its effect on the treatment of infected knee ligament medial or lateral to the Individual sport players (athletics, weightlifting), through :

- Making electrical stimulation using EMG to check on the electrical muscle activity of Flexor and extensor muscles of the knee joint (measure the strength of the Flexor and

extensor muscle of the knee joint).

- Measure the flexibility of the affected knee joint before and after the qualifying program for the injured player .

- Measure the perimeter of the femoral and twin muscle of the infected leg before and after the qualifying program for the injured player.

- Hypotheses

- There are statistically significant differences between the pre-and post-measurements in EMG activity for Flexor and extensor muscles of the infected knee joint in favor of post-measurements.

- There are statistically significant differences between pre and post- measurement in the flexibility of the knee joint for dimensional measurements.

- There are statistically significant differences between the pre- and post- measurement in the vicinity of the femoral and twin muscle of the infected leg in favor of post-measurements.

Research procedures

Research Methodology

Research methodology requires the use of the experimental method to its suitability for the purpose and procedures of the

research, the researchers also used the experimental design in a pre and post measurement for one experimental group.

Research community:

The research community represented in the injured ligament in the internal or external ligament of weightlifting players - Men at Asswehly Sports Club- city of Misratah Libya.

Research Sample:

sample was selected of athletes and players weightlifters, Asswehly sports club, the injured ligament in the internal or external ligament of the knee, the total sample consists of (3) players, two of whom were infected with partial rupture of the ligament (brutal) of the knee, and the third infected with partial internal ligament (medial) of the knee, the researchers intervened on the second day of a surgical procedure to them.

Foundations of the proposed rehabilitation program

Duration of the proposed rehabilitation exercise program is (16) week, divided into two phases:

First stage: The fixing, the infected knee is fixed inside medical plaster for (4) weeks ,

and this phase aims to strengthen the front and back muscles of the infected leg (ie, the muscles surrounding the knee). This phase is divided into two periods:

- the first period is the fixing phase : duration (7) days, starting from the second day of the surgical operation and where the following exercises are performed:

1- Mental exercises for the normal leg and injured leg.

2- Exercises with assistance, (holding the infected leg of the player to perform some rehabilitative exercises).

The second period of the fixing phase: duration (21) days, starting from eighth day until the end of that stage, and the following exercises are performed

1- Locomotive muscle training (Isotonic exercises)

2- Constant muscle training (Isometric exercises).

Second Phase: called after the fixing, where plaster is disjunction for the injured player, and aims to re-flexibility of the infected knee joint, strengthen the muscles around the joint , the player 's return to his natural condition, give the player full fitness .

Duration of this phase (12) week during it he performed the following exercises:

- 1- Exercises of various resistance.
- 2- Exercises within the aqueous setting.
- 3- Exercises using weights.
- 4- Exercises within the sandy setting.

- The implementation of the proposed rehabilitation program

- Basic pre-measurements were made on a sample on 02.23.2013, by:

- Measure the strength of the Flexor and extensor muscle groups of the knee joint using EMG.

- Measuring the infected knee joint flexibility before the start of the qualifying program.

- Measure the circumference of thigh muscle and twin muscle circumference of the infected leg.

The application of the proposed rehabilitation program

The program applied on the research sample of (3) injured players for a period of (16)

week from 25/03/2012 to 07.16.2013.

Post- measurement of the proposed training program:

* Basic pre- measurements were made on the sample on 07.20.2013,:

- Measure the strength of the Flexor and extensor muscle groups of the knee joint using EMG.

- Measuring the flexibility of the infected knee joint after the finishing the qualifying program.

- Measure the circumference of thigh muscle and twin muscle of the infected leg.

Statistical handling method

- the following statistical methods are used :

- Arithmetic mean - standard deviation

- Statistical differences significant

- Improvement rate

Results presenting

In the light of the statistical handling of research data the researchers provides an overview of the results according to the order of the objectives as follows:

Table (1)

Statistical significant differences and the improvement percentage between pre- and post- measurement in thigh and extensor muscles of the knee joint under study N = 3

Electrical activity of muscle group	Scale	Pre-measure		Post-measure		T value	Improvement rate
Flexor muscle of knee joint	micro volt	96531.5	4517.9	98995.87	4112.15	5.8 ε.۳	3.55%
extensor muscle of knee joint (knee bending)		94236.3	3181.6	97835.21	3789.55		3.82%

T tabular value at level 0.01 = 2.76

It is clear from Table (1) the statistically significant differences between the pre and post-measurement in electrophoresis muscle activity EMG of Flexor and extensor muscles of the knee joint in favor of post -measurement

Table (2)

Significant statistical differences and the improvement ratio between pre-and post- measurement in flexibility of infected knee joint and surrounding muscle circumference N = 3

variables	Scale	Pre-measure		Post-measure		T value	Improvement rate
%۱۳,۹۰	ε,۳۲	۱,۶۷	۰۹۸	۱,۰۴	۰۸۶		Keen flexibility
%۳,۹۸	ε,۲۲	۰,۹۸	ε۱,۸۰	۰,۹۲	ε۰.۲۰		thigh muscle periphery
%۶,۲۹	ε,۹۰	۰,۸۹	۳۲,۲۶	۰,۷۶	۳۰.۲۳		twin muscle periphery

T. tabular value at 0.05 = 2.45

it is clear from Table (2) the statistically significant differences between the pre- and post- measurement in the flexibility of infected knee joint , and femoral muscle circumference in favor of the post -measurement .

Results Discussion

It is clear from Table (1) that there are statistical significant differences between pre-and post- measurement in muscular electrophoresis activity EMG of the Flexor and the extensor muscular of the knee joint in favor of post-measure, where the improvement in the flexors of the knee joint was 2.55 %, and in the extensor muscles of the knee joint 3, 82%, and this proves the validity of the first hypothesis.

Table (2) show the statistical significant differences between pre- and post- measurement in the flexibility of the infected knee joint, and muscle twin perimeter, and femoris muscle perimeter in favor of post-measur , the improvement in the flexibility of the knee joint was 13.95%, and in muscle femoris perimeter 3.98%, and in twin muscle perimeter was 6.29%, and this proves the

validity of the second and the third hypothesis .

The researchers ascribe this improvement as a result of qualifying impact of the program and what it contains of a variety of means of rehabilitation and physical exercises directed to the goal of the program within the parts of the rehabilitation unit.

The results of Kaerea Alsokary, Mohammed Jaber Brika (1998) ,and Nadia Mohamed El Sawy (1995) studies showed that the importance of aqueous exercises in the treatment, rehabilitation and acquisition of fitness. the results of studies carried out by Atef Sayed Abdel Fattah (1999), Zaki Mohamed Hassan (2004) , Mahmoud Attia Bakhit (1994) , Faria, and Paish demonstrated the benefits of sand exercises to improve the biological variables of the body, and the development of the overall physical fitness, and also the results of studies carried out by each of Peter Thomson (1996) , Talha Hossam El Din , and wafaa Salah, Mostafa Kamel, Saeed Abdul Rashid (1997), and Factor (2000) showed the importance of training weights in the treatment of muscle

weakness because of its positive effects in the development of muscle strength of the injured player to be returned to the natural state .

Web site "devices and means of Physiotherapy and Rehabilitation international information network" indicated the importance of paraffin wax to maintain the temperature of the affected area and reduce the pain sensation. And also the importance of mental training during the installation phase of the infected knee to strengthen the surrounding muscles.

The researchers collated the previous means and methods in the series of organized exercise to prepare physical rehabilitation program work on the rehabilitation of the infected player to return back to his normal state and improves a comprehensive fitness as soon as possible , the researchers has achieved the main objective of the research and checkup the stability of the hypotheses as well.

Conclusions

in light of the research results and within the research

sample and from result discussion the researchers concluded the following conclusions:

- the statistically significant differences between the pre and post-measurement in electrophoresis muscle activity EMG of Flexor and extensor muscles of the knee joint in favor of post – measurement

- The statistically significant differences between the pre- and post- measurement in the flexibility of infected knee joint , in favor of the post –measurement

- Statistical significant differences between pre-and post- measurement in muscular electrophoresis activity EMG of the Flexor and the extensor muscular of the knee joint

- the statistical significant differences between pre- and post- measurement in the flexibility of the infected knee joint

Recommendations

Depending on the data and information and guided by the conclusions also within the framework of the research the

researchers recommends following:

Concerning with the design of rehabilitation programs using various exercises as proposed in this research for the rehabilitation of other injuries.

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