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THE EFFECTS OF PHYSICAL THERAPY COMBINED WITH REINFORCING EXERCISE IN POST ARTHROSCOPY FOR ANTERIOR CRUCIATE LIGAMENT

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Abstract

Background: Knee ligament injuries are among the most common sports lesions. However injuries of anterior cruciate ligament are frequent especially in amateur football who does not realize streching muscular before entering in the field.

Purpose: The purpose of this study was to evaluate physical therapy combined with reinforcing exercises post arthroscopy for anterior cruciate ligament

Methods: This is a Pilot Randomized Clinical Trial Study. Patients were divided into two groups .In group A patients (n=5) were underwent a protocol with physical therapy combined with reinforcing exercises, while in group B (n=5), patients underwent only physical therapy. Like outcomes measures included visual analogic scale (VAS) and range of motion was measured with a goniometer.

Results: In group A values were significant for visual analogue scale VAS with (p value < 0, 05) was compared with group B. While degrees of motion in group A were positive for a relatively shorter period than in group B.

Conclusion**:** In the group A which was applied physical therapy combined with reinforcement exercises were efficient results than in group B that was applied only the physical therapy (TENS) in amateur football sports

Keywords: *Anterior cruciate ligament, physical therapy, reinforcement exercises.*

1. Introduction

The knee joint is a complex structure, capable of providing stability and mobility to the human body, functions guaranteed mainly by the bone, ligament and muscle structures that compose this articular complex (p393)[1] In study of Thomanson LC et al (2002) knee ligament injuries are very common and are considered epidemiological in nature, particularly in sports. The anterior cruciate ligament is the ligament most frequently damaged, and the medial meniscus is the most frequently damaged meniscus. In study of Irvine GB et al (1992) was estimated efficiency between anterior cruciate ligament and meniscal injury found that 86% of the patients with anterior cruciate ligament insufficiency had an associated meniscal injury. Existing some

modifiable risk factors have been theorized to play a role in the development and persistence of, including quadriceps weakness, specifically in vastus medialis obliqus (VMO)expressed in studies of Halkjaer-Kristensen J et al, Morrissey MC et al, Perry J et al, Gerber C et al and Vegso JJ et al (1985) hip muscles dysfunction, especially abductors and external rotators foot overpronation generalized joint laxity limb length discrepancy patellar malalignment and patellar hyper mobility and in study of Anderson AF (1989).The treatment for ligament injuries is frequently surgical, standard for this surgery is performance through arthroscopy, a less invasive technique than open surgery and that affords a more accelerated rehabilitation process. After surgical intervention it is important rehabilitation treatment which includes the reduction of pain, elimination of edema, range of motion ROM articular in flexion and extension, muscle strength, proprioception exercises, rehabilitation of gait, climbing and landing stairs. Exist different protocols of rehabilitation of anterior ligament cruciatum such treatment is through physical therapy, cryotherapy, exercise, manual therapy corticosteroid injections. The aim of our study is to determine the efficacy of physical therapy combined with reinforcing exercises for muscle quadriceps.

2. Materials and Methods

2.1 Purpose: The purpose of this study was to evaluate physical therapy combined with reinforcing exercises post arthroscopy for anterior cruciate ligament

2.2 Method: This is a Pilot Randomized Clinical Trial Study was conducted in Fisiomed Clinic for a period of 1 year since May 2016 until May 2017 a Tirana. Patients were divided into two groups. In group A patients (n=5) were underwent a protocol with physical therapy combined with reinforcing exercises, while in group B (n=5), patients underwent only physical therapy. All patients were informed to be included in this pilot study and hiding identity.

2.3.1 Inclusion criteria

- Both sexes
- Especially people who play football
- Adult over 24 years old
- Patient with rupture of anterior cruciate ligament (With or without the touch of the medial meniscus)

2.3.2 Exclusion criteria

- Patient younger than 24 years old
- Patellofemoral pain syndrome
- Patients who have had acute knee joint trauma

2.4 Study Protocol

In the group A was applied physical therapy combined with reinforcement exercises. The protocol was followed on patients was: At first we used TENS therapy was applied with four electrodes for 22 minutes, selecting for three to four weeks the quadriceps muscle strengthening program. After TENS was applied laser therapy with 10 minutes duration in the anti-inflammatory program in the first weeks of treatment and in the next few weeks' lasers for combat scar of arthroscopy. The third physical therapy that was applied to Group A was magneto therapy with a duration of 15 minutes to favor the regeneration of the anterior cruciate ligament and the medial meniscus underlying the artoscopic intervention. This protocol was finalized with initially isometric reinforcement exercises of the vastus medialis and rectus femoralis muscle and over the weeks were applied isotonic reinforcement exercises. In group B, the rehabilitation protocol was implemented only with physical therapy, where three physical therapies were used in group A. Patients underwent physiotherapy for 5 weeks, where in the first 3 weeks the rehabilitation was for 5 days of the week with duration of 90 minutes in Group A and 60 minutes in Group B.

2.5 Outcome measure

We used for measurement of pain intensity used the Visual Analog Scale (VAS) of pain, at the beginning and at the end of all the physiotherapy sessions, in both groups. The evaluation of the knee ROM was executed in degrees, through goniometry using a universal goniometer of plastic material. The knee ROM was evaluated the movement of flexion and extension which are difficult to regain especially during the first week post arthroscopy. To accomplish measurements with goniometer fixed arm remained parallel to the lateral surface of the femur diaphysis in the direction of the greater trochanter, while the center of the goniometer lies in the femoral lateral condile and the mobile arm remained parallel to the lateral side of the fibula in the direction of the lateral malleolus.

3. Results

In the first table are presented all characteristics of the two groups. We consider that the number of participants in both groups is the same N=5, but we notice a noticeable difference regarding age of participant where in group A Mean ± SD is 27,4±4,4 than in group B Mean±SD is 32,2±4, so apparently smaller in group A. We appreciate belongs to the gender in group A are more affected male ,while in group B there is a small difference but dominate female. While regarding the affected limb we notice that in both groups there is the dominance of the right knee.

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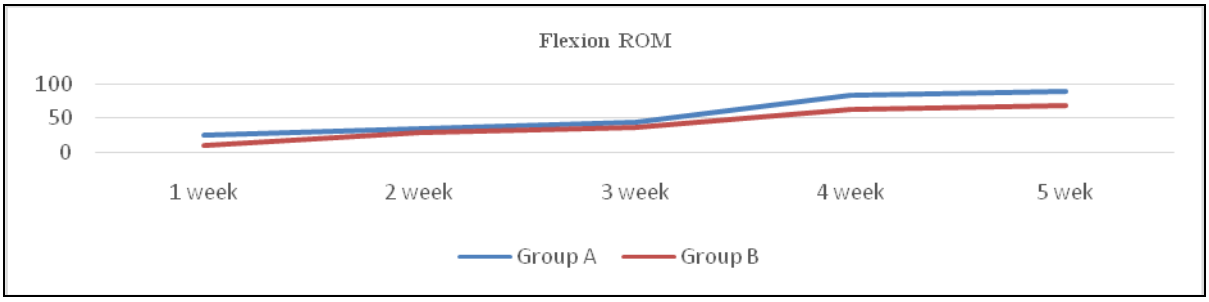
Tab 1 Characteristics Baseline for both groups

Sample	Group A (N=5)	Group B (N=5)
Mean±SD	27,4±4,4	32,2±4
Sexy Male Female	N=4 N=1	N=2 N=3
Affected Limb Right Left	N=3 N=2	N=3 N=2

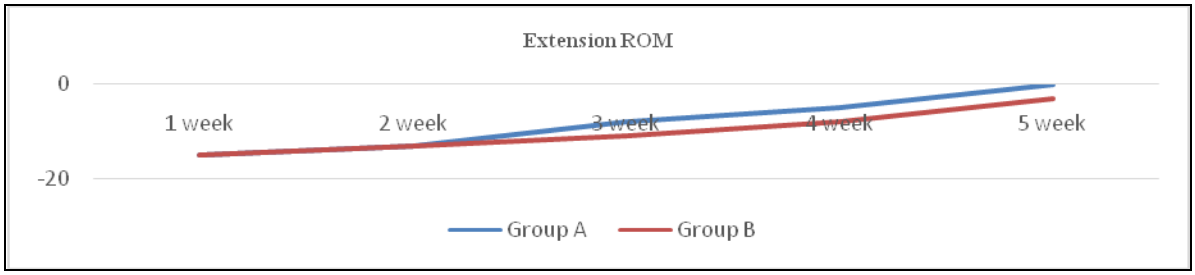
In the First Figure we evaluate the flexion of the knee joint in both groups and in the 5 weeks of the physiotherapeutic rehabilitation protocol. In the group A we notice a noticeable improvement of the movement articulation ROM in the flexion where in the 5th week the patients reach 90 degrees of pure flexion. While in group B we notice having allowed for articulation amplitudes but also after 5 weeks physiotherapeutic program we can not recover to 90 degree in flexion of knee.

Fig 1. Evaluation of flexion ROM in both groups for 5 weeks of rehabilitation



In the second Fig we noticed that the patients in Group A have significantly improved of the ROM and after 5 week of treatment the patients have arrived 0 degree of extension for knee .While in Group B we noticed permitting of the ROM but at the end of the 5 week the patients does not realize a full extension

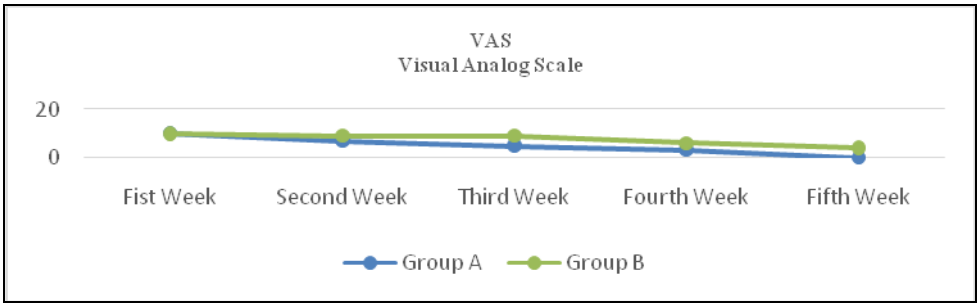
Fig 2. Evaluation of extension ROM in both groups for 5 weeks of rehabilitation



In the third figure we noticed the visual scale of pain , where in group A we see elimination of total pain in the 5 week vas = 0. While in Group B we noticed that the

pain has a significant reduction but in the 5 week the values of Vas are 4 which means the patients still have the presence of a miniature pain during physical activity.

Fig 3. Evaluation of pain with VAS visual analog scale



4. Discussions

The objectives of our study are to evaluate the effectiveness of physical therapy combined with reinforcement exercises post-arthroscopic of the cruciatum anterior ligaments. In the randomized study of Bottoni CR et al(2008), it was evaluated exellent results because between the two groups there was no change in articulation amplitudes. In the systematic review study of Van Grimsuan et al(2010), evaluated the effects of 32 rehabilitation programs on athletes, among which these programs were the application of physical therapies and reinforcement exercises, the results showed that an accelerated protocol was highly effective in knee stability. In the study of Beynnon BD et al (2005) was a prospective study where the rehabilitation of anterior cruciat ligaments was evaluated in two different times, where patients underwent intercourse with a bone patellar tendon – bone graft followed by accelerated rehabilitation, it was noted that patients had the same results in clinical evaluation, in satisfaction, functional performance, we noticed that the rehabilitation protocol was effective in restoring articulation amplitudes and eliminating pain in both groups. In the systematic review study of Aline Mizusaki Imoto et al(2011), the effectiveness of electrical stimulation in the rehabilitation of anterior cruciatum ligaments was estimated, where the conclusions showed that the combination of conventional rehabilitation exercise with TENS electrical stimulation is effective 2 months after intervention in muscle strengthening. While in study of Kelson Nonata Bones Da Silva et (2010) al was case study, patient underwent post-operator rehabilitation of the cruciatum anterior ligaments and resulted that the treatment protocol involving reinforcing exercises and the physical therapy, as in our study was effective in restoring functionality, strength and return to sport. So as in our study even in studies above special attention to physical therapy and strengthening exercises, despite the fact that over time new coherent and effective methods have been introduced.

5. Conclusion

In group A there are significant changes in the elimination values of pain in the vas = 0, we have significantly improved the articulation amplitudes in the flexion and extension movements where at the end of the 5week of rehabilitation the patients achieved the maximal values of the knee articulation amplitudes. So we get results that the combination of physical therapies with reinforcement exercises for quadriceps muscles are effective compared to the only physical therapy use in group B.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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