

MULTIDISCIPLINARY PHYSIOTHERAPY APPROACH TO IMPROVE FUNCTIONAL ACTIVITY AFTER ACL RECONSTRUCTION

Abstract

When there is Anterior cruciate ligament (ACL) tear there is procedure to replace the ligament called Anterior cruciate ligament reconstruction surgery and this kind of ACL injuries are common in activities related to sports where there is sudden stops and changes. There are many protocols for the ACL rehabilitation after ACL reconstruction, among them this study is to compare the general ACL protocol with multidisciplinary physiotherapy

Aim: This study was designed to compare the effectiveness of multidisciplinary physiotherapy approach and general ACL protocol to improve functional activity from pain after ACL reconstruction.

Methods: The experimental study was conducting on 30 post operative subjects of ACL reconstruction and they were divided into 2 groups where group A was treated with ACL reconstruction protocol and group-B was treated with multidisciplinary physiotherapy approach.

Results: This was a greater improvement in VAS score measurement and triple hop test measurement in group B than the group A.

Conclusion: Pain can be reduced and functional activity can be improved by providing the multidisciplinary physiotherapy to the subjects who under went ACL reconstruction surgery

Keywords: ACL reconstruction, polymetric exercise, nueromuscularactivities, functional activity and ACL protocol.

Authors

Dubba Naga Raju

Assistant professor
NRI College of Physiotherapy
NRIAS.

Rajesh Brundavanam

Professor &Principal
NRI College of Physiotherapy
NRIAS

Yaswanth Pokala

Associate professor
NRI College of Physiotherapy
NRIAS

Dasarapu Indrani

Ph.D Scholar
Saveetha University
Chennai.

I. INTRODUCTION

When there is Anterior cruciate ligament (ACL) tear a tear there is procedure to replace the ligament called Anterior cruciate ligament (ACL) reconstruction surgery this kind of injuries are common in activities related to sports where there is sudden stops and changes. Re- construction surgery is the replacement of the torn ACL ligament. The ACL ligament is the strongest ligament present in knee joint and helps in providing stability of the knee. The ACL surgery is of two types which has open surgery and the arthroplasty.^(1,2)The grafts which are used in it are harm strains and pattelar tendon grafts commonly⁽⁸⁾. They will create a tunnel in the tibia and femur and a graft which has been prepared was sent through these tunnels in order to create a new ACL^(3,), “In the final phase of the graft passage the blog plugs are pushed into the femur and into the tibia and the graft is in tension and fixed into the place on both the femur and tibia with a fixation device of choice and the graft allows the recreation of the normal path of the native ACL”⁽⁵⁾. They might use the metal screw to hold the graft I its correct anatomic position which will allow to heal the surrounding bone.^(9,10)Physiotherapy can be given as early as possible⁽⁶⁾. After the rehabilitation^(11,12) patient can get back to the sport he love but it needs lots of hard work, right therapy and right mindset ACL is most devastating and frequent injury in 50% of knee injuries⁽⁷⁾. knee joint injuries are common and stands in the second place after ankle sprain.

50%of the ACL injuries occurs in combination with meniscus articular cartilage or other ligaments. Subjects can also prone to injuries to the bone beneath the bone or to the cartilage surface. In India the most common sports are kabaddi and football according to the studies the kabaddi players had undergone through more damage (220/291) than the football players (144/291)(2). In USA the incidence is 100.00 to 200.00 per year and the ruptures are estimated to range from 30 to 78per 100000 person. In India 86.5% of knee I jury was noted as common (n=814complete, tear =28 and partial anterior cruciate ligament tear=27). In Australia (54%n=81), Jamaica (1%n=22), Malaysia (3%n=4), New Zealand (11%n=16) Singapore (2%n=3)South Africa(10%n=15) United Kingdom(19%n=29).The common spots include soccer, basketball, taekwondo, snow sports, rugby, badminton, hockey, volleyball, miscellaneous. It is important to understand the ACL anatomy and biomechanics it impact treatment decisions.^(18,21).There are 2types of treatment options for ACL which includes non-surgical and surgical treatment. The surgical procedure is usually advised in injuries which dealing with combined injuries. The non-surgical treatment are sometimes helpful in isolated with ACL tears. This study was designed to compare the effectiveness of multidisciplinary physiotherapy approach and general ACL protocol to improve functional activity from pain after ACL reconstruction. It was study is undertaken with to compare the effect of multidisciplinary physiotherapy approach and ACL protocol to improve the functional activity and to reduce pain.

II. METHODS

The experimental study was conducting on 30 post operative patients of ACL reconstruction.The convenient sampling technique was used in the study and subjects were divided into two groups that is group A and group B. The subjects with postoperative ACL surgery patients between age 18 to 45 years which include both males subjects and females subjects were included in the study. The subjects with presence of major musculoskeletal conditions, cardiovascular or neurological conditions and pulmonary conditions limiting in

cognition and mobility were excluded. After receiving an informed consent from patient detailed personal history is taken and history of anthropometric parameters were calculated. Patient were informed regarding the concern form and the prior information is given to the subject regarding the procedure and measures of vas and triple hop test.

1. **Group A:** The reading of vas and triple hop test was taken prior to the treatment. The subjects of group A was treated with general ACL reconstruction protocol with Quadriceps setting, Patellar mobilizations, Ankle pumps, Prone hang/heel prop, Heel slides with band, SLR, Standing hamstring curl, Prone eccentric hamstrings, Hamstring catches, toe-raises, Hip Abduction, knee bends, Wall slides, Bridging for a period of 6 months tests are performed.
2. **Group B:** The reading of vas and Triple hop test was taken prior to the treatment, Group B subjects are treated with ACL injury protocol and multidisciplinary physiotherapy approach which contains proprioceptive neuromuscular facilitation and Poly-metric activities. Both the groups are treated with 5 days per week for a period of 6 months.

III. RESULTS

The data was calculated by using mean and standard deviation where descriptive and inferential statistics were utilized for data analysis to compare the data sets in the groups Paired t test was utilized and to compare the data sets between the groups independent t test was utilized.

Table:1 Group A comparison of pre-test and post-test values of Triple Hop Test and VAS Score

Group A		Mean	Standard Deviation	t Value	P Value
Triple Hop Test (THT)	PRE - TEST	19.53	1.02	15.2895	<0.0001
	POST-TEST	22.20	0.98		
VAS SCORE (VAS)	PRE - TEST	7.98	1.25	18.5699	<0.0001
	POST-TEST	2.98	0.26		

GRAPH-1

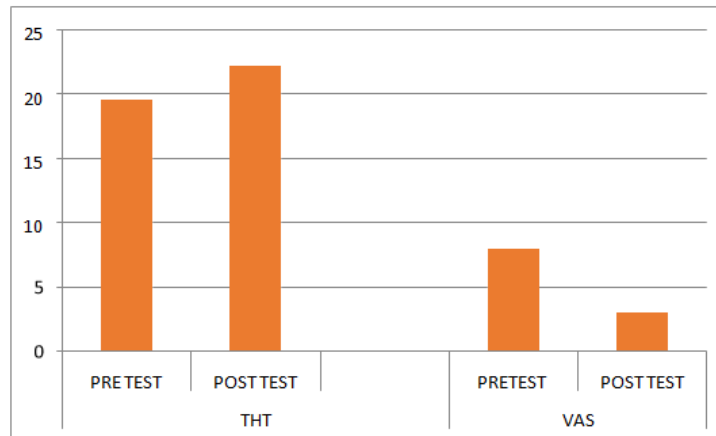


Table:2 Group B comparison of pre-test and post-test values of Triple Hop Test and VAS Score

(Group B)		Mean	Standard Deviation	t Value	P Value
Triple HopTest (THT)	PRE TEST	18.73	1.80	15.6758	<0.0001
	POST TEST	27.00	0.86		
VAS SCORE	PRE TEST	8.79	1.63	18.8753	<0.0001
	POST TEST	1.28	0.89		

GRAPH- 2:

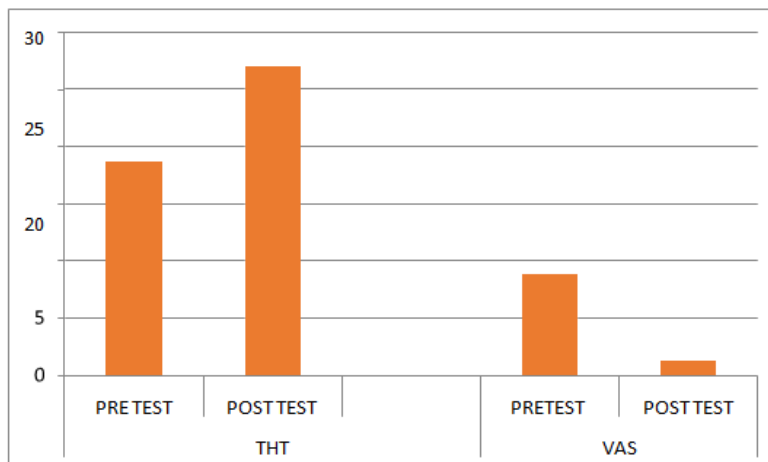
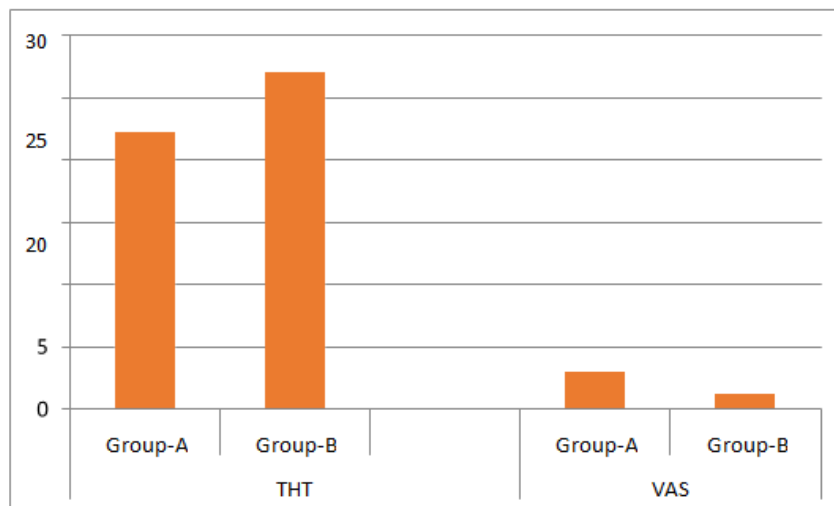


Table 3: Group A and B Comparison of post-test values of THT and VAS score

Post Test		Mean	Standard Deviation	t Value	P Value
Triple HopTest (THT)	Group A	22.20	1.25	1.9980	<0.0001
	Group B	27.00	0.86		
VAS SCORE	Group A	2.98	0.25	1.7889	<0.0001
	Group B	1.28	0.89		

GRAPH 3



From the above statistics done with the data collection procedure quantitative data showed that there was statistical significant difference between the Group A and Group B and in the both groups . The mean value of post test of THT in group A was 22.20 and mean value of post test of THT in group B was 27.00. This showed that the scores of THT in Group B were comparatively higher than the scores of group A where $P < 0.0001$. The mean value of post test scores of VAS in group A was 2.98 and mean value of post-test scores of VAS in group B was 1.28. This showed that the VAS scores in the particular Group B were comparatively lesser than the group A, $P < 0.0001$. Post test vales of statistical analysis for scores of pain and functional activity after ACL Reconstruction showed that the subjects who received Multidisciplinary Physiotherapy approach in Group B had higher improvement when compared with the subjects who received General ACL reconstruction protocol in Group A.

IV. DISCUSSION

The ACL injury is the common structure that undergoes through tear or sprain, it is the strongest ligament^(19,20) in the knee and helps in anterior translation. The ACL injury most commonly seen in athletes which contains sports related to sudden jump and land activities which involve sudden or changes in direction of jumping and landing. The most common games like football, basketball, downhill skiing, soccer. The person itself can hear the pop sound or feels the popping sensation when there is any injury in the ACL. The knee becomes like losing stability and experiences pain while bearing weight. In USA the incidence is 100.00 to 200.00 per year^(21,22). "According to the incidence of ACL ruptures is estimated to range from 30 to 78 per 100000 person". In INDIA 86.8% of knee injury⁽²⁷⁾ (n=814 complete, ACL complete tear 287 and the partial ACL tear was 29. Depending upon the severity of ACL injury the treatment may include rest and rehabilitation exercises^(23,24,25) in order to regain the strength and stability. The person with complete tear undergoes through surgery⁽²⁷⁾ to replace the ligament followed by rehabilitation. The proper protocol will help to decrease the risk of recurrent injury. The current rehabilitation was more advanced with better outcomes than that of 1980s. Where it includes immediate passive movements, partial weight bearing exercises and functional exercise after reconstruction surgery. Though it was aggressive the final reports include the improved muscle strength, early function, great motion of movement. The physiotherapy plays a very crucial role in 3 stages the 1st stage before the injury in order to prevent the risk of injury. The 2nd stage injury to decide whether it undergoes through immobilization phase or conservative stage. The 3rd begin after reconstruction surgery^(28,29). The physiotherapy very important role after the knee injury in order to reduce inflammation, attain good muscular strength, and to avoid atrophy. The rehabilitation involves the quadriceps hamstrings co-activation ratio exercises, the regular program for patellar tendon reconstruction and also the accelerated program. According to the Shelbourne and Nitz in 1990s the patients who under one through the accelerated program rather than conservative program the outcomes are great to that of normal with fewer complications. Hence the rehabilitation not only involves the physical stability but also the psychological components are considered after the reconstruction. As the participants might feel anxiety related to the fear of injury, keeping all these in mind the rehabilitation has a very important role for better strength. According to the severity the physician looks into the type of graft to be used later on according to the study we are considering the patients are taken and were divided into two groups i.e., Group A and Group B. As we already mentioned in the procedure the group A patients are practiced general ACL protocol along with results from the vas scale and triple hop test. The group B patients are practiced by the normal ACL protocol along with the poly-metric and neuromuscular activities and with consideration of the results of triple hop test and the vas scale, all these were started the next day after reconstruction. The present study was to find out the impact of the general protocol to that of the general protocol along with poly-metric and neuromuscular activities according to the statistical analysis the group B subjects shown good progress than the group A.

V. CONCLUSION

In this study a Multidisciplinary physiotherapy Approach to improve functional Activity after ACL Reconstruction in ACL reconstruction patients the result of the study showed that group B with ACL protocol, neuromuscular activities and polymetric activities showed a higher level of positive outcome in terms of decreasing pain and increasing

functional activity when compared to group A with ACL injury protocol in ACL injury patients.

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