

THE IMPACT OF PRE EXERCISE IN PATIENTS WHO UNDERGO ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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ABSTRACT

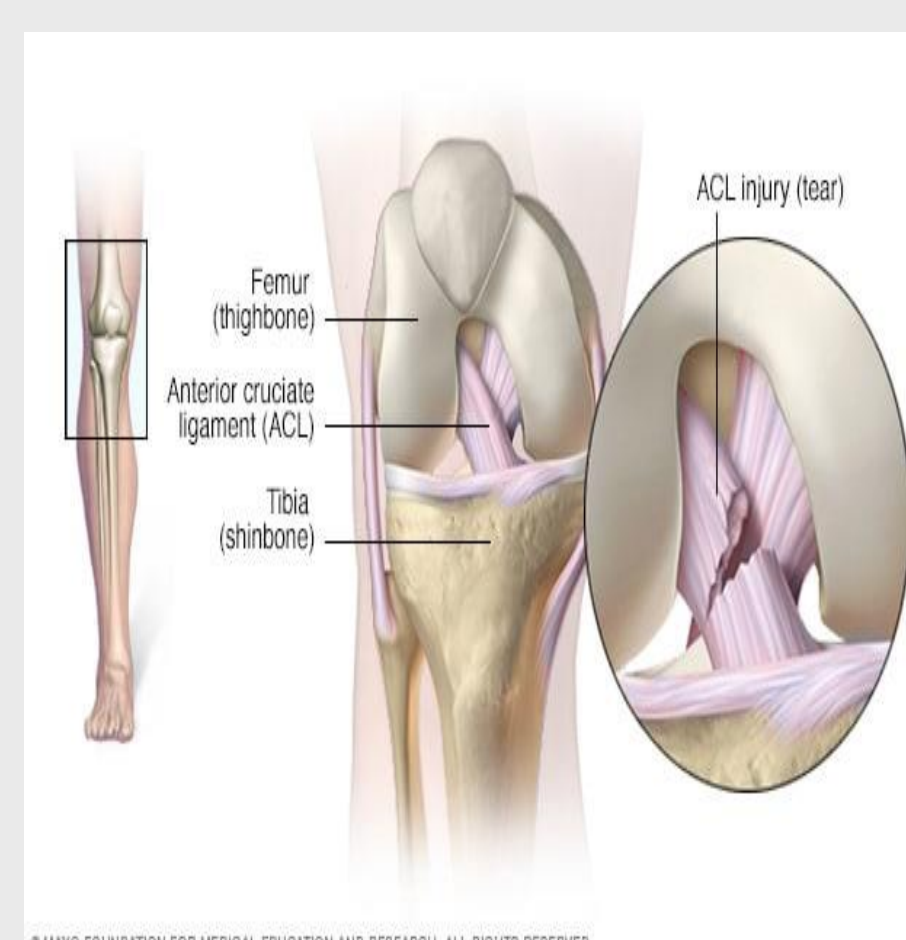
Research question: is there a difference in rehabilitation process after ACL reconstruction between patient who undergone in pre-surgery exercise and those who do not; Null hypothesis (H0): patients who applied pre-surgery exercise especially in lower limb they didn't observe significant difference in rehabilitation process after ACL reconstruction in relationship to patients who didn't apply strengthening program before surgery. Alternative hypothesis (H1): pre-surgery exercise lower limb is beneficial for rehabilitation process in ACL reconstruction in relationship to patients who didn't apply pre-surgeon exercise.

CRITERIA

- ❖ MRI and orthopedic knee assessment that indicate ACL rupture
- ❖ Positive Lachman test
- ❖ Positive drawer test
- ❖ Positive pivot test
- ❖ No other damaged or already repaired knee fracture(meniscus tear, lateral collateral ligament rupture etc.)
- ❖ Ages between 18 and 40 independently if they male or female
- ❖ Place either patellar tendon bone or hamstring tendon auto graft
- ❖ Patients of group b must available 8 weeks before surgery in order to participate the research

METHODS AND MATERIALS

First group (n=40) is the control subject which will not have exercise activity for 8 weeks before operation. Patients will be not prohibited from exercising or engaging in any other typical daily activities but will be requested to keep track of their exercise activity in the weeks leading up to surgery. After, surgery they will follow the same rehabilitation protocol with group b. This protocol is time and criterion based and is divided into six phases. By the end of fourth phase we will conduct the measurements



Second group (n=40) will be named as prehabilitation and the patients will be participated in a 8 week workout program that included supervised strength exercises and balancing exercises, prior to surgery. The plan consists of four workout periods each week, with two supervised gym sessions and two supervised home sessions alternated. The same routine as in the gym will be followed at home, except instead of weights, thera bands with diverse resistance will be used. The program focuses mostly on the quadriceps and hamstrings, as well as proprioception training

Outcomes:

1. Muscle strength of quadriceps and hamstrings is going to be measured by a dynamometer.
2. Measurement of subjective feeling of pain by visual analogue scale (VAS) which is presented as a 10cm line where 0= no pain and 10= worst possible pain
3. Range of motion (ROM) in extension and flexion of the knee will be measured by goniometer in degrees.
4. Thigh muscle mass will be measured through ultrasound.
5. A physical performance test through single-legged hop test is the gold standard for determining thigh functional proprioception status.
6. After 12 weeks it will be assessed their condition by a clinician and see if they meet the criteria to insert at the early return to play phase according to the applied protocol.
7. Each candidate will fill the ACL quality of life questionnaire which is consisted from 31 questions about symptoms and physical complaints, work related concern, recreational and sport activities, social and emotional status and life style.

RESULTS

T test (number)	Dependent variables
1	muscle strength of a)quadriceps and b)hamstrings(measured in Newton by dynamometer)
2	Pain feeling with VAS scale (measure from 0-10)
3	ROM in a)extension and b)in flexion (measured in degrees by goniometer)
4	Thigh muscle mass by ultrasound(measured in cm)
5	Sing legged hop(measured in cm)
6	Return to play (measured in days)

Null hypothesis conclude from all t test state that group a and group b have not statistically significantly difference, regardless the dependent variable each time. So, it is needed a number to confirm or not the null hypothesis statement and that number is p-value. A p-value less than 0.05 (typically ≤ 0.05) is statistically significant. It provides significant evidence against the null hypothesis, as the null hypothesis has a less than 5% chance of being right (and the results are random). As a result, the null hypothesis is rejected, and the alternative hypothesis is accepted. Especially, in this proposal each alternative hypothesis state that group b has better results in comparison to group a for the examined dependent variable respectively.

CONCLUSIONS

Only few high quality research have focused into the benefits of prehabilitation in patients with ACL rupture. Prehabilitation ,with a focus on progressive resistance training and proprioceptive movements, for patients awaiting ACL reconstruction is supported by this research proposal; nevertheless, more research is needed to be conducted before such a statement can be included in ACL rupture guidelines. Psychological variables were among the aspects that could not be taken into consideration in this research. In addition, it could be taken measurements of each individual before and after interventions and compare variations as percentage for its person.

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