HACETTEPE UNIVERSITY
Department of Physical Therapy and Rehabilitation

BODY MASS INDEX AFFECTS KNEE STRENGTH RECOVERY FOLLOWING ACL RECONSTRUCTION

Gulcan Harput, PT, PhD*
Gul Baltaci,PT, PhD+
Ozgur Ahmet Atay,MD*
Hamza Ozer, MD^

- **Hacettepe University, Ankara, Turkey,**
- **+ Private Ankara Guven Hospital, Ankara, Turkey**

^ Gazi University, Ankara, Turkey

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- Ahmet Ozgur Atay: None
- Hamza Ozer: None

Summary

- Body mass index (BMI) greater than 24.9 kg/m^2 adversely affects the knee muscle strength recovery following ACL reconstruction.
- Delayed recovery of the knee muscles due to higher BMI may be a risk factor for degenerative changes in long term after surgery.

Background

- Lower BMI has been shown to a predictive factor of early return of pre-injury level after ACL reconstruction.
- There is no study in the literature to show how BMI affects knee muscle strength recovery following ACL reconstruction.

Purpose

- The aim of this study was to compare knee muscle strength recovery at first, second, third and six months after surgery between ACL recontructed patients whose BMI was greater than 24.9 kg/m^2 and whose BMI was normal (BMI:19-24.9 kg/ m^2).

Material-Methods

- Sixty-seven patients who had ACL reconstruction by using hamstring tendon autograft
- **Patients were divided into two groups according to their BMI.**
- Group 1 (n=34) = normal BMI levels (19-24.9 kg/m^2)
- Group 2 (n=33) = higher BMI levels (>24.9 kg/m^2)

Material-Methods

- Isokinetic dynamometer was used to **measure isometric, concentric and eccentric strength of quadriceps and hamstring muscles**.
- Isometric strength was measured at 1st ,2nd ,3rd and 6th months after surgery.
- Concentric isokinetic test at 60˚/s and 180˚/s & eccentric isokinetic test at 90˚/s were performed at 6th months after surgery.
- Student t test was used for statistical analysis

Results

Isometric Strength

- There were significant differences between groups in isometric quadriceps and hamstrings strength at

  -first (quadriceps: p=0.04)

  -second (quadriceps:p=0.04, hamstrings:p=0.01)

  -third (quadriceps:p=0.02,hamstrings:p=0.004)

  -sixth month (quadriceps: p=0.005, hamstrings:p=0.01)

- Group 1 had greater isometric quadriceps and hamstring strength following surgery when compared to the Group 2.

Results

Concentric and Eccentric Strength

- Significant differences between groups in concentric strength of quadriceps and hamstring muscles

  -at 180˚/s (quadriceps: p=0.002, hamstrings: p=0.004) -at 60˚/s (quadriceps: p=0.002, hamstrings: p=0.008).
- Eccentric strength of the muscles were significantly different between groups (quadriceps: p=0.001, hamstrings: p=0.02).
- Concentric and eccentric strength of quadriceps and hamstring muscles were greater in Group 1 compared to the Group 2.

Results

Isokinetic Testing (kg/m2)	Group	Involved	Uninvolved	I/UI
180 ˚/s Con Ext	Group 1	1.76± 0.5	1.98±0.3	87.9±16.4
	Group 2	1.27± 0.38	1.80± 0.28	70.6± 17.5
60 ˚/s Con Ext	Group 1	2.35± 0.75	2.75± 0.42	84.5± 18.8
	Group 2	1.66± 0.51	2.37± 0.31	69.5± 17.0
180 ˚/s Con Flex	Group 1	1.47± 0.22	1.49± 0.21	100.2± 13.1
	Group 2	1.20± 0.32	1.30± 0.26	91.8± 9.4
60 ˚/s Con Flex	Group 1	1.77± 0.30	1.87± 0.27	95.7± 13.4
	Group 2	1.47± 0.36	1.64± 0.28	89.8± 15.9
90˚/s Ecc Ext	Group 1	2.76± 0.99	3.34± 0.88	83.4± 20.3
	Group 2	1.95± 0.61	2.49± 0.59	78.9± 20.6
90˚/s Ecc Flex	Group 1	1.92± 0.43	2.17± 0.50	90.2± 15.8
	Group 2	1.66± 0.37	1.84± 0.39	91.9± 18.0

Discussion

- This study showed that BMI greater than 24.9 kg/m^2 adversely affected the knee muscle strength recovery following ACL reconstruction
- Delayed recovery of the knee muscles due to higher BMI is thought be a risk factor for degenerative changes in long term after surgery.
- ACL reconstructed patients should be aware of this risk and weigth loss should be recommended for those patients.

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