require rapid force production, yet this deficit in muscle power is rarely addressed in exercise therapy. Therefore, it is essential to emphasize both hip strength and power in the rehabilitation of women with patellofemoral pain to achieve more favorable medium- and long-term outcomes.

Keywords: Rate of torque development, anterior knee pain, women

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ANALYSIS OF SPATIOTEMPORAL GAIT VARIABLES IN PATIENTS UNDERGOING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: A LONGITUDINAL STUDY

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Background: Anterior cruciate ligament reconstruction (ACLR) aims to restore knee stability. However, there is limited knowledge regarding the evolution of spatiotemporal gait variables in the first postoperative months, which is crucial for optimizing exercises protocols.

Objectives: To identify spatiotemporal gait differences between the preoperative period and 15, 30, and 60 days after ACLR.

Method: A longitudinal study was conducted with participants undergoing ACLR, followed by up to 60 days of physical therapy. Gait was assessed using GAITRite® in the preoperative period and at 15, 30, and 60 days postoperative (PO). Single support, double support, swing phase, and stance phase were analyzed using the generalized estimating equation model with specific syntax and the Bonferroni post hoc test in SPSS®, with a 5 % significance.

Results: Sixteen participants were evaluated (13 men and 3 women), with a mean age of 26 year (SD = 7.57), weight of 82 kg (SD = 17), and height of 1.72 m (SD = 0.89). Comparison between the ACLR and control limbs revealed significant differences at PO15: single support ($P < 0.005$), swing phase ($P < 0.009$), and stance phase ($P < 0.009$). In the ACLR limb, differences were found in single support between preoperative and PO15 ($P < 0.0001$) and PO30 ($P = 0.021$), as well as between PO15 and PO30 ($P = 0.001$). For double support, significant differences were observed between preoperative and PO15 ($P < 0.0001$), PO30 ($P < 0.0001$), between PO15 and PO30 ($P < 0.0001$), PO15 and PO60 ($P < 0.0001$), and PO30 and PO60 ($P < 0.0001$). The swing phase showed differences between preoperative and PO30 ($P = 0.010$) and between PO30 and PO60 ($P < 0.0001$). In the stance phase, differences were observed between preoperative and PO30 ($P = 0.012$) and between PO30 and PO60 ($P < 0.0001$). In the uninjured limb, differences were found in single support between preoperative and PO30 ($P = 0.007$) and PO30 and PO60 ($P < 0.0001$). For double support, differences were observed between preoperative and PO15 ($P < 0.0001$), PO30 ($P < 0.0001$), between PO15 and PO30 ($P < 0.0001$), and PO15 and PO60 ($P < 0.0001$). PO30 was different from PO60 ($P < 0.0001$). The swing phase indicated differences between preoperative and PO15 ($P = 0.001$) and PO30 ($P = 0.016$). PO15 was different from PO30 ($P = 0.003$) and PO60 ($P = 0.001$), and PO30 was different from PO60 ($P = 0.006$). In the stance phase, significant differences were found between preoperative and PO15 ($P = 0.001$), PO30 ($P = 0.015$), between PO15 and PO30 ($P = 0.003$), PO15 and PO60 ($P = 0.001$), and between PO30 and PO60 ($P = 0.008$).

Conclusion: On PO15, the ACLR limb exhibited lower single support, a longer swing phase, and a shorter stance phase. Additionally, at PO15, single support was lower, and double support was greater. In the uninjured limb, at PO15, double support and stance phase were greater, while the swing phase was shorter. At PO30, the ACLR limb showed a decrease in single support.

Implications: There are significant differences in gait between the two lower limbs up to 60 days after ACLR, emphasizing the importance of targeting exercises strategies for each phase of the gait cycle and physical function.

Keywords: Anterior Cruciate Ligament Reconstruction, Gait Analysis, Postoperative Period

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SIMULATION MODELING ANALYSIS FOR PREDICTION OF QUALITY OF LIFE AFTER NEUROMUSCULAR TRAINING FOR HIP OSTEOARTHRITIS

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Background: Neuromuscular training in hip osteoarthritis is a promising approach to improve quality of life, pain, and functional performance, but few studies use statistical methods to predict clinical evolution of these patients. Simulation Modeling Analysis (SMA) allows the application of time series analysis in small samples, identifying individual patterns of response to treatment. This approach can optimize physical therapy interventions and become a relevant tool in hip osteoarthritis treatment.

Objectives: To predict values and verify differences in quality of life for a patient with hip osteoarthritis undergoing neuromuscular training, using SMA. Additionally, to evaluate pain intensity, functional performance, and muscle strength before and after neuromuscular training. Method: Case study with a male patient (59 years, BMI: 32.2 kg/m^2) diagnosed with advanced hip osteoarthritis. Quality of life was assessed by WOMAC, pain by Numerical Pain Scale (NPS), functional performance by Timed Up & Go (TUG), and 30-Second Chair Stand (30STS) tests, and muscle strength by maximum isometric dynamometry. Treatment followed an adapted neuromuscular training protocol (NEMEX-TJR), with 26 sessions of 50 minutes over three months. Statistical analysis included descriptive analysis of variables (pain, functional performance, and muscle strength) and time series analysis for WOMAC data. Bootstrapping was used to estimate autocorrelation coefficients based on lags. Correlation values and slopes were also calculated. Statistical significance was set at 5 %. Results: SMA analysis demonstrated a significant prediction of continuous improvement in quality of life with neuromuscular training, with an estimated reduction of 1.28 points on WOMAC per week. After neuromuscular training, there was a global improvement of 61.9 % in quality of life and 100 % reduction