Context: Postoperative knee stiffness following anterior cruciate ligament reconstruction (ACLR) can contribute to an unnecessarily prolonged rehabilitation course. Pain-associated reflexive muscle guarding has been observed in ACLR cases inhibited in their range of motion (ROM) recovery.

Objective: To determine if differences existed in the neuromuscular stretch reflex and psychological factors of pain perception and anxiety between postoperative ACLR patient groups of a protracted and normal course of ROM recovery.

Design: Cross-sectional sixth-week postoperative design.

Setting: Biokinetics Research Laboratory.

Patients or Other Participants: 44 volunteer participants (age, 25 ± 4.1 years; gender, 26 males, 18 females) consisting of ACLR patients and noninjured controls. The ACLR participants (same surgeon and rehabilitation protocol) were categorized into a slow recovery group (SRG: > 6 weeks to recover 0-125˚ knee flexion [n = 10]) and a normal recovery group (NRG: < 6 weeks to recover 0-125˚ knee flexion [n = 12]). The control group participants (n = 22) were age, gender and athletic activity level-matched to the surgical participants.

Interventions: Neuromuscular testing consisted of 2-D video kinematics of the Wartenberg Pendulum Test determining lower limb stiffness indices and electromyography-monitored patellar tendon tap reflex responses. Psychological and health status assessments consisted of the State-Trait Anxiety Inventory and SF-36™ Health Survey.

Main Outcome Measures: Lower limb stiffness and damping coefficients, neuromuscular response (reflex latency, normalized patellar tendon reflex response), pain perception, anxiety scores, and SF-36™ indices. Statistical analyses consisted of 3 (group) x 2 (leg) analysis of variance (ANOVA) and 1 x 3 group ANOVA with significance set at p ≤ .05.

Results: Stiffness and damping coefficients, neuromuscular reflex profiles, pain, anxiety and SF-36™ indices were not significantly different between the surgical groups. The SRG and NRG had significantly greater pain levels (27%, 2.67±2.27; P<.01) and (15%, 1.49±1.15; P<.01), respectively, than the control group. SF-36™ indices were significantly lower for the SRG (18-46%, 546.55±94.70; P<.01) and NRG (19-46%, 577.57±125.58; P<.01) than the control group for total score, function, physical, social, and emotional subscales. The SRG (14%) and NRG (17%) exhibited significantly less damping (.6075±.4667, .4392±.1563; P=.049, respectively) than the control group.

Conclusions: Neuromuscular reflex responses, pain, and anxiety are not distinguishing factors for ROM recovery between the SRG and NRG at the 6th postoperative interval. Pain and decreased SF-36™ indices are clinically relevant factors distinguishing and affecting postoperative ROM recovery rate. Interventions to control pain should be considered to facilitate ROM recovery in ACLR patients and avert development of arthrofibrosis delaying return to athletic activity.

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