

Keywords: Assessment posture; Kinemetry; Anterior cruciate ligament

Introduction

The anterior cruciate ligament (ACL) can be easily torn, causing a significant functional loss in the skeletal muscle system. It is estimated that approximately 70 thousand ligament reconstructions occur annually in the United States [1,2]. It occurs due to the heavy load sustained by the knees and the fact that they are situated between the two body's longest levers, making this ligament especially susceptible to injuries [3]. The ACL is characterized as a static stabilizer for the femorotibial joint. Individuals with such injury exhibit significant biomechanical changes that influence the performance of the reflex responses, which decrease the action of the knee extensor muscles and facilitate the action of the flexor muscles [4,5].

The postural alignment and its synchronicity are interdependent from the harmony of other adjacent systems, mainly the association of the visual stimuli, proprioceptive sensitivity and the vestibular apparatus. Its synchronicity is interdependent from the harmony of other adjacent systems [2]. It is characterized by the homeostasis state and balance, and its maintenance generates the smallest energy expenditure of the muscles, in order to protect the body from traumas, with the support basis and the center of gravity in the vertical. The homeostatic imbalance is characterized by the body attempt to readjust the muscle chains in a way to compensate, and consequently, to preserve the body of trauma [6].

The better postural alignment is characterized as the position of certain body segments capable of allowing a good alignment of the center of gravity favoring the maintenance of this posture by

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injury by modifying the ligament proprioception, individuals with this

software version 1.36, with references to the areas in the shoulder, scapular positioning and inclination angle. Final scores were statistically analyzed by SPSS for Windows 19.0 (SPSS Inc.; Chicago, IL, USA) and by the Student's t-test for independent groups ($p < 0.05$).

Results

A small change was observed between the groups in using the visual postural evaluation with no significance (Table 1). In the computerized biophotogrammetry, some postural change was found between the groups in the region of shoulders, left elbow and scapulae. The results were significant only to right and left shoulder ($p < 0.05$) (Table 2).

Discussion

Following ACL reconstruction, the patients seek to return to their normal functional condition and to avoid the presence of joint laxity, loss of knee extension and joint degenerative pathologies [12].

The anterior cruciate ligament is related with the knee proprioception; however, several studies report that individuals with ligament reconstruction do not exhibit impaired proprioceptive arising from this ligament in patients evaluated after two years of reconstruction. However, individuals presented proprioceptive changes at one month after surgery [13].

For proper maintenance of body posture, the exteroceptive muscular structures, including the proprioceptive and mechanoreceptive ones, need to function in a satisfactory manner to detect potential problems in the skeletal muscle system [6].

The evaluation of postural changes is an essential tool for healthcare professionals as it reveals the individual's adaptation to the treatment, which can determine a correct intervention, and therefore, provide a faster recovery and prevent the occurrence of functional impairment of the skeletal muscles.

Among the screening tools, the New York Posture Rating is used to

assess the static posture comparatively and quantitatively in a specific rating chart to define the individual's alignment of body segments [14,15].

Computerized biophotogrammetry is being used to assess posture due to its advantages and effectiveness in clinical application. Some of the advantages include: low cost in photo interpretation and imaging system, high accuracy and reproducibility of results, no contact with the individual and use of visible light. These are non-invasive methods for quantitative evaluation, which provide criteria for planning and monitoring the interventions (Figure 2) [10].

In this study, the groups presented postural changes predominantly in Group II –ACL. This fact may have occurred primarily because the postural alignment is an association between the visual stimuli, proprioceptive sensitivity and the vestibular apparatus. Its synchronicity is interdependent from the harmony of other adjacent systems such as the stomatognathic system. Loss of function in any of these systems can lead to balance deficits and affect the individual's postural awareness through afferent stimuli [5].

This study does not corroborate with Howells et al. [9], which affirmed the existence of postural abnormalities in patients with moderate ligament, due to reduced proprioception found in the knee

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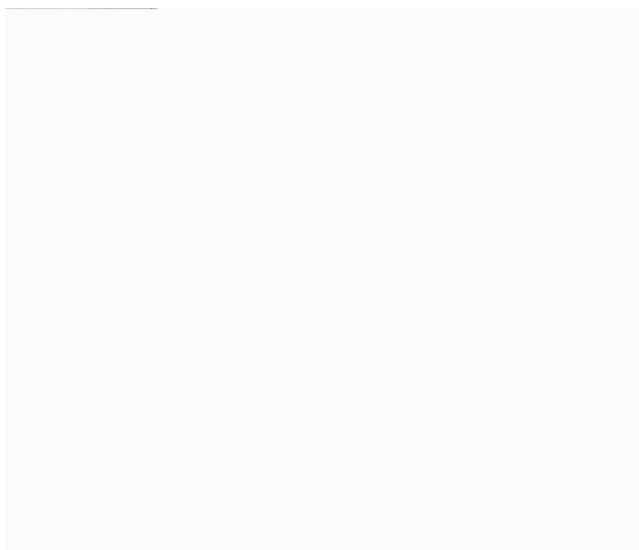


Figure 2: