

Effects of a Specific Stretching Protocol for the Treatment of Achilles' Tendon Chronic Pain caused by Muscle-tendon's Stiffness

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ABSTRACT

Purpose of the study: The present study was aimed to investigate if a specific lower limb's stretching protocol could benefit on Achilles' tendon (AT) chronic pain caused by muscle-tendon (MT) stiffness in NCAA D1 men soccer players during the in-season period.

Hypothesis: It was hypothesized that a specific stretching protocol could benefit on D1 men's soccer players that have been experiencing AT's chronic pain for the previous period of activity through the enhancement of superficial backline (SBL) myofascial chain's compliance levels.

Methods: Twenty-four NCAA D1 men soccer players, from age 18 to 25, were included in the study and randomly assigned to an experimental group (n = 12) and a control group (n = 12). A 6-week stretching protocol with focus on the enhancement of lower limb's posterior kinetic chain compliance levels was built for members of the experimental group.

INTRODUCTION

- Soccer activity was considered demanding for athletes due to the high number of high-intensity activities part of the game (Stolen, 2020).
- NCAA D1 soccer showed particularly high workloads concentrated in a short period of time (Sams, 2020).
- High amounts of stretch-shortening cycle actions were found to cause the increase of muscle stiffness, altering AT's absorption and release of energy (Schepisis, 2002).
- Altered AT's mechanics due to MT stiffness can lead to overuse injuries, causing chronic pain Krause, 2016).
- Stretching was found to be a critical strategy in order to re-enhance normal MT compliance levels and lower chronic pain feelkings (Gallucci, 2014).

METHOS

Inclusion criteria

- NCAA D1 men's soccer athletes, age 18-25.
- Gradually evolving painful condition related to AT structure during the first part of the in-season period.
- No lesions nor irregular fibers orientation confirmed by ultrasonography exams performed to the interested area.
- No previous AT rupture or surgery.

Assessed variables

- MT stiffness: assessed manually on every player by the same examiner and through the performance of the Passive Streight Leg Raise test and the Half-Kneeling dorsiflexion test.
- Pain feeling: recorded twice a day, after wake and after practice sessions, adopting the Visual Analogue Scale with scores ranging from 0 to 100.

Procedure

- Experimental (n=12) and control (n=12) group.
- 6-week stretching protocol to be performed 5 days/week.
- Assessment of variables on week 0, 3 and 6: Passive Straight Leg Raise test and Half-Kneeling dorsiflexion test.

Data analysis and materials

- t-test analysis: Passive Streight Leg raise test's results and VAS100 scores.
- Spearman analysis: Half-Kneeling dorsiflexion test's values.

OPERATIONAL DEFINITIONS

Stiffness: degree of elongation of a tendon structure in response of an applied force, influent on force storage and release mechanics.

Superficial Backline (SBL): mechanically active tissue that builds the lower limb's posterior kinetic chain connecting plantar fascia, AT, triceps surae and hamstrings structures.

Visual Analogue Scale (VAS100): measuring instrument used to numerically evaluate the severity of a pain condition; numerical values scores range from 0 to 100.

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