

THE EFFECT OF DURATION OF KINESIOLOGY TAPE APPLICATION ON ENDURANCE OF VASTUS LATERALIS DURING AN ISONTONIC FATIGUING KNEE FLEXION/ EXTENSION EXERCISE

En-Yi Wu and Naira Campbell-Kyureghyan, PhD
Bioengineering, Imaging and Testing Laboratory (BITL)
College of Engineering and Applied Science
University of Wisconsin-Milwaukee

ABSTRACT

Background: Despite controversy in the scientific literature regarding the effectiveness of kinesiology tape (KT), there is a universal belief in the general population about its “miracle” effect for enhancing performance. Previous studies were limited to short-term KT application and only a few have looked at muscle oxygenation (rSO₂) levels. The goal of this study was to investigate the effect of KT application duration on Vastus Lateralis (VL) muscle endurance during fatiguing isotonic knee flexion/extension exercise.

Methods: Fourteen male subjects (20–25 years, 72.2±2.0 in, 168.7±22.5 lbs) participated in 6 testing sessions, each 24 hours apart. Subjects performed an isotonic knee flexion/extension exercise using a Biodex system and rSO₂ levels of VL were measured using a near infrared sensor. Time to fatigue (TTF) was determined from the time the subject started to when they could no longer perform knee extension/flexion. KT was applied to one knee joint on day 2 of the study and remained applied for 5 days; the second leg was kept as a control. Day-to-day comparisons were performed for TTF, rSO₂ levels and time to minimum rSO₂ level. One-way ANOVA was used on the factor of days of KT application with the significance levels defined by p-values < 0.05.

Results/Conclusion: Variation in TTF changes over time ranged from 48.9% decrease to 67.5% increase with no statistical significance (p>0.05) for both legs. No statistical significance (p>0.05) was found with respect to changes in minimum treatment leg rSO₂ levels, which ranged between -16.1% to 23.3%, or in time to minimum rSO₂ (-58.3% to 50%). Similar trends were found for the control leg. The results of this study indicate that duration of KT application to the knee joint has no significant effect on endurance or delay of fatigue in the VL muscle in healthy subjects during an isotonic knee flexion/extension exercise.

Keywords: Kinesiology tape, duration, knee extensor, muscle fatigue

INTRODUCTION

Manufacturers claim that kinesiology tape (KT) is capable of improving a joint’s range of motion, decreasing the pain from joint injury, and improving muscle function [1]. KT is popular among athletes, recreational users, and individuals with pathological pain, yet the effectiveness of KT and its plausibility is still to be determined.

Anecdotal evidence has drawn researchers to investigate the impact of KT on performance of healthy subjects since manufacturers claimed the performance enhancement is also valid on subjects with no injury. Studies have researched the effect of KT application on performance after immediate application to the knee joint of subjects with no knee injury history [2-6]. However, no research has investigated performance enhancement beyond 24 hours of KT application. In addition to the fact that there is no consensus within the scientific literature on the effectiveness of KT, the factors responsible for biological plausibility and dose response are still to be investigated.