

Muscular Pain & Kinesio® Taping

The Effect of Kinesio Taping® on Muscular Micro-Damage Following Eccentric Exercises

Nosaka, K. (1999). The Effect of Kinesio Taping® on Muscular Micro-Damage Following Eccentric Exercises. 15th Annual Kinesio Taping International Symposium Review. (pp. 70-73) Tokyo, Japan: Kinesio Taping Association.

Introduction

Recently, Kinesio Taping® has been used for reducing pain related to musculo-skeletal injuries, this has led to its frequent use in many exercises and sport related scenes. It has also been thought that Kinesio Taping® could improve sports performance based on muscular functions.

If you do an inexperienced or unpracticed exercise, a few hours after doing that exercise you will experience a severe muscular pain (Delay Onset of Muscle Soreness = DOMS) and lowering of the muscle function. If Kinesio Taping® were effective, it would prevent and efficiently improve pain relief, strength loss, and enzymatic activities.

The purpose of this study was to apply an eccentric exercise to the brachium flexor group in order to cause a delay onset of muscle soreness (DOMS). The study would compare the difference of the DOMS effect, with and without Kinesio® Tape applied to the skin.

Subjects

Twelve male students who had never been involved in any resistance training program were used as subjects (The mean age, height and weight were 20 ± 1.8 years old, 169.9 ± 6.0 cm, 58.8 ± 6.3 kg.)

Procedure

The subjects performed an eccentric resistance exercise on a modified arm curl machine. Subjects had their elbow joint in a 90 degree angle where they could maximally resist. From there, the subject's elbow was forcibly extended to a position where the elbow joint angle was approximately 180 degrees. Each eccentric resistant exercise lasted 3 seconds in duration, and was repeated every 15 seconds with a total of 24 maximal eccentric resistant exercises being performed. The study was divided into two sessions of testing with each session lasting five consecutive days and with two weeks in-between each session. In the first session, the subjects were randomly selected in equal numbers to be tested with Kinesio® Tape applied to the biceps and the brachium during the exercise, and without Kinesio® Tape applied during the exercise. In the second session, the group of subjects that had Kinesio® Tape applied during the first session, were tested without tape, and vice-versa for the non-taped subjects during the first session. During both session the subjects same arm was tested and no information on what Kinesio® Tape would do as an effect was given to the subjects.

The difference of the maximal isometric force (MIF) for the elbow in a 90 degree angle, range of motion (ROM) of the elbow joint, the pain scale (during extension, flexion, and pressure), circumference of the brachium (4 areas in length from the elbow joint 5, 7, 9, & 11cm were measured), plasma levels of creatin kinase (CK) from the blood, and an ultrasound diagnoses (using a B mode ultrasound device to measure muscle thickness and signal intensity of the brachium flexor group) was compared between the two groups.

The changes of measurement based on time (in days) were recorded onto a dual disperse graph with the tape on (T = Treatment with tape) and without the tape (C = Control). An acceptable standard for each measurement was based on a variance of 5% or less.

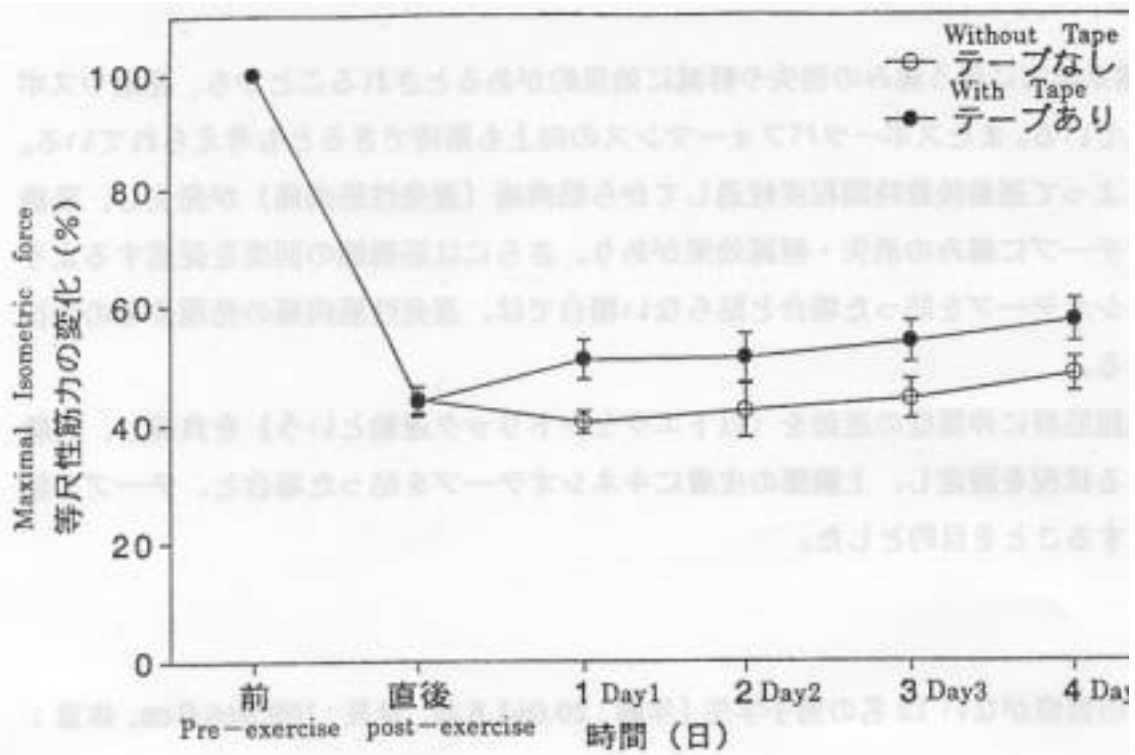


図1：上腕屈筋群等尺性筋力の変化におけるキネシオテープを貼った場合（テープあり）と貼らなかった場合（テープなし）の比較

Fig1: The change of Maximal Isometric Force compared subject with Tape and without Tape

Graph 1

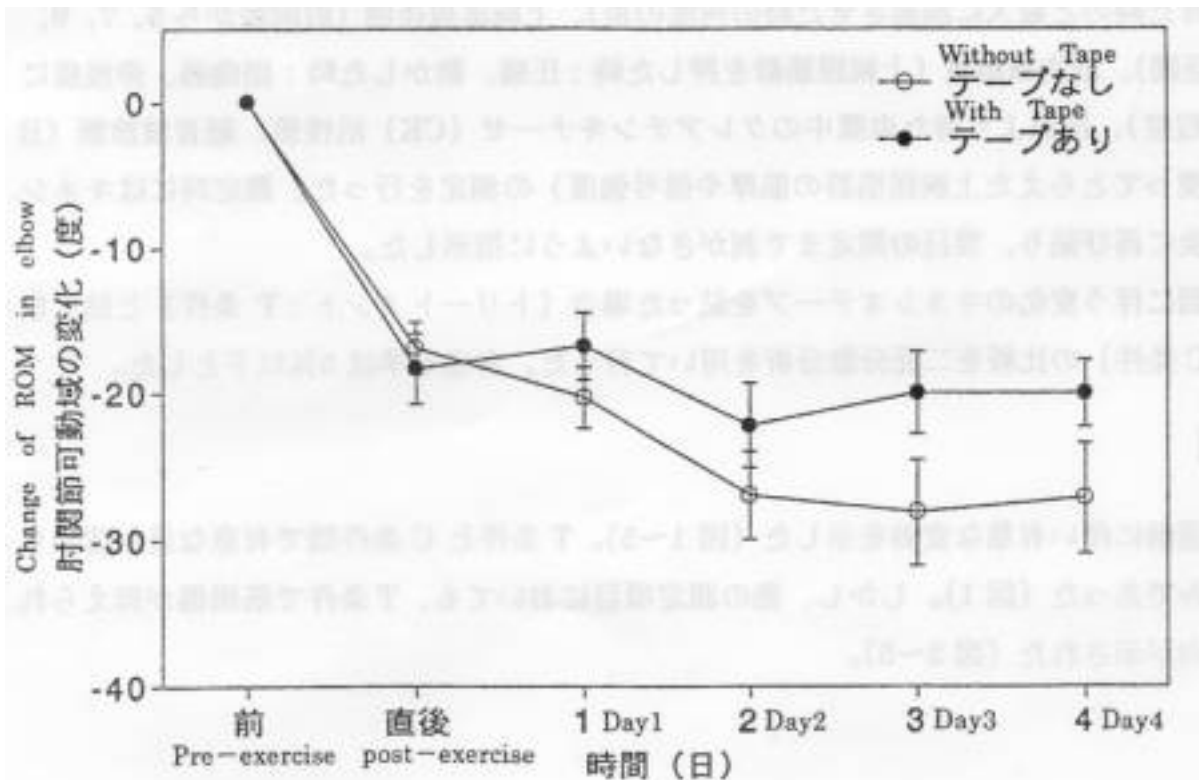


図2：肘関節可動域の変化におけるキネシオテープを貼った場合（テープあり）と貼らなかった場合（テープなし）の比較

Fig2:The change of ROM in Elbow
with Tape and without Tape

Graph 2

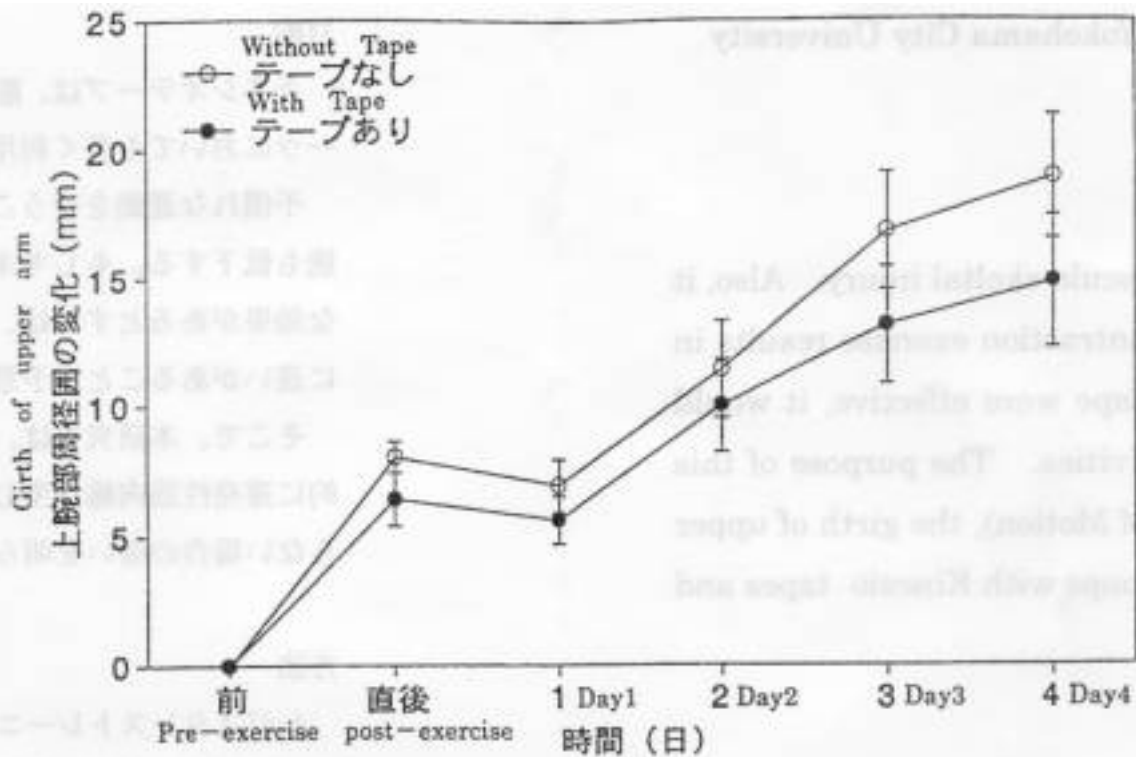


図3：上腕部周径の変化におけるキネシオテープを貼った場合（テープあり）と貼らなかった場合（テープなし）の比較

Fig3.The change of girth of upper arm with Tape and without Tape

Graph 3

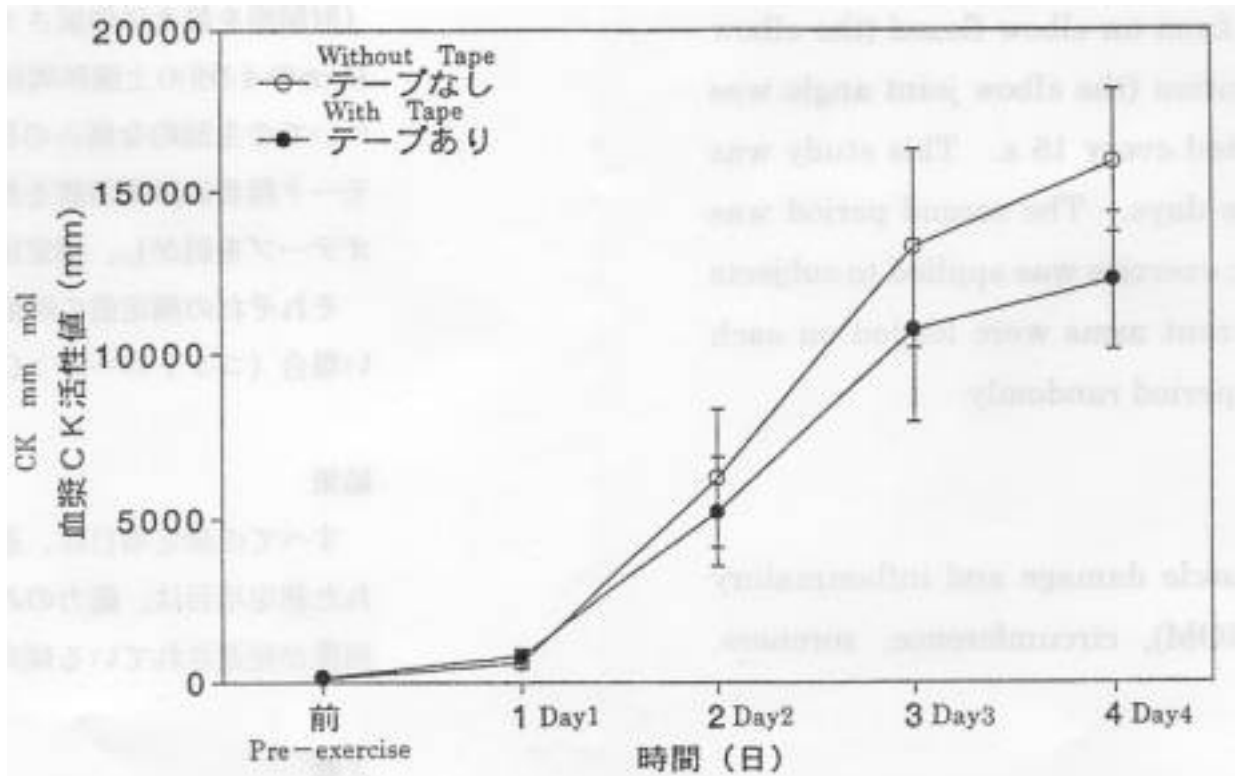
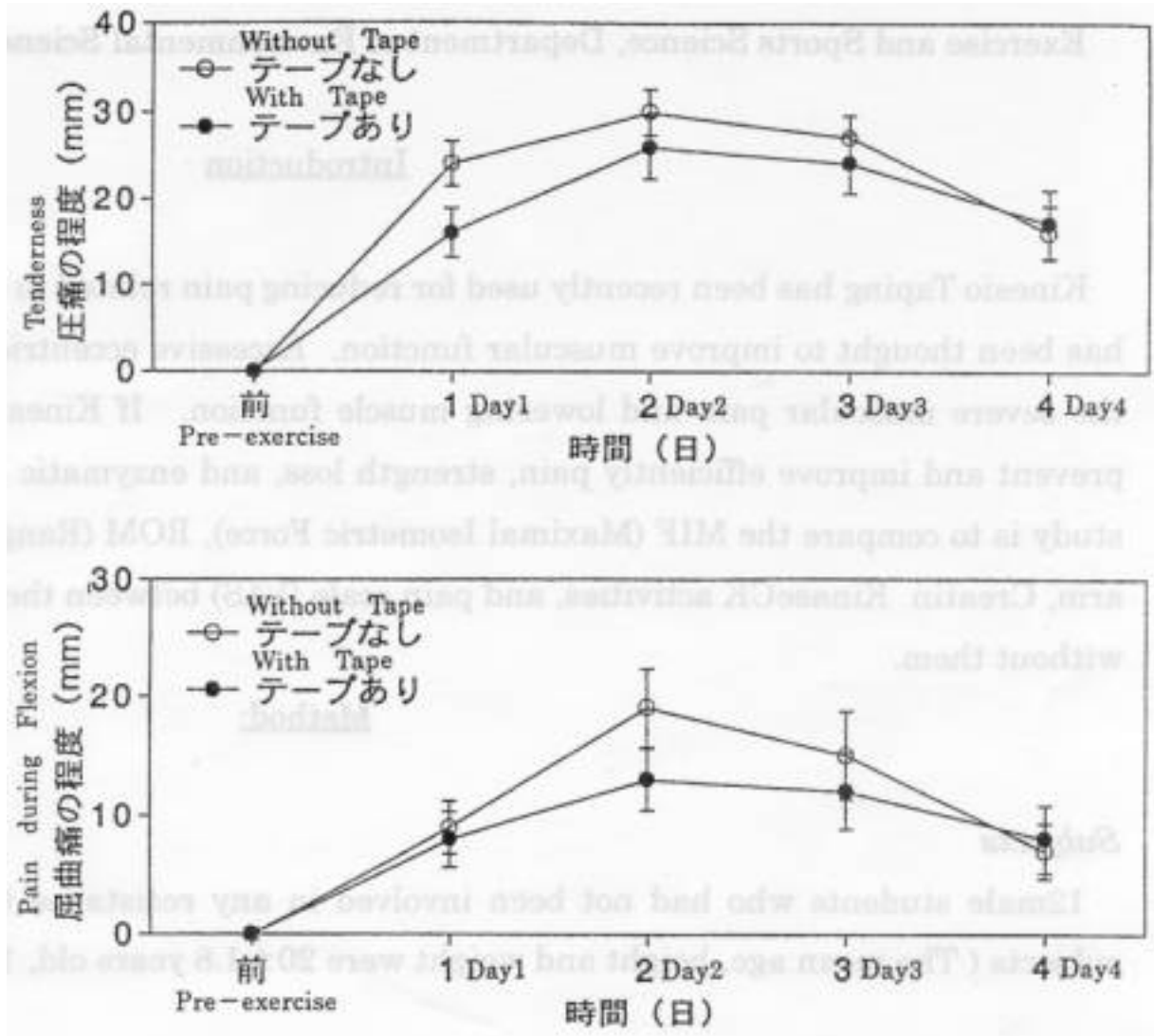


図4：血漿CK活性値の変化におけるキネシオテープを貼った場合（テープあり）と貼らなかった場合（テープなし）の比較

Fig4:The change of Creatine Kinase(CK)
with Tape and without Tape

Graph 4



Graph 5

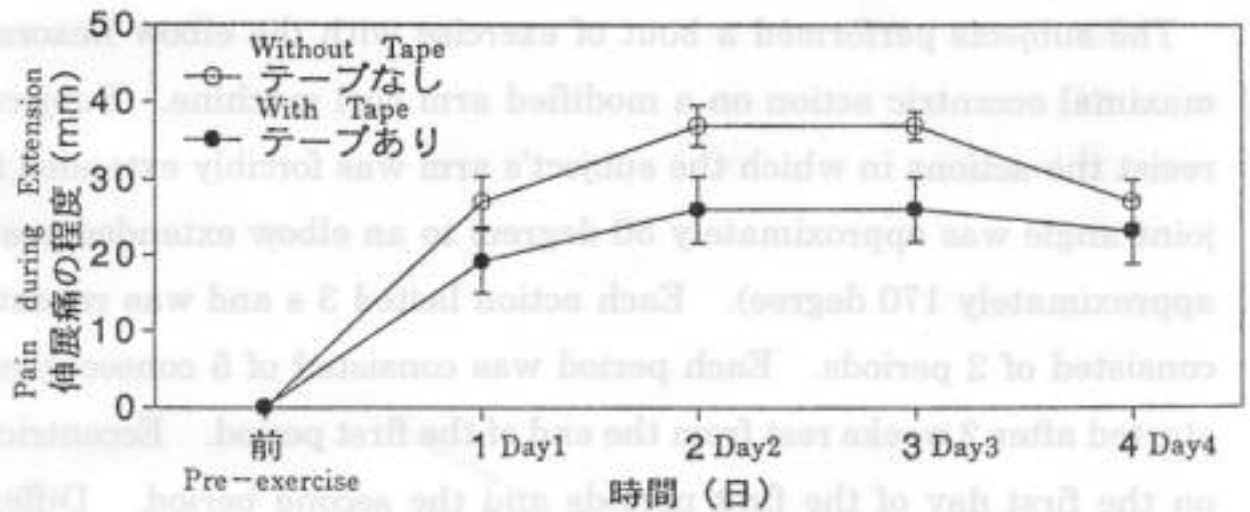


図5：筋肉痛の変化におけるキネシオテープを貼った場合（テープあり）と貼らなかった場合（テープなし）の比較

Fig5: The change of Muscle Soreness with Tape and without Tape

Graph 5, cont.

Results

All the measurements had an acceptable variance between the exercises (graph 1 to 5). However, the only measurement that met the acceptable standard was the muscle strength test (graph 1). However, all the measurements demonstrated a tendency that T (Treatment with tape) controlled the muscle damage and assisted in the recovery.

Discussion

Based on this study, why there was an improvement only to MIF is still unclear. Also for the measurements that did not achieve an acceptable standard, one of the largest cause of error may be based on the individuality of the subjects. Therefore, we will still need to do further research based on this topic using a larger amount of subjects in order to conclude further effects.