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ABSTRACT

INTRODUCTION: Kinesio tape (KT) is a special elastic therapeutic tape used to facilitate the body's natural healing process while allowing support and stability to muscles and joints without restricting the body's range of motion. When applied properly, Kinesio tape is claimed to be able to reduce fatigue and pain, swelling and muscle spasms, as well as to prevent sport injury. Findings from previous studies on Kinesio tape have provided inconsistent results on the effectiveness of Kinesio tape in facilitating muscle performance. **PURPOSE:** The purpose of this study was to investigate the influence of Kinesio taping on biceps brachii muscle performance during an isokinetic exercise (biceps curls). **METHODS:** Twenty healthy voluntary student subjects (9 males and 11 females; mean age 25 ± 6.2 years, height 66.2 ± 3.1 inches, weight 150.8 ± 37.1 lbs) gave their written informed consent and participated in the study. All subjects were instructed to meet in the Biomechanics lab for two testing sessions, each lasting about 15 to 30 minutes, with one day of rest in between sessions. On the first day of testing, a coin was flipped to randomly determine whether the subject would have placebo tape (PT) or Kinesio tape (KT) applied to the biceps brachii of his or her dominant arm and they were not told which tape was applied. On the second day, the other tape was applied instead. An isokinetic dynamometer measured maximal concentric elbow flexion at an angular velocity of 90 d/s as the subjects performed biceps curls. Each testing session consisted of two protocols: a 3-repetition strength protocol followed by a 30-repetition fatigue protocol. **RESULTS:** For the 3-repetition strength protocol, *t*-test results revealed no significant differences for both males and females in elbow peak torque generation and total work done between PT and KT ($p > 0.05$). For the 30-repetition fatigue protocol, *t*-test results revealed a significant difference in work done during the last third of the protocol between PT and KT for males ($p = 0.04$), but not females. Work done during the first third, work fatigue, and average power for both males and females showed no significant differences between PT and KT ($p > 0.05$). **CONCLUSION:** Findings from this investigation indicate that when applied over the biceps brachii, Kinesio tape does not significantly improve biceps brachii performance during an isokinetic exercise, if compared with a placebo tape. However, work done during the last third of the fatigue protocol showed a significant difference between PT and KT in males. This difference may support the claim that Kinesio tape reduces fatigue.

PURPOSE

The purpose of this study was to investigate the influence of Kinesio taping on biceps brachii muscle performance during an isokinetic exercise (biceps curls).

INTRODUCTION

- Kinesio tape is an elastic tape that was developed and created by Dr. Kenzo Kase of Japan in 1996 to serve as a modality to treat musculoskeletal conditions, both for rehabilitation and sports medicine purposes (Fratocchi et al., 2012).
- Kinesio taping has been a widely used modality for a variety of different purposes including rehabilitation, sport injury prevention, and sports performance enhancement (Wong et al., 2012).
- Specific wrapping techniques are utilized to properly apply Kinesio tape depending on which muscle is being targeted. Kinesio tape has been described to have applications for both "muscle facilitation" and "muscle inhibition" technique (Wong et al., 2012).
- Suggested benefits of properly applied Kinesio tape include:
 - Decreased pain and edema
 - Increased joint stability
 - Improved muscle performance
 - Reduced fatigue
 - Prevent sport injury
- Research assessing the effectiveness of Kinesio tape on muscular performance is scarce and studies have provided conflicting results as to whether Kinesio tape is beneficial.

METHODS

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Participants

- Twenty subjects participated (9 males, 11 females)

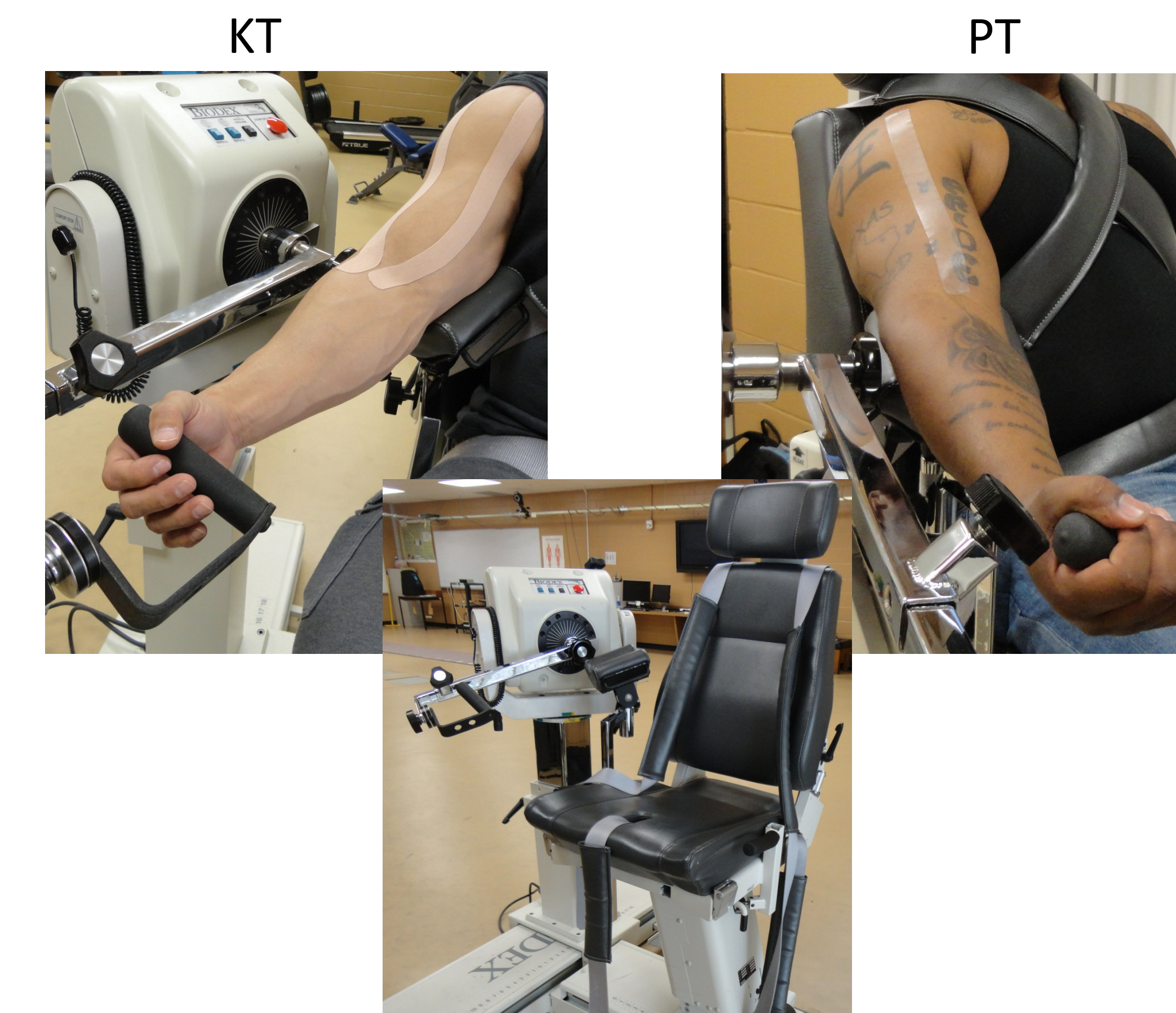
Measurements

- Peak torque (ft-lbs)
- Work (ft-lbs)
- Work fatigue (%)
- Average power (watts)

METHODS

Technique/Analysis

- A 2-inch-wide strip of KT was cut to the length of each subject's biceps brachii muscle. The strip was cut in half, then applied in an "X" shape along the medial and lateral border of the biceps brachii.



Procedures

- Each subject completed 2 testing sessions on 2 separate occasions in which they performed the same tasks but with different taping on their biceps brachii (either KT or PT).
- Subjects were seated and strapped in at the Biodex and adjustments were made to comfortably suit each subject for biceps curls. The Biodex was set to measure maximal concentric elbow flexion at an angular velocity of 90 d/s.
- PT or KT was chosen at random by a coin flip and was applied to the subject's biceps brachii. Subjects were not told which tape was applied. The tape not applied in the first testing session was applied in the 2nd session.
- Strength was evaluated by a 3-repetition strength protocol in which subjects performed 3 biceps curls as hard and fast as possible.
- Endurance was evaluated by a 30-repetition fatigue protocol in which subjects performed 30 biceps curls as hard and fast as possible throughout.

Statistical analysis

- Paired samples *t*-tests were used to compare different biceps brachii performance output between PT and KT.

RESULTS

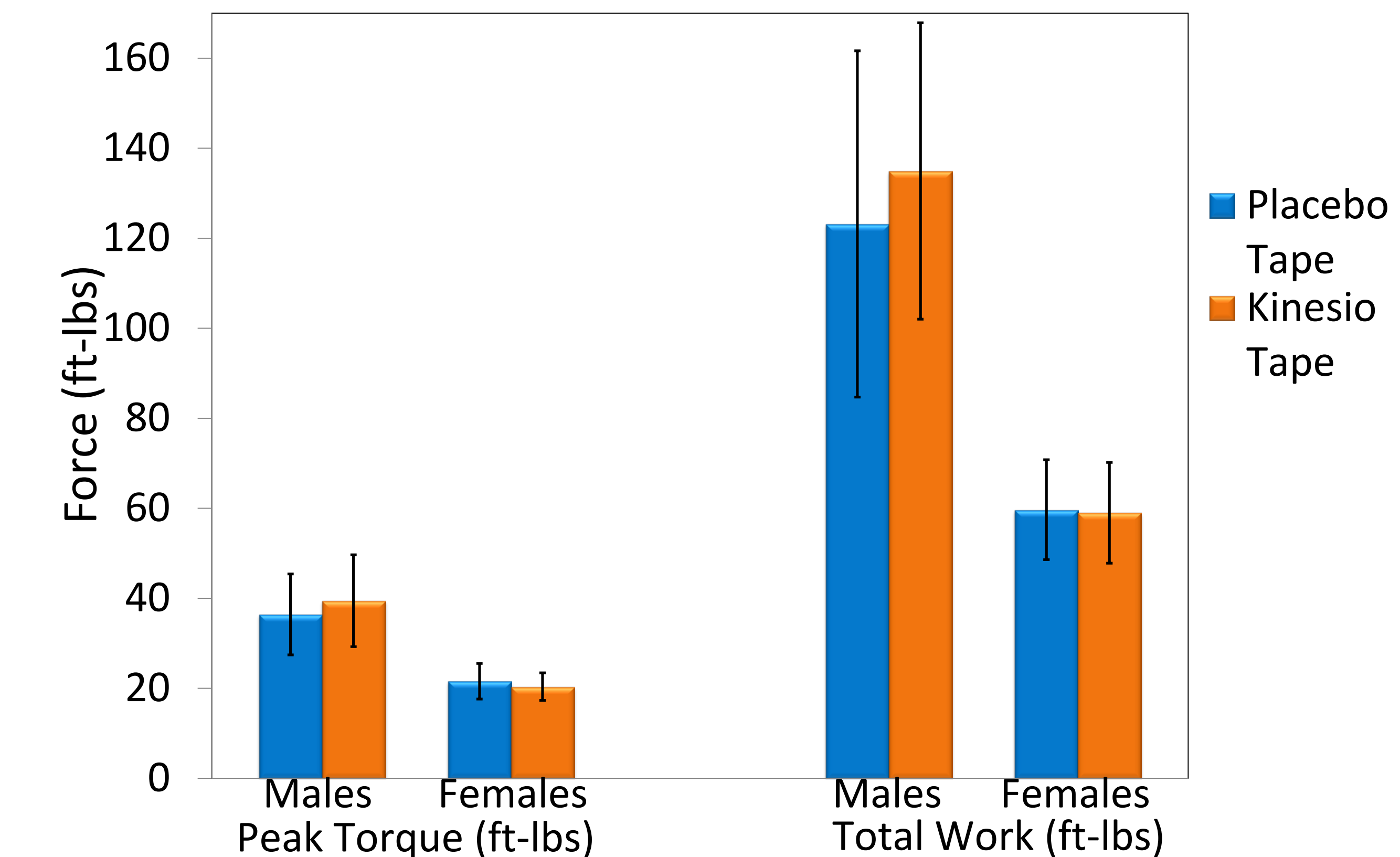


Figure 1. Elbow peak torque generation and total work done with placebo taping and Kinesio taping in male and female subjects during a 3-repetition biceps curls test.

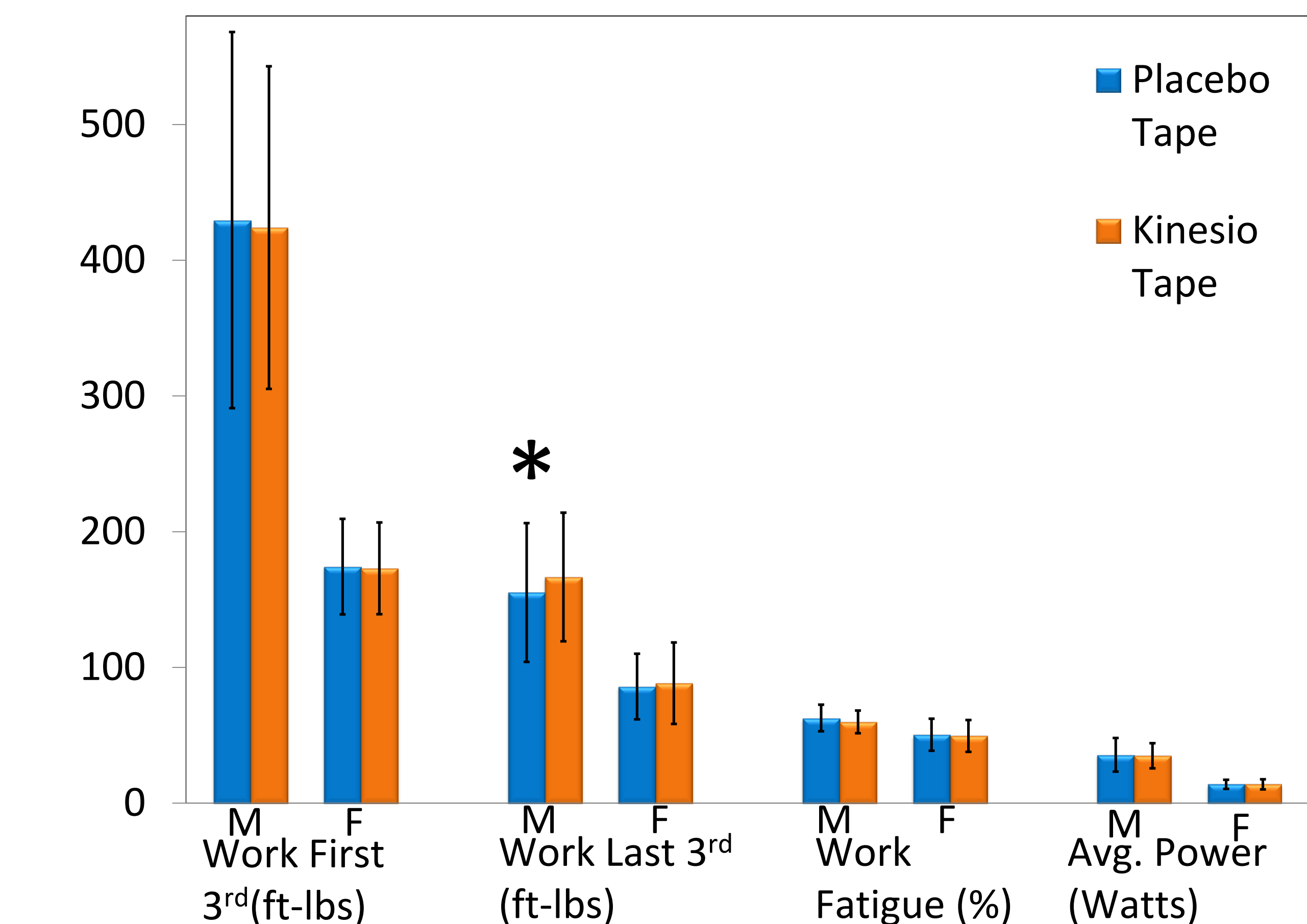


Figure 2. Work done during the first 3rd, last 3rd, work fatigue, and avg. power with placebo taping and Kinesio taping in male and female subjects during maximal 30-rep muscle fatigue tests. * - Difference in work done in last 3rd for males was significant ($p = 0.04$).

CONCLUSIONS

- In this pilot investigation, KT made a significant difference from PT in work done during the last 3rd of the fatigue protocol in males.
- This finding may support claims of KT reducing fatigue.
- In the strength protocol and all other variables analyzed, KT and PT were not significantly different.