

THE EFFECTS OF A SINGLE PERCUSSIVE THERAPY APPLICATION ON ACTIVE LOWER BODY RANGE OF MOTION



STEPHANIE GUZMAN, DAMAR A. BLANCHET, LENA COOK, SUSAN HERRERA, MEGHAN MCCAULEY, WILLIAM PRITCHARD
MENTOR: DR. EDDIE JO

KELLOGG HONORS COLLEGE CAPSTONE PROJECT
CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA, DEPT. OF KINESIOLOGY & HEALTH PROMOTION
HUMAN PERFORMANCE RESEARCH LAB

ABSTRACT

Myofascial release techniques have been widely utilized for a variety of purposes, such as mitigating myofascial pain and muscle tightness, as well as improving range of motion (ROM). Percussive Therapy is a recently popularized technique that involves percussive massage through a mechanical device, such as the Theragun. In practice, users often apply percussive therapy to acutely improve ROM. However, these potential benefits are largely supported by anecdotes, and to our knowledge, no empirical evidence currently exists. **PURPOSE:** Thus, the purpose of this study was to examine the immediate effects of a single percussive therapy treatment via Theragun on active (unassisted) lower body ROM. **METHODS:** In this crossover study, 24 male and female participants underwent a single 5-minute percussive therapy treatment (PT), on the hamstrings of their dominant limb. An active ROM test and a 2D capture system, in the sagittal plane, were used to measure hip flexion ROM before and after treatment. On the contralateral limb, ROM was assessed before and after 5 minutes of rest and served as the control condition (CON). Procedures were then repeated on the quadriceps and knee flexion ROM was assessed, also using an active ROM assessment and 2D motion capture in the sagittal plane. The order in which PT and CON conditions were administered was counterbalanced. Data were analyzed using a two-way ANOVA with significance set at $p < 0.05$. **RESULTS:** PT resulted in a significant improvement in hip flexion ROM ($4.5 \pm 6.8^\circ$, $p = 0.003$) while CON elicited no change. Knee flexion ROM increased significantly following PT ($2.0 \pm 0.9^\circ$, $p = 0.04$), and no change was detected with CON. **CONCLUSIONS:** A single 5-minute percussive therapy treatment via Theragun demonstrated efficacy in acutely increasing ROM of the hip and knee joints when compared to passive rest. These effects are likely mediated through neural manipulations and acute changes in muscle tone.

METHODS

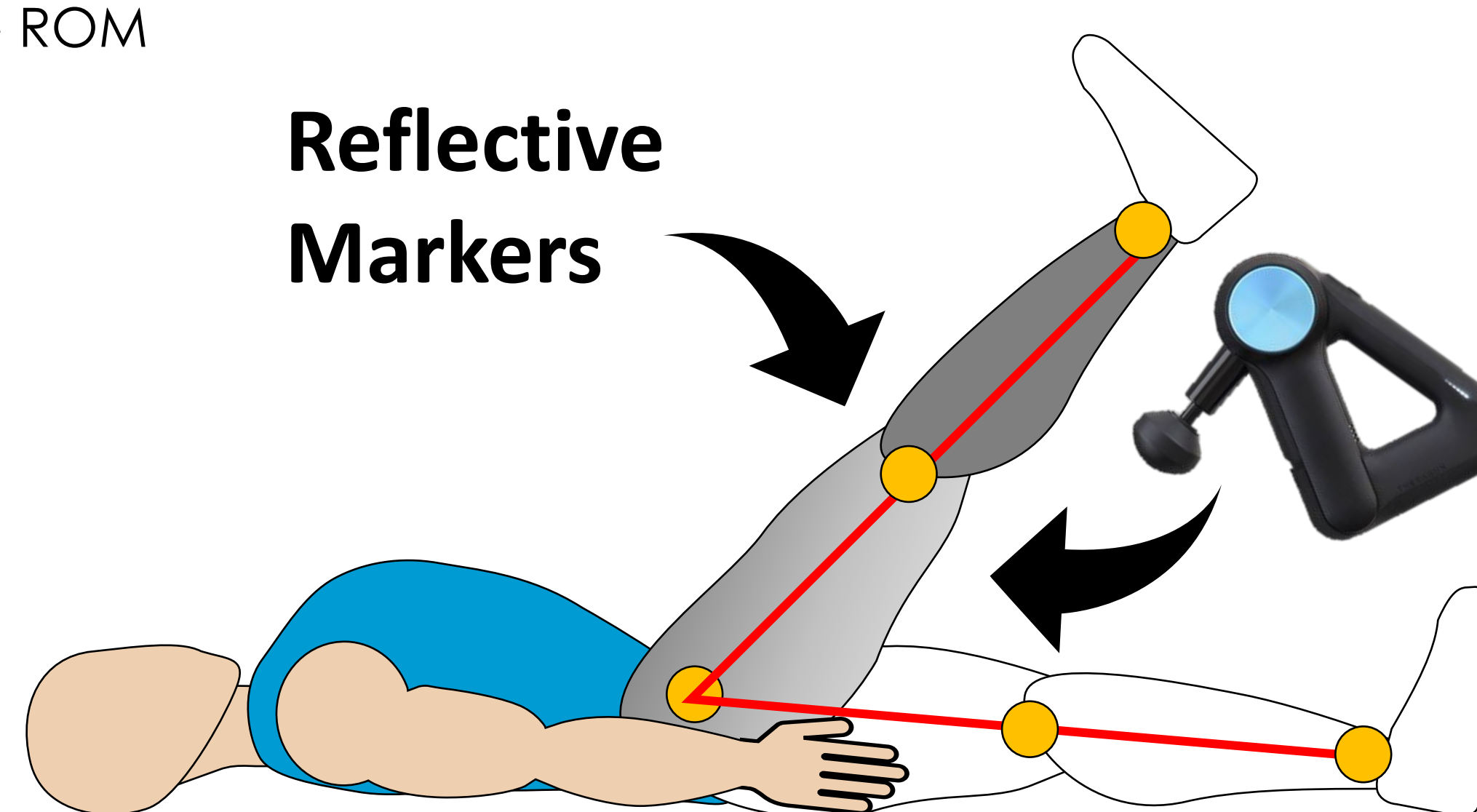
PARTICIPANTS AND DESIGN

In this crossover study, 24 male and female participants underwent a single 5-minute percussive therapy treatment (PT), on the hamstrings of their dominant limb. An active ROM test and a 2D capture system, in the sagittal plane, were used to measure hip flexion ROM before and after treatment. On the contralateral limb, ROM was assessed before and after 5 minutes of rest and served as the control condition (CON). Procedures were then repeated on the quadriceps and knee flexion ROM was assessed, also using an active ROM assessment and 2D motion capture in the sagittal plane.

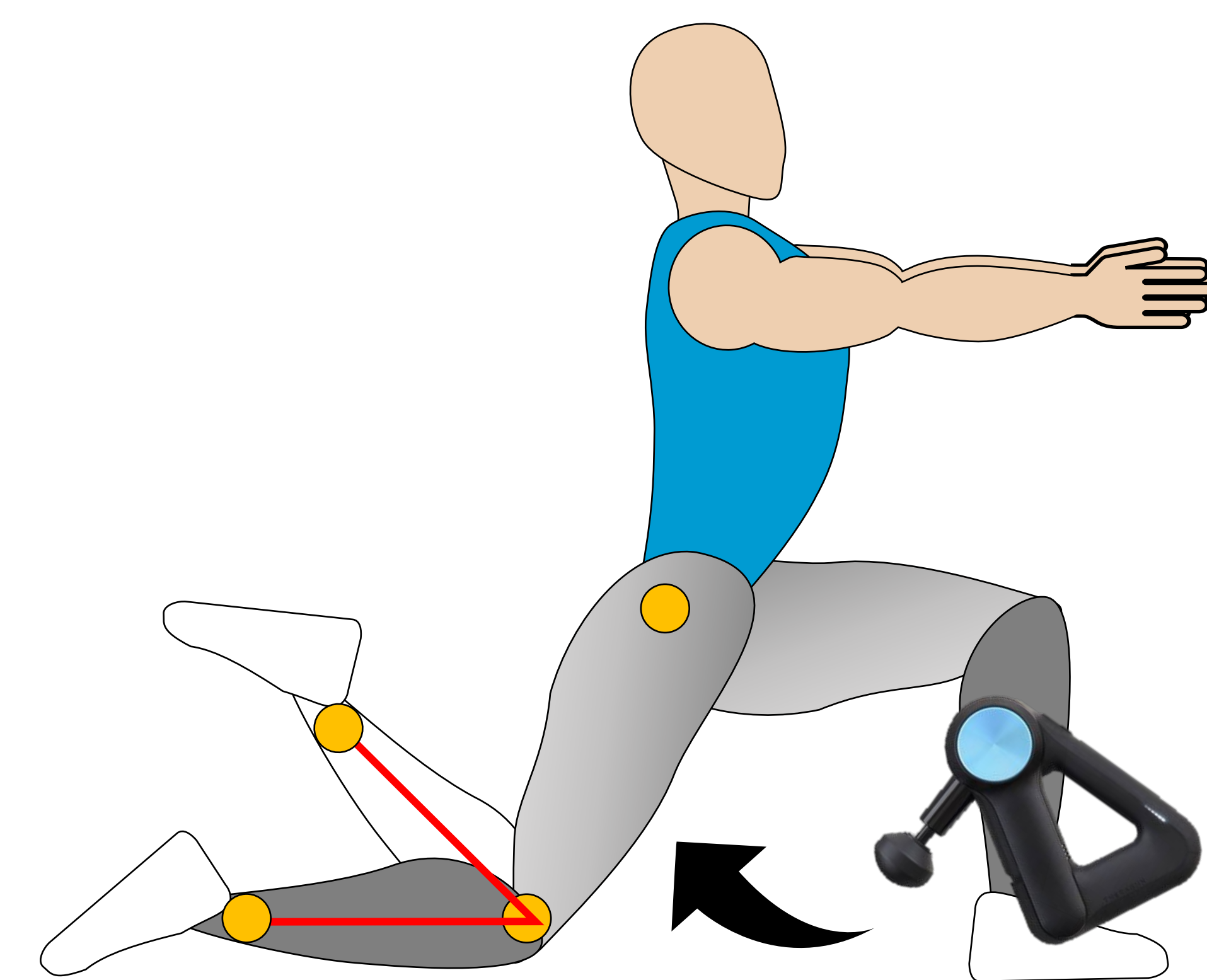
PROCEDURES

The PT condition involved a 5-minute session utilizing a device called the Theragun, which provided 40 percussions/per second. A foam dampener was attached, and treatment was administered on the dominant limb hamstrings and the quads in a sweeping motion from the insertion or origin of the muscle. Passive rest of the contralateral limb was used as a control condition. ROM tests are illustrated here. A 2D motion capture system and reflective markers were placed on the greater trochanter, lateral epicondyle, and lateral malleolus of each subject, to assess ROM using automatic digitation. A two-way (condition x time) ANOVA was used to analyze data with significance set at $p < 0.05$.

HIP FLEXION ROM TEST

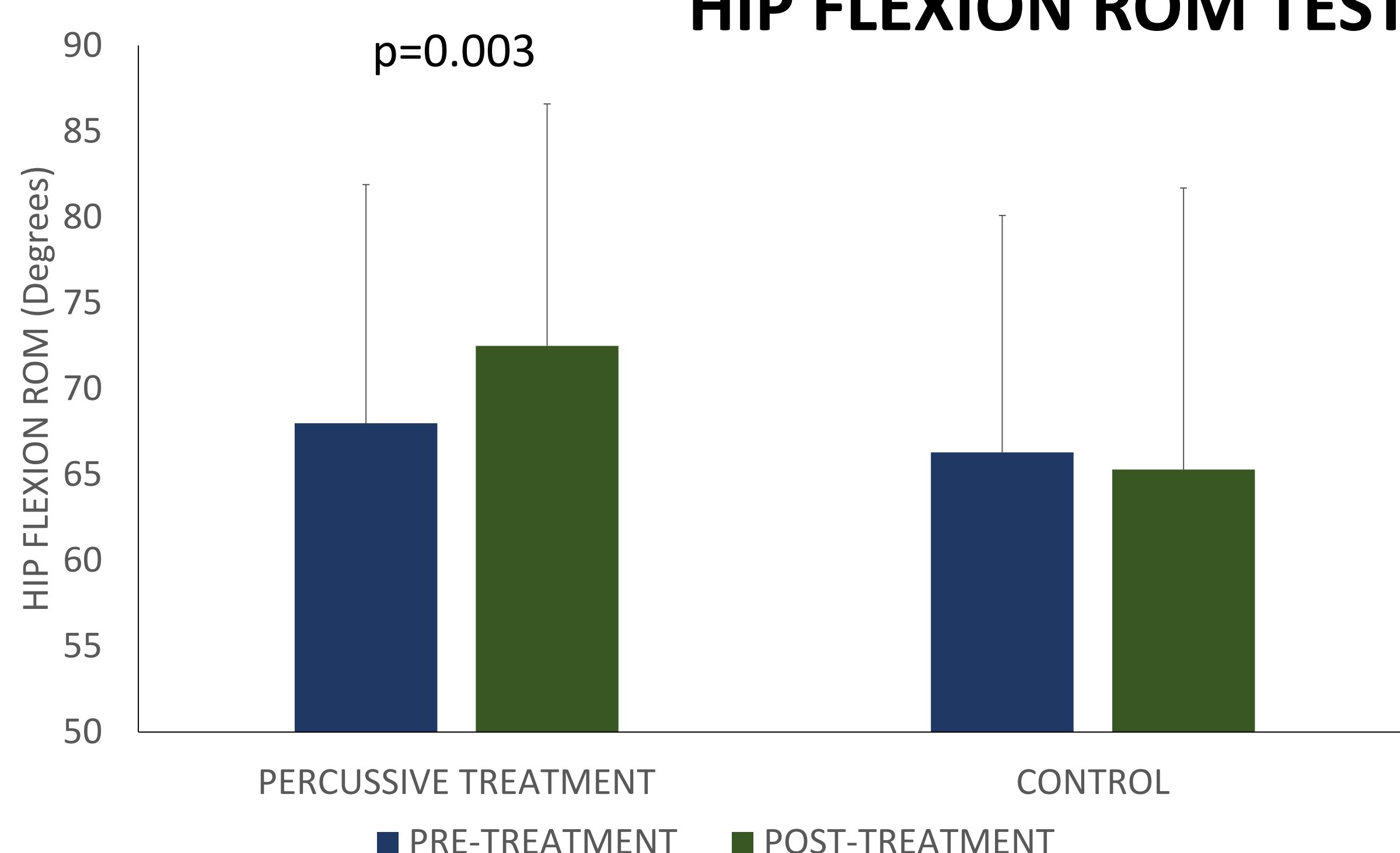


KNEE FLEXION ROM TEST

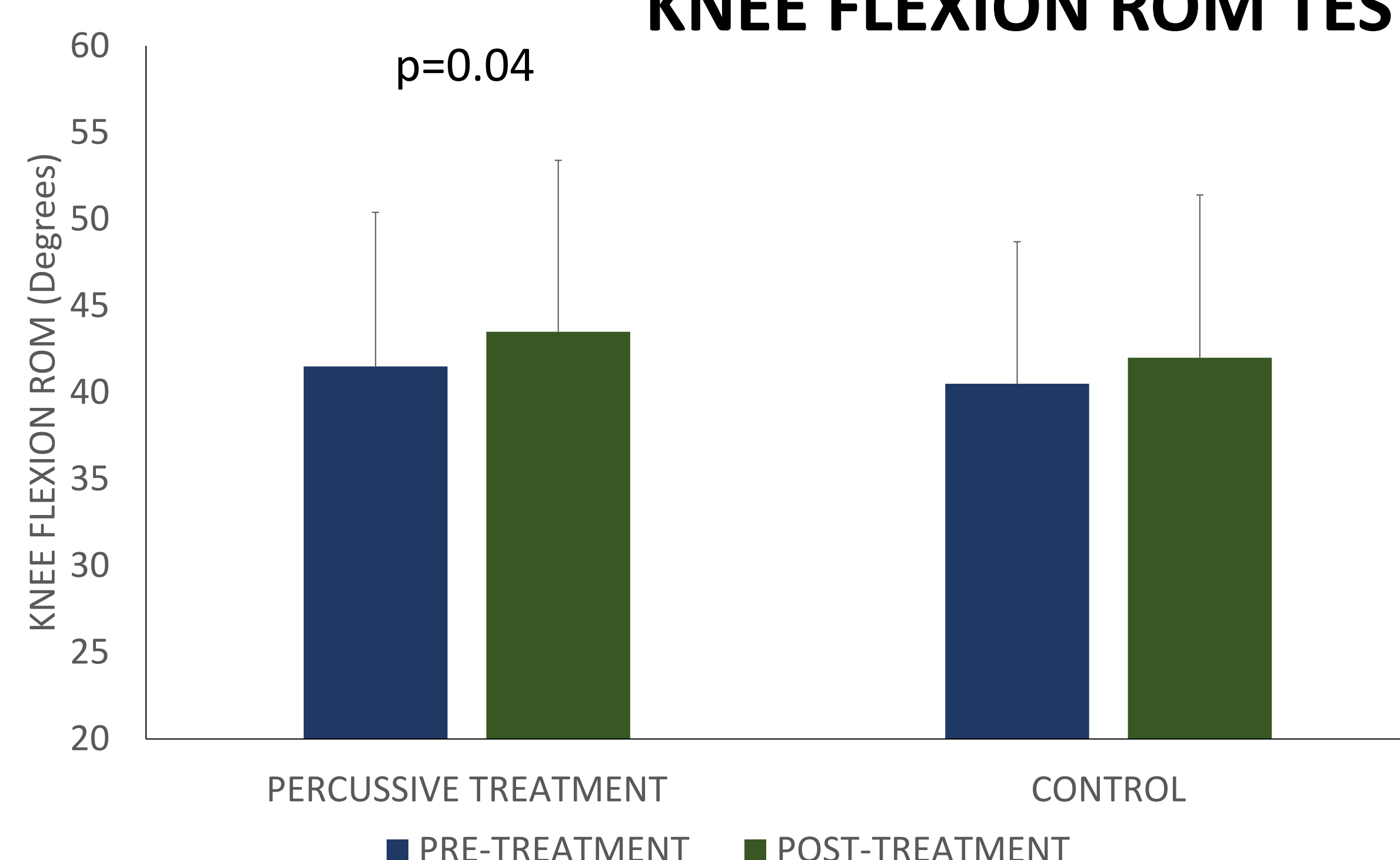


RESULTS

HIP FLEXION ROM TEST



KNEE FLEXION ROM TEST



A single 5-minute percussive therapy treatment resulted in a significant improvement in hip flexion ROM ($4.5 \pm 6.8^\circ$, $p = 0.003$) while the control condition elicited no change.

Knee flexion ROM increased significantly following PT ($2.0 \pm 0.9^\circ$, $p = 0.04$), and no change was detected with CON.

CONCLUSION

A single 5-minute percussive therapy treatment via Theragun, demonstrated efficacy in acutely increasing ROM of the hip and knee joints when compared to passive rest. These effects are likely mediated through neural manipulations and acute changes in muscle tone.

REFERENCES

- Mauntel, T. C., Clark, M. A., & Padua, D. A. (2014). Effectiveness of myofascial release therapies on physical performance measurements: A systematic review. *Athletic Training & Sports Health Care*, 6(4), 189-196.
- Halperin, I., Aboodarda, S. J., Button, D. C., Andersen, L. L., & Behm, D. G. (2014). Roller massager improves range of motion of plantar flexor muscles without subsequent decreases in force parameters. *Int J Sports Phys Ther*, 9(1), 92-102.