Sports Medicine and Rehabilitation Journal

Research Article
Published: 05 Feb, 2019

Clinician *vs*. Self-Administered Suboccipital Release on Hamstring Mobility

Colin Wilhite, Kristin A Paloncy*, Karen Rakowski and Todd Daniel

Department of Kinesiology, Linnaeus University, USA

Abstract

Introduction: Research is sparse as to if any self-administered soft tissue techniques using other devices produce the same gains in mobility as when the clinician delivers the manual trigger point release. The purpose of the study is to see if there is a difference in hamstring mobility, as measured by toe touch distance, between a clinician administered and a patient administered suboccipital release.

Methods: The study employed a descriptive laboratory study with randomization in which 60 participants reported for a single data collection session, and were either put into a clinician or self-administered treatment group. Standing forward flexion distance was measured using a slide ruler box and served as the baseline (pre-test) measurement of the participants hamstring mobility. Participants in the clinician administered group were asked to lie supine on a treatment table while the researcher performed an occipital release technique on the participant for two minutes. The participants in the self-administered group were asked to lie supine on a treatment table and the researcher performed an occipital release technique for five seconds. Using a one inch plastic dowel rod placed on the suboccipital region of the head, the self-administered group was asked to reproduce the same sensation they had felt by the clinician for two minutes. Standing forward flexion was again measured on all participants and recorded as post-test hamstring mobility score.

Findings: There was a statistically significant main effect for the intervention, $F(1,58)=18.24$, $p<0.001$, eta=0.239, indicating that both the clinician administered and the self-administered groups improved from pretest (Pre M=4.74, SD=7.96) to posttest (M=6.79, SD=7.58). But there was not a statistically significant interaction of time and group, $F(1,58)=18.24$, $p=0.360$, eta=0.014, indicating that neither group outperformed the other.

Discussion: The significant clinical implication within the study was that there was no significant difference between gains in hamstring mobility between clinician administered and self-administered suboccipital release. This study demonstrates the effectiveness of a properly taught self-administered suboccipital trigger point release as equal in comparison to clinician administered treatment.

Conclusion: The significant finding in this study is toe touch distance increased for all participants following a suboccipital release. These findings indicate that if a clinician properly instructs a patient on how to perform a suboccipital release, the intervention is just as successful as when the clinician performs the suboccipital release. Future research should explore the effects of suboccipital release on to touch over time, as the current study only measured the immediate effects.

OPEN ACCESS

****Correspondence:***
Kristin A Paloncy, Department of Kinesiology, Linnaeus University, 30 North Brainard, Stadium Room 308, Naperville IL 60540, USA; Tel: 6306375515;
E-mail: kapaloncy@noctrl.edu

Received Date: *07 Jan 2019*
Accepted Date*: 29 Jan 2019*
Published Date*: 05 Feb 2019*

Citation:
Wilhite C, Paloncy KA, Rakowski K, Daniel T. Clinician vs. Self-Administered Suboccipital Release on Hamstring Mobility. Sports Med Rehabil J. 2019; 4(1): 1043.

Introduction

Trigger points are hyperirritable localized areas in a tight band of skeletal muscle, which usually have referred pain [1]. While it is still uncertain how the nervous system forms trigger points, there is evidence that they can negatively affect the mobility of other parts of the body through fascial tissue [1-3]. Fascia is made up of sheets of contractile tissue that form around muscles and joints which connect different sections of the body to one another, allowing the body to function as one unit [4-8]. Therefore, if a trigger point or other restriction is impacting the motion of a muscle or joint, the restriction will also affect other parts of the body due to the connecting fascial tissue [2,3,9].

The superficial back line is a facial tissue structure that runs on the posterior aspect of the body and connects the hamstrings to the occipital muscles [6]. A trigger point that is causing pain or negatively impacting the mobility of one area connected to the superficial back line such as the suboccipital muscles will have and an effect on different areas within this facial tissue line such as the hamstrings [6].

Both latent and active trigger point therapy are techniques used commonly by clinicians to reduce pain and increase tissue extensibility in areas with identified trigger points [10-15]. One common trigger point soft tissue technique used to restore head and neck motion is the suboccipital release [9]. This technique can be performed by having the patient lay supine on a treatment table while light pressure is applied to any trigger point in the occipital muscles. In most cases, the pressure is applied manually by the clinician using their fingertips [10-13]. However, there are other types of devices such as lacrosse balls, dowel rods or other devices that can be used for trigger point release instead of the clinician's fingertips [10-13]. Following a clinician administered trigger point release, studies have shown an immediate increase in hamstring mobility upon alleviation of occipital trigger points because these structures are connected through the superficial back line [2,9].

Research is sparse as to if any self-administered soft tissue techniques using other devices produce the same gains in mobility as when the clinician delivers the manual trigger point release. The purpose of the study is to see if there is a difference in hamstring mobility, as measured by toe touch distance, between a clinician administered and a patient administered suboccipital release.

Methodology and Participants

The study employed a descriptive laboratory study with randomization in which participants reported for a single data collection session. Following institutional IRB approval, participants were recruited from a division 1 university in the Midwest through verbal announcements. Participants included a convenience sample (n=60) of 18-24 year olds and were randomly assigned to either a control group (n=30) or an experimental group (n=30). The sample comprised 31 males (51.7%) and 29 females (48.3%). Following written consent, inclusion criteria of no current pain or injuries to the neck or back were reviewed with each participant. All 60 participants (100%) were included in the study.

Procedure design

On the day of the study, all participants (n=60) reported to a classroom laboratory at the University and signed in on an attendance sheet. Those that signed in on an odd numbered line were assigned to the clinician administered group (control), and those that signed in on an even numbered line on the attendance sheet were assigned to the self-administered group (experimental).

Standing forward flexion distance was measured using a slide ruler box and served as the baseline (pre-test) measurement of the participants hamstring mobility. Each participant (both control and experimental group) completed three baseline measurements using this method and the researcher used the best score as the recorded pre-test score. All measurements and subsequent intervention was conducted by one trained evaluator to control for variability and bias.

Following baseline measurements, the researcher individually worked with each participant. Participants in the clinician administered group were asked to lie supine on a treatment table while the researcher performed an occipital release technique on the participant for two minutes. The participants in the self-administered group were asked to lie supine on a treatment table and the researcher performed an occipital release technique for five seconds. This was done so that the participant could identify the feeling they should replicate during an occipital release. The participant was then given a one inch in diameter plastic dowel rod that they placed in the suboccipital region of their head. They were instructed to reproduce the same sensation as they had felt by the clinician for two minutes.

Immediately following completion of the clinician administered or self- administered occipital release intervention, standing forward flexion was again measured on all participants (n=60). Again, the standing forward flexion distance score was measured three times using the slide ruler box and the best score was recorded as the post-test hamstring mobility score. All participants were then thanked for their participation and dismissed.

Data analysis

Before conducting hypothesis testing, the data were examined for potential violations of the assumptions of repeated-measures ANOVA. Data were assessed for outliers using boxplots; no outliers were found. A Shapiro-Wilk test showed that both the pretest (p=0.46) and the posttest data (p=0.10) were normally distributed. While conducting the mixed repeated measures ANOVA (pretest to posttest, control *vs.* experimental), Box's Test of Equality of Covariance Matrices was non-significant (M=5.72, p=0.138), indicating that the covariance matrices were equivalent, so all ANOVA interpretations were done using multivariate tests.

Results

There was a statistically significant main effect for the intervention, F(1,58)=18.24, p<0.001, eta=0.239, indicating that both the clinician administered and the self administered groups improved from pretest (Pre M=4.74, SD=7.96) to posttest (M=6.79, SD=7.58). But there was not a statistically significant interaction of time and group, F(1,58)=18.24, p=0.360, eta=0.014, indicating that neither group outperformed the other. These findings show that the intervention was successful at increasing hamstring mobility an average of 2 points regardless of whether the intervention was conducted by a clinician or the patient. The magnitude of the hamstring mobility increase is displayed in (Figure 1).

Discussion

The current study suggests that hamstring mobility, as measured by toe touch distance, significantly increases following suboccipital release. Previous literature supports this finding [2,9]. In a randomized clinical trial, Aparicio et al. [2] found the suboccipital release

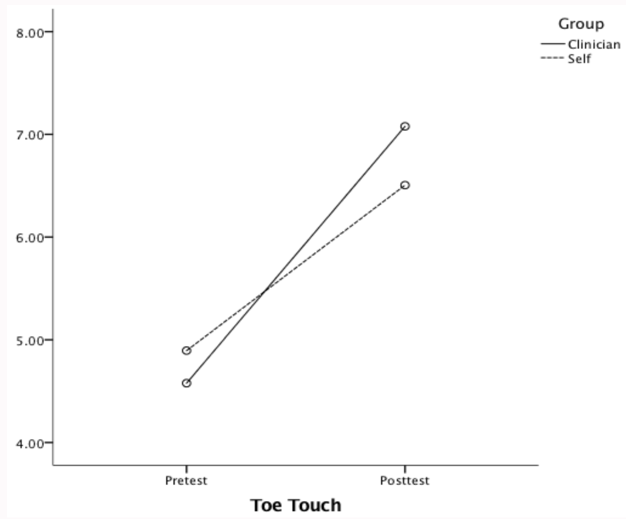

Figure 1: Increases in hamstring mobility by group.

technique significantly improved hamstring elasticity as measured by toe touch distance, straight leg raise, and popliteal angle. Further, studies show when a release is performed on an area of restriction that is within a fascial tissue structure such as the superficial back line, it will have a positive effect on other areas that connect to this line [2,9]. The current study supported these findings because when trigger points in the suboccipital area were alleviated, an immediate increase in hamstring mobility was observed.

The researchers in the current study utilized toe touch distance as the single measurement hamstring mobility. Kippers and Parker [16] found toe touch to be a valid and reliable test to measure active trunk and hamstring range of motion across all body types. Further, another study concluded that toe touch distance could be used as the sole measurement of hamstring mobility to accurately assess for gains of end range of motion following clinician administered suboccipital release [9]. It can be concluded from these studies, as well as the current research, that following a suboccipital release a patient will experience short term gains in hamstring mobility.

The significant clinical implication within the study was that there was no significant difference between gains in hamstring mobility between clinician administered and self-administered suboccipital release. This study demonstrates the effectiveness of a properly taught self-administered suboccipital trigger point release as equal in comparison to clinician administered treatment.

In a similar study examining the effectiveness of reducing trigger point sensitivity in the neck and upper back, the researchers measured pain intensity following prescribed home programs of ischemic pressure and stretching [17]. The authors concluded that when monitored periodically by a clinician, home programs using self-administered therapy techniques are an effective method for reducing trigger point pain.

In our current age of managed care, clinicians in a therapy setting are limited in treatment times and number of clinic visits with their patients. Therefore, it is of great benefit when a clinician can identify manual therapy techniques such as the suboccipital release that can be taught to their patients and successfully administered outside of the clinical setting. This allows the clinician time within the scheduled therapy session to focus their intervention on other clinical goals.

Conclusion

The significant finding in this study is toe touch distance increased for all participants following a suboccipital release. These findings indicate that if a clinician properly instructs a patient on how to perform a suboccipital release, the intervention is just as successful as when the clinician performs the suboccipital release. Future research should explore the effects of suboccipital release on toe touch over time, as the current study only measured the immediate effects.

References

1. Fernández-de-las-Peñas C, Dommerholt J. Myofascial trigger points: Peripheral or central phenomenon? Curr Rheumatol Rep. 2014;16(1):394-400.
2. Aparicio EQ, Quirante LB, Blanco CR, Sendín FA. Immediate effects of the suboccipital muscle inhibition technique in subjects with short hamstring syndrome. J Manipulative Physiol Ther. 2009;32(4):262-9.
3. Fernandez-de-las-Penas C, Carratala-Tejada M, Luna-Olivia L, Miangolarra-Page J. The immediate effect of hamstring muscle stretching in subjects' trigger points in the masseter muscle. J Musculoskelet Pain. 2006;14(3):27-35.
4. Benjamin M. The fascia of the limbs and back- A review. J Anat. 2009;214(1):1-18.
5. Kline C. Fascial manipulation. JACA. 2011;48(2):2-5.
6. Myers T. Anatomy trains. 3rd ed. New York: Churchill Livingstone, UK; 2014.
7. Schleip R, Klingler W, Lehmann-Horn F. Fascia is able to contract in a smooth muscle-like manner and thereby influence musculoskeletal mechanics. In: Liepsch D, editor. Biomechanics; Proceedings of the 5th World Congress of Biomechanics. Germany; 2006. p. 51-4.
8. Stecco C, Macchi V, Porzionato A, Duparc F. Fascia: The forgotten structure. Anat Embry. 2011;116(3):127-38.
9. Trokey T. Effect of suboccipital release soft tissue technique on toe touch measurement. Bear Works. 2014.
10. Barnes M. The basic science of myofascial release: Morphologic change in connective tissue. J Bodywork and Move Ther. 1997;1(4):231-6.
11. Celik D, Mutlu E. Clinical implication of latent myofascial trigger point. Current Pain Headache Rep. 2013;17(8):353.
12. Fernandez-de-las-Penas C. Interaction between trigger points and joint hypermobility: A clinical perspective. J Man and ManipTher. 2005;17(2):74-7.
13. Fryer G, Hodgson L. The effect of manual pressure release on myofascial trigger points in the upper trapezius muscle. J Bodyw Mov Ther. 2005;9(4):248-55.
14. Jonsson C. The role of myofascial trigger points in shoulder pain: A literature review. Journal of Australian Traditional-Medicine Society. 2012;18(3):139-43.
15. Lucas K, Polus B, Rich P. Latent myofascial trigger points: Their effects on muscle activation and movement efficiency. J Bodyw Mov Ther. 2004;8(3):160-6.
16. Kippers V, Parker AW. Toe-touch test: A measure of its validity. Phys Ther. 1987;67(11):1680-4.
17. Hanten WP, Olson SL, Butts NL, Nowicki AL. Effectiveness of a home program of ischemic pressure followed by sustained stretch for treatments of myofascial trigger points. Phys Ther. 2000;80(10):997-1003.