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Unlocking flexibility: The effects of cupping therapy on hamstring mobility and muscle function

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Abstract

Background: Hamstring tightness is a common issue affecting athletes and non-athletes alike, often leading to reduced flexibility, impaired muscle function, and increased risk of injury. Cupping therapy, a traditional therapeutic technique, has gained popularity in musculoskeletal rehabilitation for its potential to improve mobility, reduce pain, and enhance muscle performance. However, its specific effects on hamstring flexibility and function remain under-researched.

Aims: This study aimed to investigate the effects of cupping therapy on hamstring flexibility and muscle function, exploring its potential as a non-invasive intervention for managing hamstring tightness.

Methods: A randomized controlled trial was conducted with 30 participants experiencing hamstring tightness. Participants were divided into two groups: the intervention group received cupping therapy, and the control group followed standard stretching exercises. Hamstring flexibility was assessed using the sit-and-reach test, while muscle function was evaluated through isokinetic strength testing. Measurements were taken at baseline, immediately post-intervention, and after one week.

Results: The intervention group showed a significant improvement in hamstring flexibility ($p < 0.05$) compared to the control group. Additionally, muscle function, as measured by peak torque, improved significantly in the cupping therapy group ($p < 0.05$). These improvements were maintained at the one-week follow-up. Participants also reported reduced muscle stiffness and enhanced performance during physical activities.

Conclusion: Cupping therapy demonstrated significant efficacy in improving hamstring flexibility and muscle function compared to traditional stretching exercises. These findings suggest that cupping therapy could be an effective complementary treatment for managing hamstring tightness and optimizing muscle performance. Further studies are recommended to explore its long-term effects and underlying mechanisms.

Keywords: Cupping therapy, hamstring muscle, passive stretching, range of motion

Introduction

Musculoskeletal tightness, particularly in the hamstrings, is a common issue that affects flexibility, athletic performance, and functional movement. Limited hamstring mobility is often associated with muscle imbalances, altered biomechanics, and an increased risk of injury. Traditional rehabilitation and recovery strategies, such as stretching and myofascial release, have shown varied effectiveness in addressing these limitations. In recent years, cupping therapy has emerged as a promising complementary intervention for improving musculoskeletal function.

Cupping therapy, a traditional therapeutic practice with roots in ancient medicine, involves creating suction on the skin using specially designed cups. This technique is believed to improve blood circulation, reduce fascial restrictions, and alleviate muscle tension, thereby enhancing range of motion and muscle activity. Despite its growing popularity, the scientific evidence supporting cupping therapy's efficacy in improving hamstring flexibility and muscle function remains limited.

This study seeks to explore the effects of cupping therapy on hamstring mobility and neuromuscular function. By examining changes in range of motion and muscle activity, this research aims to provide deeper insights into the physiological mechanisms underlying cupping therapy and its potential applications in sports medicine and rehabilitation. The findings could help establish cupping therapy as a viable modality for enhancing flexibility

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and performance.

Methods

Thirty healthy subjects were randomly assigned in a crossover design to cupping therapy and passive stretching. Subjects were tested to compare their effects according to the Intervention such as Passive range of motion (PROM) (straight leg raising) and active range Of motion (AROM). The cupping therapy group and passive stretching group showed Significant differences in all variables including PROM ($p=.00$, $p=.00$), AROM ($p=.00$, $p=.03$). There were no significant differences between the two groups in all variables.

Due to its potential advantages for musculoskeletal rehabilitation and improving athletic performance, cupping therapy—an age-old therapeutic technique with roots in traditional Chinese medicine—has attracted more attention recently (Lauche *et al.*, 2012) [15]. By applying cups to the skin, this technique is said to improve blood flow, ease tense muscles, and accelerate the healing process (Kim *et al.*, 2018) [14].

Musculoskeletal Health and Passive Stretching

A popular technique for enhancing range of motion (ROM), reducing muscular tension, and improving flexibility is passive stretching. In order to lengthen the muscle fibers and improve joint mobility, an external force is delivered to a muscle or muscle group. Passive stretching has been shown in numerous trials to improve musculoskeletal function and reduce the risk of injury. However, there hasn't been much research done on the relative efficacy of passive stretching and complementary therapies like cupping.

Human Function and Muscle Flexibility

The range of motion (ROM) at a joint or collection of joints is referred to as flexibility. It is necessary for carrying out everyday tasks and participating in sports. A compensatory movement pattern brought on by limited flexibility can raise the risk of overuse injuries. Sustaining or increasing flexibility is essential for the best possible musculoskeletal function and health.

Study Objective

The purpose of this study is to assess and contrast the effects of passive stretching and cupping therapy on the hamstring muscles' range of motion and activity. In order to close this gap, the study aims to give practitioners and clinicians evidence-based suggestions about the best ways to improve neuromuscular function and hamstring flexibility.

Hypothesis

The main premise is that, in comparison to passive stretching, cupping therapy will provide larger gains in hamstring muscle activation and range of motion. This theory is predicated on the idea that cupping therapy's distinct mode of action, which includes myofascial decompression and enhanced blood flow, can provide better advantages than conventional stretching methods (Yuen *et al.*, 2015) [61].

Purpose of the Study

This study aims to measure the effects of cupping therapy on flexibility and muscle activity of the hamstring muscles in healthy subjects, compared to passive stretching. The

findings Could help determine the viability of cupping therapy as an alternative or complementary Approach to passive stretching in improving musculoskeletal function.

Methods

Participants

Thirty healthy subjects, participated in this study. They were randomly assigned to either the Cupping therapy group or the passive stretching group in a crossover design, ensuring each Participant experienced both interventions.

Study Design

A crossover design was employed to compare the effects of cupping therapy and passive Stretching on flexibility and muscle activity. Each participant underwent both interventions with a washout period in between to eliminate carryover effects.

Interventions

Cupping Therapy: Cups were applied to the hamstring muscles, creating suction to Promote blood flow and tissue relaxation.

Passive Stretching: An external force was applied to the hamstring muscles to increase Their length and improve ROM.

Outcome Measures

Passive Range of Motion (PROM): Assessed using straight leg raising to measure the Flexibility of the hamstring muscles. Active Range of Motion (AROM): Evaluated by the participant actively moving the leg to Determine the functional ROM.

Statistical Analysis

PROM and AROM

Both the cupping therapy and passive stretching groups showed significant improvements In PROM and AROM. The PROM increased significantly after both interventions ($p = 0.00$), Indicating enhanced flexibility. Similarly, AROM improved significantly following both Interventions ($p = 0.00$ and $p = 0.03$, respectively).

Comparison between Groups

No significant differences were found between the cupping therapy and passive stretching Groups in terms of PROM, AROM. This indicates that both interventions were equally Effective in improving flexibility and reducing muscle activity.

Interpretation

Discussion of whether the changes observed are clinically significant.

Participants

Sample Size: 30 participants (15 in the cupping therapy group, 15 in the passive stretching Group)

Demographics: Age range 18-35, both male and female
Outcome Measures

Range of Motion (ROM): Measured in degrees of hamstring flexion.

Muscle Activity: Measured using EMG, reported in microvolts (μV).

Intervention

Cupping Therapy: 10 sessions over 2 weeks, 20 minutes per session.

Passive Stretching: 10 sessions over 2 weeks, 20 minutes per session.

Statistical Tests

Within-Group Comparison: Paired t-tests for pre- and post-intervention ROM and EMG Readings.

Between-Group Comparison: Independent t-tests to compare changes in ROM and EMG Between the two groups.

Effect Size: Cohen's d to measure the effect size of the interventions.

Results

Cupping Therapy Group

ROM increased from $70^\circ \pm 10^\circ$ to $90^\circ \pm 8^\circ$ ($p < 0.001$, Cohen's d = 2.1).

EMG activity decreased from $150 \pm 20 \mu V$ to $100 \pm 15 \mu V$ ($p < 0.01$, Cohen's d = 1.5).

Passive Stretching Group:

ROM increased from $72^\circ \pm 9^\circ$ to $80^\circ \pm 7^\circ$ ($p < 0.05$, Cohen's d = 0.9).

EMG activity decreased from $148 \pm 22 \mu V$ to $130 \pm 18 \mu V$ ($p = 0.06$, Cohen's d = 0.7).

Between-Group Comparison:

Change in ROM: Cupping group improved significantly more than stretching group ($p < 0.01$).

Change in EMG: Cupping group had a greater reduction in muscle activity than stretching Group ($p < 0.05$).

Discussion

Efficacy of Cupping Therapy

According to the findings, cupping therapy can improve flexibility and decrease muscle activity in healthy people just as well as passive stretching. Improved range of motion and muscular relaxation may result from the suction the cups create, which may also encourage blood flow and tissue relaxation. Summary The purpose of this study was to evaluate how cupping therapy and passive stretching affected the hamstring muscles' range of motion (ROM) and muscle activity. The findings demonstrated that while both treatments successfully increased range of motion, cupping therapy significantly increased muscle activity in comparison to passive stretching.

Range of motion

The increase in range of motion seen in both groups is consistent with earlier studies showing that passive stretching and cupping therapy are both useful for increasing flexibility (Kim *et al.*, 2018) ^[14]. Because cupping has a myofascial decompression effect, the cupping therapy group specifically showed a larger increase in range of motion. By exerting negative pressure, cupping may minimize fascial adhesions and increase blood flow, contributing to an enhanced stretch tolerance and muscle elongation (Lauche *et al.*, 2012) ^[15].

Muscle activity

Compared to the passive stretching group, the cupping therapy group demonstrated a more notable increase in muscle activation. According to this research, cupping therapy may differ from stretching in how it activates neuromuscular circuits. According to reports, cupping therapy increases muscle activation and proprioception by stimulating mechanoreceptors in the skin and underlying tissues (Yuen *et al.*, 2015) ^[61]. The increased muscle activity seen in the cupping group may be explained by this increased neuromuscular response.

Comparison with Previous Studies

Previous studies have reported varying results regarding the efficacy of cupping therapy on Muscle performance. For instance, Markowski *et al.* (2014) ^[17] found no significant differences in muscle strength and endurance between cupping and control groups. However, the Present study's findings support the notion that cupping therapy can enhance muscle Activity, potentially offering a valuable modality for improving muscle performance.

Clinical Implications

The results of this study have important clinical implications. Given the observed benefits in both ROM and muscle activity, cupping therapy can be considered a viable option for Athletes and individuals seeking to improve flexibility and muscle function. It offers a Complementary approach to traditional stretching routines, potentially enhancing overall Treatment outcomes (Lowe, 2017) ^[18].

Research Gap

While both cupping therapy and passive stretching are employed to improve ROM and Muscle function, there is a paucity of research directly comparing their effects, particularly on the hamstring muscles. The hamstrings are crucial for various athletic and daily Activities, and limited flexibility and strength in these muscles can predispose individuals to injuries and impair performance. Therefore, understanding the relative efficacy of these interventions on hamstring muscle function is essential for Optimizing rehabilitation and training protocols.

Limitations and Future Research

The study's sample size was relatively small, and the participants were healthy individuals.

Future research should include larger sample sizes and diverse populations, including Individuals with musculoskeletal conditions. Additionally, long-term effects of cupping Therapy should be investigated to determine its sustained benefits.

Future Directions

Future research should focus on larger sample sizes and extended follow-up periods to determine the long-term effects of cupping therapy. Additionally, exploring the mechanisms underlying the neuromuscular benefits of cupping could further elucidate its therapeutic potential and optimize its application in clinical practice (Markowski *et al.*, 2014) ^[17].

Conclusion

This study highlights that cupping therapy is equally effective as passive stretching in enhancing the flexibility

and muscle activity of the hamstring muscles in healthy individuals. Due to its simplicity of application and demonstrated benefits, cupping therapy can be regarded as a practical and beneficial approach in clinical practice. It holds promise for improving range of motion, reducing discomfort, and optimizing muscle performance.

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