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Comparative Efficacy of IASTM and Cupping Therapy in Alleviating Pain and Enhancing Function in Grade II Adhesive Capsulitis

Harsh Shekhawat[1], Dr.Mohammed Yunus[2], Dr.Ashish Sharma[3]

[1]MPT Orthopaedics, Department of Physiotherapy, Janardan Rai Nagar Rajasthan Vidyapeeth University, Dabok, Udaipur, Rajasthan
[2]Principal, Venkateshwara College of Physiotherapy,Umarda,Udaipur ,Rajasthan
[3]Assistant Professor, Sai Tirupati University, Venkateshwara College of Physiotherapy, Umarda, Udaipur ,Rajasthan

Abstract

Background: Adhesive capsulitis, commonly known as frozen shoulder, is characterized by pain and restricted range of motion due to inflammation of the shoulder capsule. While conventional physiotherapy has been a standard treatment, recent studies suggest that adjunct therapies such as Instrument-Assisted Soft Tissue Mobilization (IASTM) and cupping therapy may offer additional benefits in managing this condition.

Objective: To evaluate and compare the effectiveness of IASTM and cupping therapy, each combined with conventional physiotherapy, on pain reduction, range of motion, and functional disability in patients with Grade II adhesive capsulitis.

Methodology: Thirty participants meeting the inclusion criteria were randomly assigned into two groups of 15 each. Group A received IASTM along with conventional physiotherapy, while Group B received cupping therapy combined with conventional physiotherapy. Both groups underwent a 12-week intervention program. Outcome measures included the Visual Analogue Scale (VAS) for pain and the Shoulder Pain and Disability Index (SPADI) for functional assessment, recorded at baseline and after the intervention. Data were analyzed using paired and unpaired t-tests to determine statistical significance.

Results: Both groups demonstrated significant improvements in VAS and SPADI scores from baseline to post-intervention ($p < 0.001$). However, Group A (IASTM) showed a more pronounced reduction in pain and disability scores compared to Group B (cupping therapy), indicating superior efficacy of IASTM in managing adhesive capsulitis symptoms.

Conclusion: The study concludes that while both IASTM and cupping therapy, when combined with conventional physiotherapy, are effective in reducing pain and improving function in patients with Grade II adhesive capsulitis, IASTM demonstrates greater effectiveness. These findings support the incorporation of IASTM into rehabilitation programs for enhanced patient outcomes.

Keywords: Adhesive capsulitis, IASTM, Cupping therapy, Conventional physiotherapy, VAS, SPADI.

Introduction:

Adhesive capsulitis, commonly known as frozen shoulder, is a condition marked by pain and restricted range of motion in the shoulder joint. Grade II adhesive capsulitis represents a moderate stage where inflammation and stiffness are prominent, significantly impacting daily activities and quality of life. Traditional management includes physical therapy, pharmacological interventions, and, in some cases, surgical procedures.[1]

Instrument-Assisted Soft Tissue Mobilization (IASTM) has emerged as a contemporary therapeutic approach, utilizing specialized tools to apply controlled microtrauma to soft tissues, thereby promoting healing and improving mobility. Studies have indicated that IASTM can effectively reduce pain and enhance functional outcomes in musculoskeletal conditions, including adhesive capsulitis.[2]

Conversely, cupping therapy, an ancient practice rooted in traditional medicine, involves creating suction on the skin to increase blood flow, reduce muscle tension, and facilitate healing. Recent investigations have explored its efficacy in alleviating pain and improving function in various musculoskeletal disorders.[3]

Despite the growing interest in both IASTM and cupping therapy, comparative studies evaluating their effectiveness specifically for Grade II adhesive capsulitis remain limited. Understanding the relative benefits of these interventions is crucial for optimizing treatment strategies.[4,5]

This study aims to conduct a comparative analysis of IASTM and cupping therapy in patients with Grade II adhesive capsulitis, focusing on their impact on pain reduction and functional improvement. By systematically evaluating these modalities, the research seeks to provide evidence-based insights to inform clinical decision-making and enhance patient outcomes.

Methodology:

This comparative study aimed to evaluate the effectiveness of Instrument-Assisted Soft Tissue Mobilization (IASTM) versus cupping therapy in patients with Grade II adhesive capsulitis. A total of 30 participants, aged between 30 and 65 years, were randomly assigned to two groups using simple random sampling:**Group A (n=15):** Received IASTM combined with a standardized exercise program,**Group B (n=15):** Received cupping therapy combined with the same standardized exercise program.The intervention spanned 12 weeks, with treatments administered thrice weekly. Participants were recruited from GBH General Hospital and GBH Memorial Cancer Hospital.

Inclusion criteria were age between 30 and 65 years,Pain duration exceeding three months,Range of motion (ROM) in external rotation, abduction, and flexion less than 50% compared to the contralateral shoulder in one or more directions,Both male and female patients,Provided informed consent to participate. Exclusion criteria included Presence of cervical radiculopathy or other associated musculoskeletal disorders,Rheumatological disorders,History of fractures or tumors in either upper extremity,Received corticosteroid injection in the affected shoulder within the past four weeks,inability to complete the 12-week intervention period.

Outcome Measures and Intervention Protocol: **Visual Analogue Scale (VAS):** A 10-cm line used to assess pain intensity, where 0 represents 'no pain' and 10 represents 'worst imaginable pain.' The distance from the 'no pain' anchor to the patient's mark was measured in millimeters to quantify pain intensity.[6] **Shoulder Pain and Disability Index (SPADI):** A self-administered questionnaire consisting of 13 items divided into two subscales: pain (5 items) and disability (8 items). Scores from both subscales were summed and expressed as a percentage, with higher scores indicating greater pain and disability.[7]

Both groups participated in a standardized exercise program throughout the 12-week period, which included pendulum exercises, internal and external rotation exercises, pulley exercises for elevation, forward flexion, and extension exercises. As patients progressed, these exercises were advanced to include resistance training using therabands and sandbags. Patients were also instructed to perform these exercises at home twice daily to reinforce therapy gains.

Group A received IASTM using the Graston technique, focusing on the upper trapezius and supraspinatus tendon areas. The treatment involved applying the tool at a 30–60-degree angle for 40–120 seconds per area. Sessions lasted approximately 35 minutes and were conducted three times a week for 12 weeks. Patients were advised to apply moisturizer post-treatment and avoid anti-inflammatory agents to allow natural healing processes. Group B underwent oil-based cupping therapy employing both static and dynamic techniques. Cups were applied to the shoulder joint, including the upper trapezius and supraspinatus tendon areas, for about 35–40 minutes per session. Dynamic cupping involved moving the cups to perform a massage-like effect. Sessions were held three times a week for 12 weeks.

Outcome measures (VAS and SPADI) were assessed at baseline, mid-intervention (week 6), and post-intervention (week 12) to evaluate changes in pain intensity and functional disability.

RESULTS

Participant Demographics

A total of 30 patients diagnosed with chronic shoulder pain were enrolled in the study and randomly assigned into two equal groups: Group A (IASTM) and Group B (Cupping Therapy). Demographic characteristics, including age and gender distribution, are summarized in Table 1.

Table 1. Demographic Profile of Participants

Variable	Group A (IASTM)	Group B (Cupping Therapy)
Age (Mean ± SD)	31.33 ± 5.13 years	29.67 ± 6.60 years
Gender (Male)	3:2	7:8

Intervention and Outcome Measures

Both groups underwent a 12-week intervention protocol. Outcome measures were assessed using the Visual Analogue Scale (VAS) for pain intensity and the Shoulder Pain and Disability Index (SPADI) for functional disability, recorded both pre- and post-treatment.

Table 2. Pre- and Post-Treatment Scores

Group	Outcome Measure	Pre-Treatment Mean ± SD	Post-Treatment Mean ± SD	Mean Difference	p-value
A (IASTM)	VAS	6.06 ± 2.2	2.53 ± 3.4	3.53	< 0.05
	SPADI	60.66 ± 20.9	25.33 ± 34.9	35.33	< 0.05
B (Cupping Therapy)	VAS	6.20 ± 4.1	4.50 ± 3.2	1.70	< 0.05
	SPADI	62.00 ± 21.7	45.33 ± 34.0	16.67	< 0.05

Both groups demonstrated statistically significant improvements in VAS and SPADI scores post-treatment ($p < 0.05$). Group A (IASTM) exhibited a greater reduction in both pain intensity and functional disability compared to Group B (Cupping Therapy).

Statistical Analysis

An unpaired t-test was conducted to evaluate the significance of changes within each group. The results are presented in Table 3.

Table 3. Unpaired t-Test Results

Group	Sample Size (N)	Mean Difference	Standard Deviation (SD)	t-value	Degrees of Freedom (df)	p-value	Significance
A (IASTM)	30	35.33	126.6	1.76	28	0.03	Significant
B (Cupping Therapy)	30	16.66	238.0	1.76	28	0.03	Significant

The Unpaired t-test results indicate that both interventions led to statistically significant improvements in patient outcomes ($p < 0.05$). However, the IASTM group demonstrated a more substantial mean difference in both VAS and SPADI scores, suggesting a superior effect in reducing pain and disability associated with chronic shoulder pain.

DISCUSSION

This study involved 30 participants diagnosed with Grade 2 adhesive capsulitis, randomly assigned into two groups: Group A received Instrument-Assisted Soft Tissue Mobilization (IASTM) using the Graston

technique combined with conventional therapy, while Group B received cupping therapy alongside conventional therapy. Both interventions aimed to alleviate pain and improve shoulder function.

The demographic composition of the study was heterogeneous, encompassing both male and female subjects. Future research could benefit from focusing on a homogeneous sample, particularly considering that adhesive capsulitis is more prevalent among females .

Both treatment modalities demonstrated significant improvements in Visual Analogue Scale (VAS) scores and Shoulder Pain and Disability Index (SPADI) scores. Participants reported marked pain reduction and enhanced range of motion post-treatment. Notably, patients described their pain using milder terms following the interventions, indicating subjective relief.

Group A exhibited statistically significant improvements in pain, range of motion, and disability measures. The Graston technique, a form of IASTM, involves using specialized instruments to apply controlled microtrauma to soft tissues, stimulating a localized inflammatory response that promotes tissue remodeling and healing . This method has been shown to increase fibroblast activity, enhancing collagen synthesis and facilitating the breakdown of scar tissue.[8]

These findings align with previous studies. For instance, a study by Kim et al. demonstrated that IASTM, combined with stretching and strengthening exercises, improved soft tissue function and increased range of motion in patients with adhesive capsulitis.[9] Additionally, research by Sharma et al. indicated that IASTM therapy significantly improved pain, function, and quality of life in shoulder injuries.[10]

Group B also showed significant improvements in pain and disability scores. Cupping therapy operates by creating negative pressure, which lifts the skin and underlying tissues, enhancing blood flow and promoting healing . This mechanism aids in the removal of metabolic waste and reduces muscle tension. A study by Yaman et al. found that cupping therapy effectively reduced upper shoulder and neck pain in office workers.[11] Furthermore, research by Abid et al. concluded that dry cupping therapy significantly reduced pain and stiffness while increasing the range of motion in patients with frozen shoulder.[12]

In summary, both IASTM and cupping therapy, when combined with conventional physiotherapy, are effective in managing adhesive capsulitis. IASTM appears to be particularly beneficial in breaking down scar tissue and promoting tissue remodeling, while cupping therapy enhances circulation and reduces muscle tension. Further research with larger, more homogeneous samples is recommended to validate these findings and optimize treatment protocols.

CONCLUSION:

In conclusion, incorporating IASTM into conventional physiotherapy protocols may offer enhanced benefits for patients suffering from adhesive capsulitis, leading to greater reductions in pain and disability compared to cupping therapy.

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