RESEARCH ARTICLE

Effects of core stabilisation exercises with and without dry cupping on pain and disability in patients with sacroiliac joint dysfunction

Noor Ul Ain, Muhammad Salman Bashir, Rabiya Noor, Mehwish Ikram, Ayesha Iftikhar, Rabiah Najm

Abstract

Objective: To determine the impact of core stabilisation exercises with and without dry cupping on aches and impairment in sacroiliac joint dysfunction.

Method: The randomised controlled trial was conducted from June 15, 2022, to November 30, 2023, at the Riphah Rehabilitation Centre, Lahore, Pakistan, and comprised subjects who were randomised into two groups. Intervention Group A received core stabilisation training in addition to dry cupping therapy, while control Group B received core stabilisation training alone. The intervention was done once a week for 6 weeks. Numeric Pain Rating Scale and Modified Oswestry Disability Index were used to assess pain and disability outcomes, respectively, at the baseline and post-intervention. Data was analysed using SPSS 25.

Results: Of the 28 patients, 12(42.9%) male and 16(57.1%) female with mean age 29.86±3.30 years were in Group A, and the remaining 14(50%) with mean age 31.21±3.45 years were in Group B ($p>0.05$). Post-intervention, both groups showed significant improvement ($p<0.05$) compared to baseline values, but Group A values were significantly better than Group B values ($p<0.05$).

Conclusion: Dry cupping therapy with core stabilisation exercise was more effective in reducing pain and improving disability in patients with sacroiliac joint dysfunction than core stabilisation exercise alone.

RCT registration Number: ClinicalTrials.govt with ID: NCT05404984.

Keywords: Dry cupping, Core strengthening exercises, Sacroiliac joint dysfunction. (JPMA 75: 61; 2025)

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Introduction

The malfunctioning of the sacroiliac joint (SIJ) is thought to be one of the common causes of low back pain (LBP) in 15-30% of patients. However, precise diagnosis of SIJ dysfunction (SIJD) can be difficult.[1] The SIJ can be one of the prime causes of discomfort for individuals who have LBP. It has been estimated that up to 75% of people suffer from SIJ pain. The sensitivity and specificity of history, physical examination, and imaging for diagnosing SIJD are frequently low.[2] The International Association for the Study of Pain (IASP) established the criteria for the examination of individuals with suspected SIJD, according to which, pain must be localised to the SIJ region and must be provocative by diagnostic procedures.[3]

Flexion, ABduction and External Rotation (FABER) test, Compression-distraction test, thigh thrust test, Gaenslen test and Patrick test are called SIJ pain provocation tests. SIJD is indicated by 3 or more positive findings from the provocative SIJ tests.[4] Patients with LBP frequently perform core strengthening exercises to overcome pain, impairment and activation of the trunk muscle.[5] During dynamic movements, core muscles play a major role in posture stability and strength. As the deep muscular system in the lumbar and pelvic region is primarily in charge of stabilising the vertebral segments and SIJ strengthening, these muscles may aid in regaining stability.[6]

Therapeutic exercise, which mostly consists of core stability exercises (CSEs), is one of the most prevalent conservative treatments. It can help activate the deep fibres of the lumbar multifidus (MF) muscle by performing low-load isometric activity. When combined with standard physical treatment, CSEs appeared to reduce the severity of pain and enhance cognitive abilities in individuals with particular LBP. The overall effectiveness, however, is unknown.[7-9]

Dry cupping is one of the therapeutic techniques that have been utilised to help patients with chronic LBP in terms of pain reduction, better physical activity, and higher quality of life (QOL). However, recent evidence-based studies supporting the technique are limited.[10] The most popular type of cupping is dry cupping, which uses burning heating power to generate suction. For various therapeutic purposes, several strategies are used. The purpose of cupping therapy is to control and encourage qi and blood mobility. Cupping can alleviate pain brought on by blood stasis and qi obstruction. Cupping can also help with

Riphah International University, Lahore, Pakistan.

Correspondence: Mehwish Ikram. e-mail: mehwish.physiotherapist@gmail.com

ORCID ID: 0000-0001-7382-0243

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microcirculation and muscle spasms.[11] For significant results, a minimum of 5 sessions of cupping therapy are required. The cups must be placed in the treating area for around 8 minutes with an interval of 3-4 days between the sessions.[12] In clinical settings, cupping is commonly found to reduce pain and improve patients' overall sense of wellbeing.[13]

Early systematic analysis has indicated that the cupping technique is beneficial in treating irritable conditions as well, and interest in cupping has grown over the past 10 years.[14] Dry cupping can be utilised as a solo myofascial release technique, but it can also be used in combination with acupoints in a single session. Some acupoints, like BL28 and BL54, and pressure can be helpful in relaxing muscles, promoting blood flow and sedating the nervous system.[15] The cupping treatment has a lot of parallels to stability, but there is not a lot of research to back it up.[16]

The current study was planned to determine the impact of core stabilisation exercises with and without dry cupping on pain and impairment in SIJD patients.

Patients and Methods

The randomised controlled trial (RCT) was conducted from June 15, 2022, to November 30, 2023, at the Riphah Rehabilitation Centre, Lahore, Pakistan. After approval from the institutional ethics review committee, the study was registered with ClinicalTrials.govt with ID: NCT05404984. The sample size was calculated using G*power version 3.1.9.2 calculator[17] with 5 % margin of error, 0.80 power and 1.22 effect size based on literature.[2] The sample size was inflated by 20% to cover for potential dropouts. The sample was raised using non-probability convenience sampling technique. The subjects were enrolled according to inclusion and exclusion criteria. Pain provocation tests were performed, and 3 positive tests out of 5 were considered to diagnose SIJD.

After taking written informed consent, the patients were randomised using the lottery method into two groups. Intervention Group A received core stabilisation training in addition to dry cupping therapy, while control Group B received core stabilisation training alone.

In Group A, patients were asked to lie in a prone position with the arm next to the body. Dry cupping was conducted with an expendable manual cupping equipment that included plastic cups of various sizes and an evacuation pump. The cups were positioned over areas including Huantiao, GB-30, BL-28, BL-54, Pangguangshu, EM-Yaoyan and ZHIBIAN. The participants were asked to remain in a static position as long as possible. After 10 minutes of application, the cups were removed. Each side of the body received a total of 10 minutes of therapy. Negative pressure was exerted on the treatment region created by the suction-produced hyperaemia around the treatment area. After the dry cupping session, core stabilisation exercises were added.[2]

In control Group B, the patients were subjected only to core stabilisation exercises without dry cupping. The prime stabilisers of the lumbopelvic region to ensure segmental control in different positions, like bridging with knee press adduction, bridging with resisted loop abduction, knee to chest with stick, dead bugs, and bridging with march, were introduced. Each exercise was performed in sets of 10 repetitions. The goal was a contraction of the local muscles transverse abdominis (TA) and deep fibres of the MF with normal breathing patterns. Contraction of the TA and MF was monitored by palpating just medial and inferior to the anterior superior iliac spines, and lateral to the spinous process of the lumbar spine or sacrum bilaterally, respectively.[18]

Both the groups received the treatments once a week for six weeks. The patients were assessed at baseline and post-intervention using the Numeric Pain Rating Scale (NPRS) and the Modified Oswestry Disability Index (MODI). Then a physical examination of SIJ was performed by the physical therapist.

The NPRS is a numeric scale ranging from 0 to 10 and the numbers are displayed horizontally. The best number indicating pain intensity is selected, with 0 = no pain, and 10 = the worst possible pain.[19]

The MODI, also known as the Modified Oswestry Low Back Pain Disability Questionnaire, is used to measure a patient's permanent functional disability. The test has 10 sections, with 5 categories in each section. The total possible score is 50, with 0-4 = no disability, 5-14 = mild disability,15-24 = moderate disability, 25-34 = severe disability, 35-50 completely disabled. All 10 sections are scored, and the scores are added up and calculated as a percentage at the end.[20]

Data was analysed using SPSS 25. Shaphiro-Wilk test was used to determine data normality. Parametric and non-parametric tests were decided based on data normality. Intragroup differences were assessed using paired t-test or Wilcoxon signed rank test. Intragroup assessments were done with independent t-test or Mann-Whitney U test. $P<0.05$ was considered statistically significant.

Results

Of the 32 patients enrolled, 28 (87.5%) completed the study, 12 (42.9%) were males, and 16 (57.1%) were females. Three (9.4%) were lost to follow-up, and one (3.1%) refused

dry cupping after two treatment sessions. Of the 28 patients, 14(50%) with mean age 29.86±3.30 were in Group A, and the remaining 14(50%) with mean age 31.21±3.45 were in Group B ($p>0.05$) (Table 1).

Post-intervention, both groups showed significant improvement ($p<0.05$) compared to baseline values, but Group A values were significantly better than Group B values ($p<0.05$) (Table 2).

Table-1: Demographic characteristics

Variables	Core Stabilisation Exercises with dry cupping (Group A) Mean ± Std. Deviation	Core Stabilisation Exercises without dry cupping (Group B) Mean ± Std. Deviation	*p*-value
Age (years)	29.86 ± 3.30	31.21 ± 3.46	0.299
Weight (Kilogram)	72.71 ± 10.62	69.57 ± 10.41	0.437
Height (cm)	5.37 ± 0.31	5.38 ± 0.50	0.965
Body Mass Index (Wt kg/ht cm^2)	27.19 ± 4.10	26.48 ± 6.69	0.738
Gender of the participants			
Values	**n(%)**	**n(%)**	**n(%)**
Females	8/57.1	7/50. 0	16/57.1
Males	6/42.9	7/50. 0	12/42.9
Total	14/100.0	14/100.0	28/100.0

Table-2: Intergroup and intragroup comparison

Outcome Measures NPRS	Group A Mean±S.D	Group B Mean±S.D	Mean difference	*p*-value
Pre-Value	8.28 ± 0.72	8.07 ± 0.91	0.21	0.50
Post-Value	3.28± 1.38	5.42 ± 1.15	2.14	0.00
Mean difference	5.00	2.65		
p-value	0.00	0.00		
MODI	**Group A**	**Group B**	**Mean difference**	**p-value**
Pre-Value	67.43 ± 13.84	61.71 ± 8.44	5.72	0.27
Post-Value	18.29 ± 3.97	36.24 ± 10.13	17.95	0.00
Mean difference	49.14	25.47		
p-value	0.00	0.00		

NPRS: Numeric pain rating scale, MODI: Modified Oswestry Disability Index, SD: Standard deviation.

Discussion

The current study showed significant effects of dry cupping technique which aimed at controlling the correct channelling of the body and flow of fluid. According to the Traditional Chinese Medication theory[21], qi, or vital energy, and blood stagnation are common causes of pain; consequently, clearing away stagnant qi and blood improves pain. Therefore, pain may be reduced when the technique is given in particular places on the body typically through warm patches.[22] The current findings were supported by a previous study, which concluded that conventional therapies, including transcutaneous electrical nerve stimulation (TENS), core stabilisation exercises, and stretching with straight leg raising, were significantly more effective in treating SIJD when combined with dry cupping therapy and kinesio tape than that when used alone. Evidence was supported a recent study which showed the significant effects of core stabilisation exercises on pain and disability when combined with dry cupping in subjects with SIJD.[2]

The current findings were supported by an earlier study which found that individuals with LBP got momentary pain relief and improved disability after just one cupping session.[23] In an experimental clinical trial, participants received actual or pretended techniques for 15 minutes at the points BL-23 Shenshu, BL-24 Qihaishu, and BL25 Dachangshu bilaterally following examination, and they were evaluated right after the application of technique and 7 days later. There was no observable variation among the group's outcomes receiving placebo cupping therapy. As a result, following just one session, cupping therapy effectively reduced LBP and disability

The present study exhibited a noteworthy reduction in pain and improved disability in the subjects receiving cupping therapy. The evidence for using cupping to relieve pain has been reported to be favourable.[24]

The current results were in agreement with those of a previous study in which cupping was efficient compared to acupuncture with needles.[25]

The current findings are consistent with earlier results showing a significant improvement in the measured variables of pain and low back impairment as well as in physical health, psychological health and social interactions. Combining the effects of cupping therapy and traditional physical therapy increased female patients' health-related quality of life (HR-QOL) while also lowering their LBP symptoms. Individuals who were receiving dry cupping therapy for the treatment of LBP showed marked improvement, and a significant difference was observed between the experimental and control groups.[26]

The current results, however, are in contrast with a previous study which concluded that in individuals with no specification of chronic LBP, the dry cupping technique was not more effective than the sham cupping technique at reducing pains, body function, potency, QOL, psychical symptoms, or medicinal use. No secondary consequence of cupping could be demonstrated to have any clinically valuable impact. The results raise concerns about the practical application of the dry cupping technique as an alternative intervention for non-specific chronic LBP.[27]

The current study has limitations. The study was constrained by the potential psychophysiological

component, it prevented the patients from responding appropriately while maintaining the placebo effect. Subjects' previous exposure to dry cupping therapy may have impacted their ability to remain blind. An individual without experience might not have been able to distinguish between treatment with and without dry cupping, but a participant with experience might have been able to. Hence, it is probable that patient blinding was not really executed. Only participants aged 25-35 years were included, which limited the significance of the trial's effects for the older patients.

Conclusion

Dry cupping therapy with core stabilisation exercise was more effective in reducing pain and improving disability in patients with SIJD than core stabilisation exercise alone.

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Author Contribution:
NUA: Concept, design, data collection, analysis, interpretation, writing and final approval.
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MI: Data analysis, interpretation, writing and final approval.
AI, RNJ: Data collection and final approval.