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Cupping therapy versus interferential cupping therapy on mechanical low back pain

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Abstract : background Mechanical low back pain is an important public health problem affecting social and physical performance. **Purpose:** The purpose of this study was to investigate the effect of cupping therapy with interferential therapy on mechanical low back pain. **Subjects:** Sixty mechanical low back pain patients aged from 20-35years of both sexes, randomly divided into three groups, selected from Sohag University Neurosurgery Hospital. **Methods:** group A (Study Group): twenty patients received Cupping therapy in addition to traditional physical therapy. Group B (Control Group): twenty patients received Cupping therapy and Interferential therapy (IFT) in addition to traditional physical therapy.Group C (Control Group): twenty patients received Traditional Physical Therapy. The treatment was applied for four weeks, three sessions per week. Pain was measured by McGill Pain Questionnaire (MPQ), disability was measured byThe Roland Morris Disability Questionnaire and ROM was measured by goniometer before and after the treatment. **Results**: There was a statistically significant decrease in pain, disability in group (B) than other groups with p-value equal (P=0.0001*, 0.0001* and P=0.0001*) respectively. There was a statistically significant increase in flexion and extension ROMs in group (B) than other groups with p-value equal (P=0.0001*, 0.0001* and P=0.0001*) respectively. **Conclusion:** Cupping therapy and Interferential therapy (IFT) in addition to traditional physical therapy can be used as an effective treatment in patients with mechanical low back pain.

Introduction

Low back pain (LBP) is among the most debilitating, expensive, and most common clients' complaints rise during routine physical examinations worldwide. It is widespread in many countries, and is associated with substantial financial costs and loss of quality of life[1]. Chronic lower back pain is generally defined as pain that persists for more than three months. The pain may be progressive, or may occasionally flare up and then return to a lower level of pain. With chronic pain, the exact cause of the pain can sometimes be difficult to determine [2]. Non-specific low back pain (NSLBP) is a mechanical pain of musculoskeletal origin in which symptoms vary with the nature of physical activities [3].

Physical therapy management of low back pain includes, transcutaneous electrical nerve stimulation (TENS), Interferential (IF), Ultrasonic (US) and cold-hot treatments[4]**.** Cupping therapy is a special treatment within traditional Chinese medicine. Due to its characteristics of being easy to learn and apply and having no side effects with effectiveness and safety. Cupping therapy is widely used all over the world, which a vessel is attached to the skin surface by suction in order to prevent and cure diseases. It increase the local blood and

lymphatic circulation and to relieves painful muscle tension [5].

Cupping is a physical treatment used by acupuncturists or other therapists, which utilize a glass or bamboo cup to create suction on the skin over a painful area or acupuncture point **.**It is mostly used in Asian and Middle Eastern countries and has been claimed to reduce pain as well as a host of other symptoms [6]**.**

Cupping therapy can be divided into two broad categories: dry cupping and wet cupping. Dry Cupping Therapy tends to be practiced more commonly in the Far-East whereas wet Cupping is favored in the Middle East and Eastern Europe [7].

Dry cupping therapy involves stimulation of the skin by suction. In this method, a partial vacuum is produced by heat production within the cupping glass after it is applied to the skin. With dry or fire cupping, the cups are applied to the intact skin [5]. By creating suction and negative pressure, cupping has been found to affect the body up to four inches into the tissues, which is used to treat muscle pain and spasms, drain excess fluids and toxins, loosen adhesions, connective tissue and stubborn knots in soft tissue, stimulate blood circulation and bring blood flow to nourish stagnant muscles and skin, enhance the flow of energy, stimulate the peripheral nervous system, activate the lymphatic system, clear colon blockages, help activate and clear the arteries, veins, and capillaries, and improve varicose veins[8]**.**

Akbarzadeh et al., (2014) showed that cupping therapy is effective enough in sedation of pain. Thus, it may be used as an effective treatment for reducing LBP [9]**.**

In another randomized controlled pilot study, it was also found that a single application of traditional cupping might be an effective enough in treatments for improving pain, quality of life, and hyperalgesia in patients suffering from chronic non-specific pain[10].

Electrotherapy, which is a noninvasive, non-pharmacological method involving transcutaneous electrical stimulation, is an additional alternative for low back pain management. The electrotherapy methods most used in clinical practice are interferential currents (IFC)[11].

The basic principle of IF is to utilize the strong physiological effects of the low frequency electrical stimulation of muscle and nerve tissues at sufficient depth, without the associated painful and somewhat unpleasant side effects of such stimulation. The medium frequency currents penetrate the tissues with very little resistance, whereas the resulting interference current (low frequency) is in the range that allows effective stimulation of the biological tissues[12].

A recent systematic review concluded that when IFC combined with other treatments, such as exercises and massage, IFC demonstrates advantages over placebo and non-treatment control groups in reducingthe intensity of pain associated with musculoskeletal disorders. However, little evidence has indicated that the use of IFC alone can reduce the intensity of pain, disability or use of analgesics, or improve function in patients with chronic low back pain[13]**.**

Materials and Methods

Patient's characteristics and general experimental design

Patients: Sixty Patients of both sex (male and female) their age ranged from 20 to 35 years; all subjects had mechanical low back pain were selected from Sohag University Orthopedic Hospital and the study was conducted there between the period of April to August 2016 in Sohag University neurosurgery Hospital. Treatment sessions were 3 times weekly for 4 weeks.

Evaluated parameters

McGill Pain Questionnaire for pain assessment:

The scale contains 4 subscales evaluating the sensory, affective and evaluative, and miscellaneous aspects of pain, responses to which comprise the Pain Rating Index, and a 5-point pain intensity scale (Present Pain Intensity) [14]**.**

Roland Morris Disability Questionnaire (RMDQ): is a reliable and valid instrument for assessing LBP disability. The RMDQ consists of 24 items from the Sickness Impact Profile, adapted for LBP. The questionnaire was scored by summing the number of 'yes' answers, varying from 0 (no disabilities) to 24 (severe disabilities) [15].

Goniometer: is a reliable and valid instrument for assessing range of motion**[16]**.

Treatment procedures:

Patients were assigned randomly into three groups equal in number: Group A: Group (A): patients received Cupping therapy in addition to traditional physical therapy, group (B): patients would receive Cupping therapy and Interferential therapy (IFT), in addition to traditional physical therapy. Participants received 30 minutes of current stimulation. Group (C) received Traditional Physical Therapy consisted of stretching exercises for the back, iliopsoas, and hamstring muscles and strengthening exercises for the abdominal muscles for 30 minutes. They received treatment 3 times per week on alternate days for 4 weeks for a total of 12 sessions.

All sessions were supervised and participation assessed. All patients were free to withdraw from the study at any time. All participants provided their informed consent after receiving a detailed explanation of the study. If any adverse effects had occurred, the experiment would have been stopped and the Human Subjects Review Board would have been informed. However, no adverse effects occurred and so the data of all the patients were available for analysis. The treatment programs were as follows:

1-Group (A): 20patients would receive Cupping therapy in addition to traditional physical therapy. The cupping procedure was then performed as follows: double-walled glass cups (2-6glasses with diameters from 75 to 100 mm) were held inverted, after which each glass was placed on an afflicted area overlying the low back muscle (acupoint: BL23 .This point is located 1.5 cm lateral to the posterior midline, on the level of the lower border of the spinous process of the second lumbar vertebra). As the air inside the cups cooled, vacuums were created, drawing up the skin within each cup. The glasses were removed after 10 to 20 minutes depending on the colour of the circular so-called cupping marks, which range from slightly rose to dark pink[9]**.**

2-Group (B): 20 patients would receive Cupping therapy and Interferential therapy (IFT), in addition to traditional physical therapy .participants would receive 30 minutes of current stimulation 3 times per week on alternate days for 4 weeks for a total of 12 sessions .The technique used would involve a bipolar mode with 2 channels located 5 cm from the L3 and L5 spinous processes. The following parameters would be employed: frequency (4kHz); and pulse duration 130ms [17]**.**

3-Group (C): (Control group) 20 patients would receive Traditional Physical Therapy consisted of stretching exercises for the back, iliopsoas, and hamstring muscles and strengthening exercises for the abdominal muscles for 30 minutes. Three sets of stretching exercises, each involving a 30-sec hold and 30-sec of rest repeated three times, were performed in three sessions per week over four weeks. One set of strengthening exercises, consisting of 10 repetitions with a 5-sec hold, was performed in three sessions per week over four weeks [18]**.**

Results

Statistical analysis was conducted using SPSS for windows, version 18 (SPSS, Inc., Chicago, IL). The current test involved two independent variables. The first one was the (tested group); between subjects factor which had three levels (group A receiving cupping therapy in addition to traditional physical therapy. Group B receiving Cupping therapy and Interferential therapy (IFT) in addition to traditional physical therapy. Group C receiving Traditional Physical Therapy consisted of stretching exercises for the back, iliopsoas, and hamstring muscles and strengthening exercises for the abdominal muscles). The second one was the (measuring periods); within subject factor which had two levels (pre, post). In addition, this test involved four tested dependent variables (pain scale, disability, ROM of flexion, and ROM of extension). Accordingly, 3×2 mixed design MANOVA was used to compare the tested variables of interest at different tested groups and measuring periods. With the initial alpha level set at 0.05.

General Characteristics:

The current study was conducted on 60 patients (30 females and 30 males) suffering from mechanical low back they were assigned randomly into three equal studies groups. Group (A) consisted of 20 (10 females and 10 males) with mean age, weight, height, and BMI values of 27.35±4.23 years, 68.75±7.92 kg, 162.5±7.16 cm, and 26.28±2.46 kg/m^2 respectively. Group (B) consisted of 20 (10 females and 10 males) with mean age, weight, height, and BMI values of 28.8±4.57 years, 71±8.52 kg, 164.6±9.43 cm, and 26.16±1.75 kg/m^2 respectively. Group (C) consisted of 20 (10 females and 10 males) with mean age, weight, height, and BMI values of 27.3±4.32 years, 71.5±10.01 kg, 166.75±7.99 cm, and 25.67±2.12 kg/m^2 respectively. As indicated by the One Way Analysis of Variance (ANOVA), there were no significant differences ($p>0.05$) in the mean values of age, weight, and height among the three tested groups (Table1).

Table 1:Descriptive statistics and One Way Analysis of Variance (ANOVA) for the mean age, weight, height, and BMI values for the three tested groups.

	Group A (N=20)	Group B (N=20)	Group C (N=20)	F-value	P-value	Level of significant
Age(years)	27.35±4.23	28.8±4.57	27.3±4.32	0.756	0.474	N.S
Weight(kg)	68.75±7.92	71±8.52	71.5±10.01	0.546	0.582	N.S
Height (cm)	162.5±7.16	164.6±9.43	166.75±7.99	1.327	0.273	N.S
BMI (kg/m^2)	26.28±2.46	26.16±1.75	25.67±2.12	0.459	0.634	N.S

A. Overall effects

Statistical analysis using 3x2 mixed design MANOVA indicated that there were significant effects of the tested group (the first independent variable) on the all tested dependent variables; pain scale, disability, ROM of flexion, and ROM of extension (F=20.657, P=0.0001*). In addition, there were significant effects of the measuring periods (the second independent variable) on the tested dependent variables(F=1870.412, P=0.0001*). Also, the interaction between the two independent variables was significant, which indicates that the effect of the tested group (first independent variable) on the dependant variables was influenced by the measuring periods (second independent variable) (F=17.941, P=0.0001*) (Table 2).

Table 2:The 3x2 mixed design Multivariate Analysis of Variance (MANOVA) for all dependent variables at different measuring periods among groups.

Source of Variation	F-value	P-value
Groups	20.657	0.0001*
Measuring periods	1870.412	0.0001*
Interaction	17.941	0.0001*

***Significant at alpha level <0.05**.

B. Multiple pairwise comparisons (within and between groups)for each variable

C. Pain scale:

1-Within groups:

As presented in table (3) and illustrated in figure (25), within group's comparison the mean ± SD values of pain scale in the "pre" and "post" tests were 63.15 ±4.97 and 16.5 ±2.39 respectively in the group (A).

Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant reduction of pain scale at post treatment in compare to pre treatment (P-value =0.0001*). As well, the mean ± SD values of pain scale in the "pre" and "post" tests were 63.7 ±4.49 and 8.58±1.93 respectively in the group (B). Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant reduction of pain scale at post treatment in compare to pre treatment (P-value =0.0001*).

Additionally, the mean ± SD values of pain scale in the "pre" and "post" tests were 64.45±4.09 and 25.05±2.43 respectively in the group (C). Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant reduction of pain scale at post treatment in compare to pre treatment (P-value =0.0001*).

2- Among groups:

Considering the effect of the tested group (first independent variable) on pain scale, Multiple pair wise comparison tests (Post hoc tests) revealed that the mean values of the "pre" test among (group A versus B), and (group A versus C) showed no significant differences with (P=1.00, P=1.00, and P=1.00) respectively. Multiple pair wise comparison tests (Post hoc tests) revealed that there was significant difference of the mean values of the "post" test among (group A versus B), (group A versus C), and (group B versus C) with (P=0.0001*, 0.0001* and P=0.0001*) respectively and this significant reduction in favor of group (B) than other groups and in favor to group A than group C.

Table 3: Descriptive statistics and 3×2 mixed design MANOVA for pain scale at different measuring periods among different groups.

Pain scale	**Group A (Mean ±SD)**	**Group B (Mean ±SD)**	**Group C (Mean ±SD)**
Pre	63.15 ±4.97	63.7 ±4.49	64.45±4.09
Post	16.5 ±2.39	8.58±1.93	25.05±2.43
% of change	73.87% ↓	86.69% ↓	61.13% ↓
Multiple pairwise comparisons between pre and post treatment values for pain scale at different groups			
Pre Vs. post	**Group A**	**Group B**	**Group C**
p-value	0.0001*	0.0001*	0.0001*
Multiple pairwise comparison tests (Post hoc tests) for the pain scale among different groups at different measuring periods			
	Group A Vs. group B	**Group A Vs. group C**	**Group B Vs. group C**
Pre	1.00	1.00	1.00
Post	0.0001*	0.0001*	0.0001*

***Significant at alpha level <0.05**

A-Disability scale:

1-Within groups:

As presented in table (4) and illustrated in figure (26), within group's comparison the mean ± SD values of disability scale in the "pre" and "post" tests were 20.55 ±2.01 and 9.45 ±1.5 respectively in the group (A). Multiple pair wise comparison tests (Post hoc tests) revealed that there was significant reduction of disability scale at post treatment in compare to pre treatment (P-value =0.0001*). As well, the mean ± SD values of disability scale in the "pre" and "post" tests were 19.05 ±3.39 and3.88±1.53 respectively in the group (B). Multiple pair wise comparison tests (Post hoc tests) revealed that there was significant reduction of disability scale at post treatment in compare to pre treatment (P-value =0.0001*).

Additionally, the mean ± SD values of disability scale in the "pre" and "post" tests were 20.55±2.41 and 12.5±2.01 respectively in the group (C). Multiple pair wise comparison tests (Post hoc tests) revealed that there was significant reduction of disability scale at post treatment in compare to pre treatment (P-value =0.0001*).

2- Among groups:

Considering the effect of the tested group (first independent variable) on disability scale, Multiple pair wise comparison tests (Post hoc tests) revealed that the mean values of the "pre" test among (group A versus B), (group A versus C) and (group B versus C) showed no significant differences with (P=0.273, P=1.00, and P=0.273) respectively. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant difference of the mean values of the "post" test among (group A versus B), (group A versus C), and (group B versus C) with (P=0.0001*, 0.0001* and P=0.0001*) respectively and this significant reduction in favor of group (B) than other groups and in favor to group A than group C.

Table (4):Descriptive statistics and 3×2 mixed design MANOVA for disability scale at different measuring periods among different groups.

Disability scale	**Group A (Mean ±SD)**	**Group B (Mean ±SD)**	**Group C (Mean ±SD)**
Pre	20.55 ±2.01	19.05 ±3.39	20.55±2.41
Post	9.45 ±1.5	3.88±1.53	12.5±2.01
% of change	54% ↓	79.63% ↓	39.17% ↓
Multiple pairwise comparisons between pre and post treatment values for disability scale at different groups			
Pre Vs. post	**Group A**	**Group B**	**Group C**
p-value	0.0001*	0.0001*	0.0001*
Multiple pairwise comparison tests (Post hoc tests) for the disability scale among different groups at different measuring periods			
	Group A Vs. group B	**Group A Vs. group C**	**Group B Vs. group C**
Pre	0.273	1.00	0.273
Post	0.0001*	0.0001*	0.0001*

B-ROM of flexion:

1-Within groups:

As presented in table (5) and illustrated in figure (27), within group's comparison the mean ± SD values of ROM of flexion in the "pre" and "post" tests were 29.2 ±9.66 and 75.45 ±3.39 respectively in the group (A). Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of flexion at post treatment in compare to pre treatment (P-value =0.0001*). As well, the mean ± SD values of ROM of flexion in the "pre" and "post" tests were 35.23 ±7.3 and 85.29±3.36 respectively the group (B). Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of flexion at post treatment in compare to pre treatment (P-value =0.0001*).

Additionally, the mean ± SD values of ROM of flexion in the "pre" and "post" tests were 29.85±7.22 and 65.8±4.67 respectively in the group (C). Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of flexion at post treatment in compare to pre treatment (P-value =0.0001*).

2- Among groups:

Considering the effect of the tested group (first independent variable) on ROM of flexion, Multiple pair wise comparison tests (Post hoc tests) revealed that the mean values of the "pre" test among (group A versus B), (group A versus C) and (group B versus C) showed no significant differences with (P=0.089, P=0.154, and P=1.00) respectively. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant difference of the mean values of the "post" test among (group A versus B), (group A versus C), and (group B versus C) with (P=0.0001*, 0.0001* and P=0.0001*) respectively and this significant increase in favor of group (B) than other groups and in favor to group A than group C.

Table (5). Descriptive statistics and 3×2 mixed design MANOVA for ROM of flexion at different measuring periods among different groups.

ROM of flexion **(degrees)**	**Group A (Mean ±SD)**	**Group B (Mean ±SD)**	**Group C (Mean ±SD)**
Pre	29.2 ±9.66	35.23 ±7.3	29.85±7.22
Post	75.45 ±3.39	85.29±3.36	65.8±4.67
% of change	100.5% ↑	100.5% ↑	100.2% ↑
Multiple pairwise comparisons between pre and post treatment values for ROM of flexion at different groups			
Pre Vs. post	**Group A**	**Group B**	**Group C**
p-value	0.0001*	0.0001*	0.0001*
Multiple pairwise comparison tests (Post hoc tests) for the ROM of flexion among different groups at different measuring periods			
	Group A Vs. group B	**Group A Vs. group C**	**Group B Vs. group C**
Pre	0.089	0.154	1.00
Post	0.0001*	0.0001*	0.0001*

***Significant at alpha level <0.05**

C-ROM of extension:

1-Within groups:

As presented in table (6) and illustrated in figure (28), within group's comparison the mean ± SD values of ROM of extension in the "pre" and "post" tests were 11.05 ±3.73 and 22.4 ±1.81 respectively in the group (A). Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of extension at post treatment in compare to pre treatment (P-value =0.0001*). As well, the mean ± SD values of ROM of extension in the "pre" and "post" tests were 10.17±3.87 and 27.35±1.86 respectively the group (B). Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of extension at post treatment in compare to pre treatment (P-value =0.0001*).

Additionally, the mean ± SD values of ROM of extension in the "pre" and "post" tests were 11.7±3.77 and 18.85±1.95 respectively in the group (C). Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant increase of ROM of extension at post treatment in compare to pre treatment (P-value =0.0001*).

2- Among groups:

Considering the effect of the tested group (first independent variable) on ROM of extension, Multiple pairwise comparison tests (Post hoc tests) revealed that the mean values of the "pre" test among (group A versus B), (group A versus C) and (group B versus C) showed no significant differences with (P=1.00, P=1.00, and P=0.685) respectively. Multiple pairwise comparison tests (Post hoc tests) revealed that there was significant difference of the mean values of the "post" test among (group A versus B), (group A versus C), and

(group B versus C) with (P=0.0001*, 0.0001* and P=0.0001*) respectively and this significant increase in favor of group (B) than other groups and in favor to group A than group C.

Table(6):Descriptive statistics and 3×2 mixed design MANOVA for ROM of extension at different measuring periods among different groups.

ROM of extension **(degrees)**	**Group A (Mean ±SD)**	**Group B (Mean ±SD)**	**Group C (Mean ±SD)**
Pre	11.05 ±3.73	10.17±3.87	11.7±3.77
Post	22.4 ±1.81	27.35±1.86	18.85±1.95
% of change	100.02% ↑	100.6% ↑	61.11% ↑
Multiple pairwise comparisons between pre and post treatment values for ROM of extension at different groups			
Pre Vs. post	**Group A**	**Group B**	**Group C**
p-value	0.0001*	0.0001*	0.0001*
Multiple pairwise comparison tests (Post hoc tests) for the ROM of extension among different groups at different measuring periods			
	Group A Vs. group B	**Group A Vs. group C**	**Group B Vs. group C**
Pre	1.00	1.00	0.685
Post	0.0001*	0.0001*	0.0001*

***Significant at alpha level <0.05.**

Discussion

The aim of this study was to investigate the effect of cupping therapy versus Interferential cupping therapy on patient with mechanical low back pain. The present study was performed on sixty patients with mechanical low back pain their age ranged from twenty to thirty five years and they were divided into three groups of equal numbers. The entire patients were assessed before and after four weeks of the study by McGill Pain Questionnairefor pain assessment, Roland Morris Disability Questionnaire for assessing LBP disability and goniometer for assessing range of motion.

Experimental group A and B after 4-week cupping and IFC produced significant effects in relation to pain intensity reduction, disability improvement and ROMs improvement. The result of this study is consistent with **Akbarzadeh**[9] in a study conducted in Iran, cupping therapy was introduced as an effective method in sedation to reduce lower back pain.

Contrary to the present study's results **Lin** [19] were unable to demonstrate a significant decrease in LBP following cupping, who reported that Cupping is a form of alternative pain therapy that cupping therapy this technique is the fact that the vacuum force on the particular point to relieve pain and other systemic disorders. Erythema, edema, and ecchymosis are the most common complications; however, they are created on purpose to affect acupuncture point microcirculation.

The results of these studies are compatible with those of the current study. Dry cupping therapy is based on the discharge principle, i.e. moving the waste materials from one place to another. Dry cupping therapy is employed in treatment of various disorders, including excessive menstrual bleeding, edema, scrotal hernia, LBP, sciatica, hydrocele, and nose bleeding [20].

In another randomized controlled pilot study, it was also found that a single application of traditional cupping might be an effective enough in treatments for improving pain, quality of life, and hyperalgesia in patients suffering from chronic non-specific pain [10].

Also **Yoo** [21] reported that; Cupping has been used for a number of ailments. Mainly described as treatment for chronic pain including lower back pain, and headache, it has also been used to treat other nonspecific disease processes including indigestion and menstrual disturbance.

Cupping is beneficial through the effects of cortisol, which reduces stress and dopamine which acts on the reward pathway in the brain. The mechanism is unclear but as cupping affects these neurotransmitters it can only be assumed that pain is reduced in this way. There is also the release of endogenous opioids such as endorphins which gives euphoria so this may make you feel better. Conversely, where along the pain pathways cupping works, whether it is lower down in the spinal cord or higher up in the limbic cortex, is still unknown so further investigations are needed to identify this [22]**.**

Another mechanism could be by 'Counter irritation' which is the process of relieving pressure from deep structures in the body by irritating the superficial skin and transferring it to another structure. This idea is similar to the chinese balance of 'qi' however in this case illness is assumed to be caused by increased pressure in a specific region hence to achieve health the pressure should be relieved [23]**.**

Another idea that is proposed is cited by **Ullah et al** [24] is the 'gate theory of pain' which is when a sensory stimulation of the skin overwhelms the pain gates and reduces pain for a period of time as the message coming from the pain is blocked by higher frequency of impulses and this leads to the closure of the pain gates.

A recent systematic review included five trials two randomized clinical trials (RCTs) and three controlled clinical trials (CCTs)] on the effects of cupping on musculoskeletal problems. Its findings suggested that cupping is effective for treating low back pain [25]**.**

Successful management of musculoskeletal pain is a major challenge in clinical practice. One of the electrotherapeutic techniques used for managing musculoskeletal pain is interferential current therapy (IFC). The results of questionnaire surveys in England, Canada, and Australiahave shown that IFC is widely used by diverse clinicians throughout the world. Interferential current therapy is the application of alternating medium frequency current (4,000 Hz) amplitude modulated at low frequency (0–250 Hz) [26]**.**

A claimed advantage of IFC over low-frequency currents is its capacity to diminish the impedance offered by the skin. Another advantage speculated for IFC is its ability to generate an amplitude modulated frequency (AMF) parameter, which is a low-frequency current generated deep within the treatment area [27]**.**

Interferential current (IFC) is noninvasive, analgesic technique used to relieve pain, reduction of swelling and the restoration of function associated with muscle weakness. IFC is based on the crossing of two different medium-frequency sine waves usually between 4000 and 4100 Hz. The two currents create waves which interfere to produce a beat frequency that is called amplitude modulation [28].

Several theoretical physiological mechanisms such as the "gate control" theory, increased circulation, descending pain suppression, block of nerve conduction, and placebo have been proposed in the literature to support the analgesic effects of IFC. Despite IFC's widespread use, information about it is limited [29]**.**

The application of interferential current in conjunction with exercise has been shown to have analgesic effects**.** It works by stimulating muscle fibers and improve the circulation, thus bringing faster healing of the muscles. During IFC, central inhibition of activity of the sympathetic nerve system and peripheral stimulus habituation [30]**.**

Romani et al., [31] used 20 minutes of IFC on acute low back pain patients. After the treatment, reductions in their pain could be observed using a handheld dynamometer. **Hurley et al.** [32] found significant changes in pain intensity and functional capability. Previously**, Hurley et al.** [33] had achieved significant improvements in acute low back pain intensity by means of different electrode positions.

Gonzalez Roig et al. [34] divided 120 chronic low back pain patients into two intervention groups, in order of arrival: a group that received IFC and a control group that received surface warming. In both groups, the patients underwent twelve ten-minute sessions, together with Williams exercises. All the patients who received IFC obtained pain relief.

In a study **Kaur and Kumar** [35] concluded that interferential currents have an effective result in treating LBP. The advantage of IFC is that it generates low frequency current deep in the area of treatment this as supposed to provide effective relief for patients with pain.

In a randomized clinical trial **Werners et al.,** [36] applied IFC on cases of chronic low back pain and compared its effect with the effect of massage, among 148 low back pain patients. Both groups underwent six ten-minute sessions, but the selection criterion of how long the patients needed to have had their complaint was not described. IFC gave rise to a mean pain reduction of 10% immediately after the treatment and 16% after three months.

The ability of IFS to have an effect on pain pathways has been clearly documented. **Johnson et al.,** [37] demonstrated that IFS could decrease ischemic pain that was induced in young healthy volunteers**.**

Similar studies have shown the beneficial effects of IFS on induced pain in controlled human studies. **Noble et al.,** [38] also demonstrated the ability of IFS to improve blood flow in humans. Similar positive effects of IFS have been demonstrated on back pain and in psoriatic arthritis [39].

Atamaz et al., [40] showed that using physical therapy including IFT can reduce pain more effectively than therapies without electro stimulation. The beneficiary effects of IFT in improving pain and disability have been evaluated in some other disease and have shown a great improvement with its treatment**.**

IFT allows an increased dosage applied in a greater depth because of the body tissue's better tolerance of medium-frequency currents. IFT could stimulate local nerve cells that can have a pain reducing/anaesthetic effect due to potentially blocking the transmission of the pain signals or by stimulating the release of pain reducing endorphins**.** It is possible that both these modalities cause there effects by stimulating nerve cells and making regional changes [41]**.**

Conclusion

Depending on the obtained results, we found that treating mechanical low back pain with combined Cupping and IF therapy showed best results than treating Cupping therapy only to reduce pain level, improve ROM and improve functional activity.

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