



Received on 20 June 2016; received in revised form, 19 July 2016; accepted, 29 July 2016; published 31 July 2016

ANALGESIC EFFECT OF CUPPING THERAPY IN OSTEOARTHRITIS ON TIMELINE: AN OPEN COMPARATIVE CLINICAL STUDY

Shaista Urooj¹, Umar Jahangir^{*2}, Asim Ali Khan² and Fasihuz Zaman²

Central Council for Research in Unani Medicine (CCRUM)¹, Janakpuri, New Delhi- 110058, Delhi, India.
Department of Moalajat², Faculty of Medicine (U), Jamia Hamdard, New Delhi-110062, Delhi, India.

Keywords:

Analgesic, Cervical,
Lumbar, Knee, Cupping therapy,
Osteoarthritis

Correspondence to Author:

Umar Jahangir

Department of Moalajat,
Faculty of Medicine (U), Jamia
Hamdard, New Delhi - 110062,
Delhi, India.


E-mail: umar_jhangir@doctor.com

ABSTRACT: Objective: To evaluate the analgesic effect of dry cupping therapy concerning time at a clinical setting and to compare its impact among cases of cervical, lumbar and knee osteoarthritis (OA). **Method:** A comparative open clinical trial was conducted. The patients were divided into three groups by the joint affected. Group A had patients suffering from cervical OA; group B was of patients suffering from lumbar OA whereas, Group C had patients with knee OA. Each group received dry cupping for 20 minutes around the affected joint for 4 consecutive days. They were followed-up on each sitting to determine the effects of cupping therapy concerning time utilizing both objective and subjective parameters. The assessment was done on each sitting spreading over five days. **Results:** The results of this study show significant and better results in the overall management of OA. Cervical OA was the first to show results followed by lumbar and knee OA respectively, not only in terms of pain relief but also in decreasing stiffness and disability. **Conclusion:** Cupping therapy was efficacious in relieving signs and symptoms of osteoarthritis of all three joints in terms of analgesia, anti-inflammation and resolution of edema. The effect could be seen after the first sitting itself. Cupping therapy caused minimal and temporary side effects like ecchymosis and blister formation. It is recommended that further studies are conducted with larger sample size and for a longer duration.

INTRODUCTION: Pain is the most pronounced symptom of osteoarthritis (OA). OA is a disease of the whole joint with the involvement of both the cartilage destruction and inflammatory components like synovitis and bone marrow lesions¹. Animal studies have indicated the pain to be due to peripheral and central sensitization by inflammatory mediators².

The presence and severity of joint pain correlate poorly with structural evidence of joint damage. Current evidence suggests that OA joint damage predisposes to pain; however, pain perception arises in response to a complex series of underlying neurophysiologic events involving transduction of stimuli, transmission of encoded information, and subsequent modulation of this activity at both peripheral and more central levels³.

This pain is debilitating and the chief complaint of OA. Cupping therapy causes a negative pressure using vacuum. The vacuum pulls the skin and the body fluid from the capillaries thereby, breaching it⁴. This pulling of skin stimulates the baroreceptors in the skin thereby, releasing morphine-like

	<p>QUICK RESPONSE CODE</p>
	<p>DOI: 10.13040/IJPSR.0975-8232.IJP.3(7).314-18</p>
<p>Article can be accessed online on: www.ijournal.com</p>	
<p>DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.IJP.3(7).314-18</p>	

substances (Endorphins), Serotonin or Cortisol which can ultimately lead to pain relief and alter the physiological status of the individual ⁵. Yet another mechanism of analgesia is through diversification. The extravasated blood from the breached capillaries diversifies the metabolites and other chemical agents from the joint towards the skin and subcutaneous tissue (Imala). In case of wet cupping, these are expelled with the blood. Dry cupping is used for diversification, analgesia and providing heat to the affected area ⁶.

The study illustrates the analgesic effect cupping has concerning time on osteoarthritis per say and compares the efficacy between three types of commonly occurring OA viz. cervical, knee and lumber.

MATERIAL AND METHODS: After obtaining the written and informed consent a total of ninety-eight patients were enrolled for the study. The patients enrolled in the study were divided into three groups with Group A having 30 patients suffering from cervical OA; group B had 30 patients suffering from lumbar OA whereas Group C had 30 patients with knee OA. Eight patients dropped out during the study.

The study included patients of both the sexes selected from the OPD of RRIUM, Srinagar. They were clinically and radiologically examined, and a case registration file was maintained separately for each patient from Feb 2012 to March 12. The patients were subjected to dry cupping for 20 minutes around the affected joint for 5 consecutive days. Basic Cupping therapy equipment was utilized including a hand suction pump, plastic cups of varying size according to site and muscularity and anti-septic tools. The patients were followed up in OPD on each day to determine treatment effects utilizing both objective and subjective assessment pre- and post-treatment.

Inclusion Criteria:

- Subjects with osteoarthritis (cervical, lumbar and knee),
- Aged between 20-60 years old.

Exclusion Criteria:

- Subjects with gross deformity.

- Grade IV osteoarthritis (Kellegran and Lawrence Scale).

The Procedure: The following procedure was adopted while performing cupping:

Prior to commencing application of treatment, we ensured that:

- The subjects had complied with the pre-cupping requirements (inclusion criteria).
- Contra-indications were eliminated.

Subjects were explained and subsequently reassured regarding the temporary and minor side effects like ecchymosis and blister formation which may arise due to the procedure. The patients were subjected to dry cupping for 20 min around affected joint for 4 consecutive days ⁷.

Assessment Scales: Two scales for pain assessment were employed viz. the Number Rating Scale (NRS) and the Face, Legs, Action, Cry, Consolability (FLACC) pain scale. NRS was for the patient to assess the pain whereas; the caregiver assessed the pain through FLACC. This was done to minimize bias and to ensure a better assessment of pain. Calculations were done with Biostatistics software instat 3.10 version by tukey test. Percentage change was calculated by $(y_2 - y_1) / y_1 \times 100$ formula.

RESULTS: A total of 98 volunteers consented to take part in the study. Thirty-three patients suffering from cervical OA and 33 patients of lumbar OA were enrolled for Group A and group B respectively. In both, the group's 3 patients dropped out and 30 in each group completed the study, whereas Group C had 2 dropouts from the 32 enrolled patients of Knee OA.

TABLE 1: BREAKUP OF SUBJECTS ENROLLED AS PER THE JOINT INVOLVED

	No. of Patients Enrolled	No. of Patients Completed
Group A	33	30
Group B	33	30
Group C	32	30
Total	98	90

Of the 30 patients suffering from knee OA 28 patients had involvement of both the knees this raised the number of joints involved in group C. Two volunteers dropped because of ecchymosis,

three volunteers dropped out because they registered no response and three volunteers missed the cupping session as per the study protocol and the remaining 90 volunteers completed the trial (n=90) **Table 1**.

Epidemiological Data: The constitution of the 90 volunteers in the study was as follows: Group A male (n=7, 23.33%), female (n=23, 76.67%), Group B and Group C male (n=5, 16.67%), female (n=25, 83.33%) **Table 2**.

TABLE 2: EPIDEMIOLOGICAL DATA

Gender	Enrolled		Completed	
	Male	Female	Male	Female
Group A	8	25	7	23
Group B	6	27	5	25
Group C	6	26	5	25

Age Group: The patients in Group A belonging to age group 20-30 (n=5, 16.67%), 30-40 (n=08, 26.67%), 40-50yrs (n=12, 40%), 50-60yrs (n=5, 16.67%) Group B belonging to age group 20-30 (n=3, 10%), 30-40 (n=08, 26.67%), 40-50 yrs

(n=12, 40%), 50-60yrs (n=7, 23.33%) Group C belonging to age group 30-40 (n=4, 13.33%), 40-50yrs (n=12, 40%), 50-60yrs (n=14, 46.67%) **Table 3**.

Assessment of Results:

Effect on Pain as per Number Rating Scale (NRS): The pain associated with knee OA and Cervical OA responded early to the cupping therapy with a 26% pain relief at first follow up while as in patients of lumbar OA the initial pain relief was at around 17% only. At final assessment, all the three groups exhibited about 70% pain relief as per NRS scale **Table 4**.

TABLE 3: AGE GROUP

Age in years	Group A	Group B	Group C
20-30	05	03	0
30-40	08	08	04
40-50	12	12	12
50-60	5	07	14
Total	30	30	30

TABLE 4: EFFECT ON PAIN AS PER NUMBER RATING SCALE (NRS)

NRS Score	Mean ± SEM					Significance
	BT	1 st F.U	2 nd F.U	3 rd F.U.	AT	
Knee OA (N=23)	9.46±0.24 % of change	8.33±0.30 26.1%	6.65±0.46 29.70%	4.35±0.56 54.01%	2.88±0.55 69.56%	< 0.001***
Lumbar OA (N=24)	9.45±0.23 % of change	7.78±0.39 17.67%	5.98±0.50 36.71%	4.31±0.54 54.39%	2.63±0.56 72.16%	< 0.001***
Cervical OA (N=25)	9±0.37 % of change	6.65±0.47 26.1%	4.48±0.48 50.22%	3.78±0.62 58%	2.46±0.62 72.66%	< 0.001***

Effect on Pain as per Face, Legs, Action, Cry, Consolability (FLACC) Pain Scale: Evaluation based on FLACC scale revealed that the pain response was quite marked at first follow up in case of cervical OA patients while as it was less

remarkable in the knee and lumbar OA patients at the same interval. At final evaluation, all the three groups showed a marked relief with a percentage change ranging between 80-90% **Table 5**.

TABLE 5: EFFECT ON PAIN AS PER FACE, LEGS, ACTION, CRY, CONSOLABILITY (FLACC) PAIN SCALE

FLACC Score	Mean ± SEM					Significance
	BT	1 st F.U	2 nd F.U	3 rd F.U.	AT	
Knee OA (N=23)	6.0±0.38 % of change	4.8±0.40 20%	3.73±0.37 37.83%	1.43±0.37 76.17%	0.6±0.23 90%	< 0.001***
Lumbar OA (N=24)	6.13±0.21 % of change	4.63±0.38 24.46%	2.96±0.47 51.71%	1.9±0.47 69%	0.76±0.28 87.6%	< 0.001***
Cervical OA (N=25)	5.56±0.38 % of change	2.9±0.49 47.84%	2.00±0.44 64.02%	1.4±0.43 74.82%	0.93±0.33 83.27%	< 0.001***

DISCUSSION: The disease is gradual in its onset and usually begins after the age of 40.^{8, 9, 10} This was also evident in our study where the majority of the patients were in the age group of 40-50 years.

This could be because osteoarthritis being a degenerative disorder is more common in this age group. Self-reporting is considered a golden standard in pain assessment. (Starkey, 2013) People

are different and respond differently to pain-inducing stimuli and attempts at pain management. (Eccleston, 2001) This is evident from the difference noted in the NRS and FLACC scale. This corresponds with the findings of Misao *et al.*, 1997 wherein; he concluded that pain must be accessed through different variables to quantify the quantum of true pain in chronic pain. (Misao, Sumihisa, Chlong, Satoru, & Koki, 1997). The analgesic effect of cupping as observed in the study was very discrete. Though, this activity was observed in all types of osteoarthritis the effect was attained at the variable duration and of variable standard.

This diversity in effect can be attributed to factors like:

- **Vascularity of the Site:** ¹¹ Vascularity and degeneration are inversely proportional; hence the more vascular the area, the faster was the relief with cupping. As cervical vertebra is more vascular than lumbar or knee, hence the effect was more rapid in cervical spondylosis.
- **Localized Fat:** ⁶ Localized fat hinders the effect of cupping, there is rarely any fat on the cervical area; however, fat is more deposited in knee hence the effect is knee OA is relatively slow.
- **Increased Room Temperature:** ⁶ Increased temperature causes rapid dissemination of body fluids; these aids in the excretion of unwanted metabolites and aid in relief.
- **Muscular Tensibility:** ⁶ The effect of cupping is not pronounced if the muscles are very lax, as the volume of the cup is filled with the muscle without affecting the vasculature, thereby causing the minimum effect.
- **Anti-persistent Time Series:** ¹² This means on an average more intense pain is followed by lesser pain which is a characteristic of OA.

OA pain reflects a state of altered pain processing such that everyday stimuli are perceived as being painful. These changes arise in response to a critical interaction with particular joint, bone, and periarticular factors that may well vary among individuals. The resultant sensitization of nociceptive pathways at both peripheral and central levels is then dependent on constitutional factors

unique to an individual-such as gender, age, and previous history, as well as environmental factors including culture and lifestyle ³.

It was observed that spinal osteoarthritis like cervical and lumbar was more common (81%) in the region when compared to knee osteoarthritis (18.9%). Cervical and lumbar both these type of osteoarthritis registered 40.5% of patients in each group. This could be because of the traditional sitting arrangement prevalent in the region wherein the spine is rested against the wall. Their domestic chores like cleaning rice or vegetables and houses ensure that they flex their neck and spine for long hours. This cannot be ignored and surely does pose as a predisposing factor.

CONCLUSION: The difference in pain assessment was not much in knee OA where both the groups assessed the same percent relief, however; there was a considerable difference in pain assessment in the lumbar and cervical group from the patient as well as caregiver point of view. Thus more scales for pain assessment and larger study period may have been able to resolve this discrepancy. The study was conducted during winters the effect was very little in the patients on whom cupping was done in early February but as the winters waned off the effect of the therapy was much pronounced.

In some of the cases, the pain did show an anti-persistent time series this could be appreciated in some patients because their analgesic graph increased after an initial decline. However, there must have been some patients in whom this could not be detected as there relapse was after a longer duration. This again could have been resolved with a larger study period. Further studies on OA should bear in mind that the difference in anti persistent feature exhibited by different osteoarthritis.

The sebum, serum, and blood that oozed from the site during dry cupping in the form of blisters, sebum and blood worked as agents of excretion. This amount was not appreciable though, but it did relieve the burden of metabolic waste at that site thus bringing about alleviation in the symptoms.

ACKNOWLEDGEMENT: Nil

CONFLICT OF INTEREST: None declared.

REFERENCES:

1. Schaible HG: Mechanisms of chronic pain in osteoarthritis. *Curr Rheumatol Rep* 2012; 14(6): 549-56.
2. Zhang RX, Ren K and Dubner R: Osteoarthritis pain mechanisms: basic studies in animal models. *Osteoarthritis and Cartilage* 2013; 21(9): 1308-1315.
3. Kidd B: Mechanisms of Pain in Osteoarthritis. *HSS J* 2012; 8(1): 26-28.
4. Spink MS and Lewis GL: *Albucasis on Surgery and Instruments* London: The Wellcome Institute of the History of Medicine 1973.
5. Schulte E: Complementary therapies: Acupuncture: Where East meets west. *Nursing Research* 1996; 59(10): 55-57.
6. Masihi IAQ: *Kitab ul Umda fil Jarrah*. CCRUM; New Delhi, Edition 1st, 1986.
7. Khan A, Jahangir U and Urooj S: Management of knee osteoarthritis with cupping therapy. *J Adv Pharm Technol Res* 2013; (4): 217-23.
8. RC L, Felson DT and Helmick CG: Centre for Disease Control and Prevention. [Online]. 2011 [cited 2012 December Monday]. Available from: www.cdc.gov/arthritis/basic/osteoarthritis.
9. Martin JA and Buckwalter JA: Aging, articular cartilage chondrocyte senescence and osteoarthritis. *Biogerontology* 2002; 257-264.
10. Ramakrishnan S: Osteoarthritis: In *Manual of Rheumatology*. Pispati PK BNNM, editor. Mumbai: Indian Rheumatology Association, Edition 2nd, 2002.
11. Turgut M, Uslu S, Uysal A, Yurtseven ME and Ustun H: Changes in vascularity of cartilage endplate of degenerated intervertebral discs in response to melatonin administration in rats. *Neurosurgical Review* 2003; 26(2): 133-38.
12. Schnitzer TJ, Yeasted R, Huang L, Baliki M and Apkarian A: OA pain shows anti-persistent time series. *Osteoarthritis and cartilage*. 2013; 21(S): S261-S262.

How to cite this article:

Urooj S, Jahangir U, Khan AA and Zaman F: Analgesic effect of cupping therapy in osteoarthritis on timeline: An open comparative clinical study. *Int J Pharmacognosy* 2016; 3(7): 314-18. doi link: [http://dx.doi.org/10.13040/IJPSR.0975-8232.IJP.3\(7\).314-18](http://dx.doi.org/10.13040/IJPSR.0975-8232.IJP.3(7).314-18).

This Journal licensed under a Creative Commons Attribution-Non-commercial-Share Alike 3.0 Unported License.

This article can be downloaded to **ANDROID OS** based mobile. Scan QR Code using Code/Bar Scanner from your mobile. (Scanners are available on Google Playstore)