SYSTEMATIC REVIEW

THERAPEUTIC EFFECT OF CUPPING ON NON-SPECIFIC NECK AND LOW BACK PAIN - A SYSTEMATIC REVIEW

ABSTRACT

BACKGROUND & AIMS

Neck and low back pain are the major musculoskeletal problems effecting people around the globe. Increasing number of researches underpin the effects of cupping in neck and low back pain. However, empirical studies are required to confirm the efficiency of cupping therapy. Therefore, the aim of this review was to examine the efficacy of cupping treatment in non-specific neck and low back pain.

STUDY SELECTION & ELIGIBILITY CRITERIA

This systematic review included Randomised Controlled Trials focused on cupping therapy and its effects on neck and low back pain. Extensive search was performed on Google Scholar, PubMed, MEDLINE and Pedro databases. Studies published from 2009 to 2017 were included.

RESULTS

Eight RCT's with a 659 sample size were selected for review. Compared to other cupping methods 'wet cupping', 'fire cupping' and 'cupping massage' were superior in reducing pain in neck and low back pain $P < 0.001$. However, a few cupping techniques showed relatively less significant $P < 0.133$, $P < 0.05$, and $P < 0.037$ in comparison to previously mentioned methods.

CONCLUSION

Cupping therapy can be beneficial in alleviation of non-specific cervicalgia and lumbago in short-term. However, due to weak evidence and a small sample size, the study was restricted from drawing a definite conclusion. Future high-level evidence and research work is required for confirmative and conclusive recommendation of cupping in clinical settings for musculoskeletal pain.

KEYWORDS

Low back pain, Neck pain, Prevention, Rehabilitation, Spine, Disease, Therapeutic.

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INTRODUCTION

Low back pain (LBP) and neck pain (NP) are among the most common problems people suffer from in their life throughout the world¹. NP is a predominant musculoskeletal condition affecting people of different age groups, including young adult to old age individuals². Almost 60% to 80% of people suffer from LBP at some stage of their life³. Similarly, higher prevalence of neck pain persists in individuals with an average of nearly 50% in their lifetime⁴. Besides these worrying figures, the positive aspect is that people usually recover quickly following an episode of LBP and NP. Etiological factors of NP and LBP are many including inflammatory disease, joint disorder, musculoskeletal origin, degenerative diseases, poor posture, working for extended hours, driving for long durations^{7,8}. Tension headache and migraine attacks are considered as risk factors of NP⁹. Most of the time a generalised term 'LBP' and 'NP' is used in the diagnosis index for a patient suffering from LBP and NP thus, indicating that mostly diagnosis is given as nonspecific LBP, either acute or chronic¹⁰. However, 20% of LBP patients⁵ and 10% of NP patients⁶ suffering from acute pain, go into the chronic phase. Due to chronic LBP, quality of life is compromised, which leads to further deterioration of a person's well-being, social relationship and physical abilities¹¹. Similarly, severe NP attributes to compromised daily activities leading to psychological issues¹². There is limited evidence of definitive treatment for non-specific chronic neck pain¹³. Conventional treatment such as medication and even surgery does not always guarantee the patient will be pain free¹⁴. Usually such patients apply home remedies to reduce their pain and discomfort¹⁵. In a patient population as such, there is a paradigm shift towards complementary therapy such as acupuncture, manual therapy and cupping therapy. In comparison to other pharmacological treatment, cupping therapy is an inexpensive, non-invasive and low-risk modality¹⁶.

Since the last decade, there has been an increase in the trend of using cupping therapy for relieving LBP and NP in Middle East countries and China¹⁷. Cupping therapy is increasingly gaining popularity amongst athletes and Hollywood stars¹⁸. Since almost a decade there is lot of research being conducted on effects of cupping in different clinical conditions^{19,20}. Cupping therapy is an old Chinese technique used for treating musculoskeletal, neuromuscular and other clinical conditions²¹. It has originated from Traditional Chinese medicine that prevailed thousands of years ago²². Cupping therapy is extremely helpful in different musculoskeletal conditions, arthritis, inflammatory disorders and other clinical conditions²³. It is mostly done for relief from LBP and NP. There are different kinds of cupping methods available including holding, moving, shaking, fire and quick cupping. Two most commonly used techniques are "dry and wet cupping"²⁴. Dry cupping is a method in which a plastic or silicon cup is placed on the skin and blood is drawn via suction method²⁵. On the other hand, blood is drawn from lacerated skin into the cup in 'wet cupping'

procedure²⁶. Other techniques used are fire cupping, pulsatile cupping, cupping massage and moving cupping. However, basic principle of cupping is to increase blood flow and body energy²⁷. A systematic review conducted on the effects of cupping on chronic back pain in 2018 concluded a positive impact of cupping in the selected population²⁸. Another review was done regarding the outcome of cupping in the neck pain population only. To date, only one review was done back in 2015 which was suggestive of high-level of scientific studies to affirm the claims of published studies. Heterogeneity in studies and low-quality evidence are suggestive of rigorous appraisal of current literature. Therefore, this review will investigate previous and updated available literature about the effectiveness of cupping in nonspecific NP and LBP.

METHODOLOGY

The systematic review has followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

DATA SOURCES AND SEARCHING STRATEGIES

Following databases were searched; Google scholar, PUBMED, Physiotherapy Evidence Database and Pedro. Since there are limited publications therefore, search was conducted from 2009 to 2020 in order to include all valuable research work. Keywords used were "cupping", "neck pain", and "low back pain". Literature was searched related to various kind of cupping including dry, wet and pulsatile cupping. Moreover, cupping therapy itself or in combination with neck and low back pain were also searched.

ELIGIBILITY CRITERIA OF STUDIES

Searched literature was filtered by time frame. Data from 2009 to 2017 was included. Eligibility criteria for the studies to be included was Randomised Controlled Trials (RCT). Single and double blinded RCT's using any form of control in comparison with cupping were included. Furthermore, cupping therapy of any kind was used including dry cupping; wet cupping; empty cupping; moving cupping; medicinal cupping; needling cupping were examined for its outcome. Studies were excluded if they failed in showing the randomisation process.

DATA EXTRACTION

Pain was used as the main outcome measure in this study regardless of etiology. It must be assessed by Visual Analogue Scale (VAS), McGill Present Pain Index (PPI), and Oswestry Pain Disability Index (ODI) or by any other validated tool for pain measurement that should be self-reported or physician mentioned pain score. Moreover, additional outcomes were explored including quality of life reported by patient or physician.

TARGET POPULATION

Subjects of all age groups with neck and low back pain, either acute or chronic were included to assess the outcome of intervention (cupping) used.

RISK OF BIAS

The quality appraisal of the eligible studies was assessed and risk of bias was measured on six domains comprised of random sequence,

allocation concealment, participants blinding, outcome assessment blinding, incomplete outcome data and selective reporting respectively.

Table-1 Characteristics of Included Studies (N=8)

Study Year	Sample Size	Intervention Group	Control Group	Outcome Measurement Tool	Duration	P-Value
Teut et al ²⁷ . 2018	110 (49.0±13.7 years)	Pulsatile cupping on LBP	Minimal cupping group and no intervention group (Paracetamol was allowed for both groups)	VAS	Twice weekly 4 to 12 weeks	p=0.063 p=0.133
Yazdanpanahi et al ¹⁷ . 2017	150 (25±4.2 years)	Dry cupping on LBP	No intervention	SF McGill pain Questionnaire	Thrice weekly 2 weeks	P<0.05
Saha et al ²⁸ . 2017	50 (52.6±10.3 years)	Cupping massage on NP	Self-directed medical care	VAS	Twice weekly 3 weeks	P<0.037
Chi et al ¹⁴ . 2016	60 (43.6±8.0 years)	Fire cupping on NP	No intervention	VAS	Not mentioned	P<0.001
Albedah et al ²⁹ . 2015	80 (36.48±9.3 years)	Wet Cupping on LBP (Acetaminop hen was allowed)	No treatment, Medication (Acetaminophen) allowed	Numeric Rating Scale	Thrice weekly 2 weeks	P=0.000 1
Lauche et al ¹⁸ . 2013	61 (54.1±12.7 years)	Cupping massage on NP	Progressive muscle relaxation	VAS	Twice weekly 3 months	P<0.001
Cramer et al ³⁰ . 2011	50 (6.17± 12.21 years)	Wet cupping on NP	Self-directed medical care with GP/Orthopedics	VAS NDI	Twice weekly for 2 weeks	P<0.001

Table-2 Risk of Bias of Included Studies (N=8)

Studies	Allocation Randomisation	Allocation Concealment	Baseline Comparability	Subject Blindness	Therapist Blindness	Assessor Blindness	Comparison between group	Follow up	Intention to treat analysis
Teut et al ²⁷ . 2018	✓	✓	✓	✓	x	x	✓	✓	✓
Yazdanpanahi et al ¹⁷ . 2017	✓	✓	✓	x	x	x	x	x	x
Saha et al ²⁸ . 2017	✓	✓	✓	✓	x	x	✓	x	x
Chi et al ¹⁴ . 2016	✓	✓	x	x	x	x	x	✓	x
Albedah et al ²⁹ . 2015	✓	✓	✓	x	x	x	✓	✓	✓
Lauche et al ¹⁸ . 2013	✓	✓	✓	x	x	x	✓	✓	✓
Cramer et al ³⁰ . 2011	✓	✓	✓	x	x	x	✓	✓	✓
Farhadi et al ³¹ . 2009	✓	✓	✓	x	x	x	✓	✓	✓

✓ Indicate low-risk of bias

x Indicate high-risk of bias

? Indicate high-risk of bias

RESULTS

Search Results

Initially when a combination of a search term was used, it showed limited results. When the search term 'cupping therapy' was used on databases, it yielded 1200 results on Google scholar whereas, this number dropped down to 673 when the same keywords were used on PubMed. This trend continued and the figures plunged to 69 at Pedro database. Following reading of relevant headings and abstract, full-text article were stratified. As a consequence, eight studies which assessed cupping therapy effects on neck and low back

pain are selected for review.

Characteristics of Included Trials

From eight included studies, a total of 659 sample size was included. Among selected studies three are conducted in Germany, two in Iran, one in Taiwan, one in Norway and one in Saudi Arabia. All of this research work is published in English. Female percentage in all the included studies is higher (70%) than that of men.

Among selected studies, four are conducted on effects of cupping on low back pain^{17,27,29,31}. Similar

numbers of researches are done in the neck pain population^{14,18,28,30}. Out of eight trials, three studies are done to assess the outcome of wet cupping in NP and LBP^{9,10,25}. Cupping massage effects are examined in NP in two studies^{18,28}. Furthermore, dry cupping, fire cupping and pulsatile cupping techniques are used to investigate the efficacy of cupping in LBP and NP in an individual study^{14,17,27}. No comparison of cupping with sham or other complementary medicine technique were done in two trials^{14,18}. However, only one study had a comparison of cupping with acupressure and control group²¹. On the other hand, patients were allowed to take medications for pain relief with cupping in a control group in four trials^{27,29,30,31}. In the included studies, the primary outcome (pain) is measured by either VAS, Numeric rating scale (NRS), McGill pain questionnaire, Short form MPQ SF-36, and the Present Pain Index (PPI). The description is depicted in *Table-1*.

Risk Of Bias In Included Studies

Almost all the trials used concealed the method of sample randomisation apart from one study which did not mention sample randomisation method¹⁷. That sample were blinded to the intervention in only two studies^{27,28}. On the other hand, therapists were not blinded in all the included research studies. Similarly, assessors in the studies were also non-blinded. Details mentioned in *Table-2*.

Cupping Methods

A variety of cupping techniques are being used in included trials. Wet cupping is used in three research studies^{29,30,31}, whereas two trials were conducted on cupping massage technique^{18,31}. On the other hand, dry, fire and pulsatile cupping methods were used in individual studies. Among all, wet cupping and cupping massage technique appears superior to other methods in terms of reducing pain ($p < 0.001$).

Effects Of Intervention

The effect of cupping therapy was assessed mainly by VAS in multiple studies. It included neck and low back pain. Neck and LBP, both conditions were treated whether it was chronic or acute. Therefore, outcome of cupping was assumed to be gross when assessed by VAS. On the other hand, a couple of trials used different tool such as, short form McGill present pain index to investigate the effects of cupping in patients.

Comparison Of Intervention With Control Group

In the included trials, comparison was done between cupping/treatment group (TG) and control group (CG). Three studies investigated the outcome of wet cupping and compared it with the control group. Firstly, NRS score was found to be statistically significant upon comparison with control group at a 4 weeks' time 24.4 (19.7–29.1) 56.3 (51.6–60.9) P value 0.0001²⁹. Secondly, another study also claimed that the wet-cupping group had significantly lower levels of pain intensity ([95% confidence interval (CI) 1.72–2.60] mean difference = 2.17, $p < 0.01$)³¹. Thirdly, not much statistically significant difference between TG and

CG was found. Mean intensity was 4.45 ± 2.17 , and 4.18 ± 1.90 respectively, group difference at 95% CI was 0.28 (–0.91; 1.46) and p value was 0.64³⁰.

Furthermore, other trials conducted on assessing fire cupping outcome in NP also found a significant difference between TG from 9.7 to 3.6 and CG 9.7 to 9.5, $P < 0.001$ following treatment¹⁴. In addition, dry cupping findings were also convincing following 2 weeks of intervention. Baseline readings in TG 31.8 ± 10.8 , CG 31.8 ± 9.8 , p-value 0.1. This changed dramatically following 2 weeks post intervention in TG 4.1 ± 3.6 , CG 14.0 ± 5.2 , p value 0.001¹⁷.

On the other hand, cupping massage result was not found to be promising when compared baseline figures of TG and CG 49.8 ± 21.8 , 45.1 ± 16.3 and following 3 weeks of intervention 29.9 ± 22.9 , 42.8 ± 15.8 respectively, -14.3 (–27.7; –1.0), P-value 0.037²⁸. Similar results were obtained in the other study as well. VAS at baseline in TG and CG was 55.86 ± 19.7 , 56.36 ± 18.6 respectively. Following 12 weeks of intervention it decreased in TG to 39.86 ± 30.0 , CG 45.26 ± 23.5 and estimate group difference at 12 weeks was -0.16 (–13.90; 13.55) and p value was 0.98¹⁸. Likewise, findings were obtained in the pulsatile cupping technique. Baseline readings of TG and CG were 53.2 ± 7.4 and 59.9 ± 12.8 , following 12 weeks, mean adjusted VAS pain intensity was lower for pulsatile cupping vs. control 15.1 (3.1 ± 27.1), $p = 0.014$ ²⁷.

DISCUSSION

Cupping therapy can be a useful tool in adjunct to available treatment options in complementary medicine therapy. Studies conducted on the effects of cupping in other clinical conditions also acknowledged it to be an effective tool to lessen the pain in chronic and acute conditions. Cupping is found to be effective in treating Fibromyalgia¹⁶, carpal tunnel syndrome¹⁸ and in critical conditions¹⁷. Among different cupping techniques, wet cupping procedure was suggested to be an effective tool in reduction of pain^{9,10,25}. In these studies, pain score dropped dramatically following two weeks of cupping treatment. However, the major disadvantage of these studies was the use of pain medication not only in the intervention group, but also in controlled group. This might be the main factor of swift reduction in pain in both groups. Thus, raising questions upon the direct impact of cupping in alleviation of pain. Additionally, none of these trials used placebo for comparison of their intervention. Thus, it is difficult to confirm the conclusion drawn by the authors of these trials. Similar results were obtained in a study which used the fire cupping technique³. This study has many flaws including no blindness of sample, therapist, and no comparability. Lastly, although the pain intensity reduced in a short time, the overall duration of intervention used was not mentioned, which again places doubt in the mind regarding the clarity of the trial.

Furthermore, other studies also ascertain that pain reduced moderately in people treated by cupping

massage method^{23,26}. Nevertheless, there is a major difference between the outcomes in both trials in terms of pain relief. Pain intensity went down by more than 50% in three weeks²³ only, whereas pain reduced by 25% following three months of treatment in the other trials²⁶ in chronic neck pain patients. Therapists and patients both were not blinded, small sample size and incomparability with other treatment groups are few of the shortcomings of these research work^{23,26}. In comparison to the above excellent outcome, not much of a significant result was obtained when pulsatile cupping intervention was used for up to 12 weeks¹⁹. A similar kind of drawback was found in this study as well as discussed above. In spite of pain medication intake being allowed, the pain score did not decrease much. A whole trial was conducted and concluded by the same therapist involved in cupping. Hence, there is a high chance of bias in the conclusion of the trial. Moreover, various kinds of cupping techniques has been used in the studies. The biggest drawback of wet cupping is that it is not applicable for all people and all age groups¹³. Due to the sparse technique used, it is extremely difficult to confirm which type of therapy is effective in treating NP and LBP. Paucity of high-level of evidence is lacking in the current available literature.

Additionally, all the studies have a small sample size, weak strength of studies and no comparison of cupping with placebo are the major drawbacks of the current literature. Furthermore, a considerable number of people left the study including the experimental group during research work. This raises doubt on the conduct, transparency and efficiency of the study and its outcome.

Similarly, there is ambiguity in the specific points of cupping for LBP and NP. These findings could be due to the fact that it is still not a widely used treatment method in clinical settings around the world. Additionally, many people do not trust complementary medicine techniques due to its lack of evidence. Thus, the sample size remains the core issue in the available studies. As a consequence, implication of cupping therapy in clinical settings cannot be emphasised due to lack of strong evidence.

Besides the above discussed issues, the number of available scientific research is limited. Only eight studies were found for analysis regarding the efficacy of cupping, which is a very low number. More research work has been done, but it is not in English and has not been included in this review. Hence, the limitation of this review is the unavailability of studies to draw a definitive conclusion.

CONCLUSION

Cupping therapy can be a useful adjunct to the other available conventional methods for nonspecific NP and LBP. Current research suggests pain reduction with cupping therapy treatment. However, limited studies, low-quality studies, weak

evidences and a small sample size in published trials are suggestive of future high-quality studies for affirmative conclusion.

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