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Is wet cupping effective in decreasing persistent nonspecific low back pain in adults?

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ABSTRACT

Objective: The objective of this selective EBM review is to determine whether or not "Is wet cupping effective in decreasing persistent nonspecific low back pain in adults?"

Study Design: Review of 3 RCTs published between 2009- current, all in the English language.

Data Sources: Three RCTs analyzed the effectiveness of wet cupping on the reduction of persistent nonspecific low back pain (PNSLBP) compared to a control group using other various analgesic therapies. All studies were found on EBSCOhost and were selected based on relevance to the question and being a POEM.

Outcomes measured: All of the articles analyzed the effectiveness of wet cupping in decreasing persistent nonspecific low back pain. The Present Pain Intensity Scale (PPI), Medication Quantification Scale (MQS), Oswestry Disability Questionnaire/Index (ODQ/ODI), and Numeric Rating Scale (NRS). Statistical significance was measured using ANCOVA, Wilcoxon rank-sum test, independent t tests, and NNT.

Results: All 3 studies showed a statistically significant decrease in low back pain post intervention on at least one measured outcome. Farhadi et al[1] found a statistically significant change ($p<0.01$) on all 3 scales at 3 months post intervention. Albedah et al[3] also found that there was a statistically significant decrease in low back pain ($p=0.0001$) on all 3 scales at both primary end point and follow up. Kim et al[2] showed that this decrease was not significant on the NRS scale, both at primary end point ($p=0.37$) and follow up ($p=0.15$), as well as the ODQ scale at both points of analysis ($p>0.05$). There was a significant decrease in low back pain on the PPI scale at both primary end point and follow up ($p<0.01$).

Conclusion: The RCTs discussed in this review suggest that wet cupping may be an effective treatment for PNSLBP. The inconclusive results in Kim et al complicate the ability to confirm or rebut the hypothesis. Further studies are also warranted to implement a placebo effect, determine the number of sessions for maximum length of analgesia, as well as utilize wet cupping as an additional treatment to other forms of therapeutic modalities.

Keywords: Wet cupping; low back pain

INTRODUCTION

Low back pain is one of the most common, debilitating, and costly complaints during physical exams across the world.[1] Patients with chronic low back pain often seek alternative therapies to help alleviate their symptoms, even without a sufficient amount of evidence to support it.[2] Wet cupping is an ancient technique where a vacuum cup is applied to the skin, and is then removed for a small incision to be made, followed by the replacement of the cup to help "pull" blood and toxins from the wound and eliminate blood stasis.[1,3] This tactic is still used today, although there have been only minimal studies on its efficacy in relieving pain.[1] This paper evaluates three randomized controlled trials that investigate the effectiveness of wet cupping therapy on reducing persistent nonspecific low back pain (PNSLBP) in adults.

According to the world health organization, low back pain affects 80% of people at some point in their life, and is seen in many countries across the world.[1] It may cause a large reduction in quality of life not only by causing pain, but also by limiting one socially and emotionally, causing disruption in the work place, and increasing the risk for medication dependence.[4] When broken down, up to 60% of Americans, 40% of adults in Britain, and 62% of adults in African nations report low back pain experienced at some point.[1] The total cost of low back pain is estimated to be between 100-200 billion dollars a year, two thirds of this being due to decreased productivity and wages.[5] Specifically in Canada, Finland, and the US, more people are unable to work due to low back pain than any other group of ailments.[1] Furthermore, it is estimated to be responsible for up to 2.5% of all outpatient office visits in the US, and the diagnosis of "unspecified back disorder" accounts for 63.5% of all visits to the ED for low back pain.[6]

Low back pain can be a symptom of many etiologies including sciatica, trauma, age related processes, sedentary lifestyle, spinal stenosis, and degenerative discs.[7] However, no

identifiable cause can be found in up to 80% of cases, making PNSLBP a diagnosis of exclusion.[2] It is known that the condition is common, and often debilitating and chronic. It may also be resistant to many therapies to relieve pain, causing patients to seek alternative forms of treatment.[2]

There are multiple therapies aimed at controlling or decreasing the symptoms and severity of low back pain. In western medicine, approaches may include strategies such as physical therapy, modification of physical activity and exercise, bed rest, pain relievers, anti-inflammatories, and surgery.[1] While these treatments are effective for some, many do not find relief, while others experience the negative side effects of medications such as drowsiness, opioid addiction, intestinal ulcers, and liver damage when used chronically.[2,7] Growing evidence suggests that wet cupping therapy may be an effective treatment to decrease low back pain.[2]

OBJECTIVE

The objective of this selective EMB review is to determine whether or not "Is wet cupping effective in decreasing persistent nonspecific low back pain in adults?"

METHODS

The selection of studies to investigate wet cupping on PNSLBP was based on population, interventions, and measured outcomes. Both men and women ages 17 years or older with persistent, nonspecific low back pain were included. To meet the terms "persistent" and "nonspecific", the participants were required to have back pain for at least 4 weeks with no identifiable etiology. All studies focused on wet cupping as the intervention therapy. Various therapies were permitted for the control groups, collectively including physical activity alteration, brochures for exercise, acetaminophen, NSAIDs, muscle relaxants, opioids, spinal manipulation exercises, and bed rest. A reduction in low back pain was analyzed by assessing

present pain intensity, pain intensity within the last week, disability of daily activities, and pain medication quantity, strength, and dosage. All three studies used for this investigation were randomized controlled trials.

The author used the key words “wet cupping” and “low back pain” to carry out the search for this study. All studies used were published in English and in peer-reviewed journals. Each article was researched via EBSCOhost and was selected based on relevance to the question and that its outcome was patient oriented evidence that matters (POEM). Inclusion criteria for this study required that the articles used be randomized controlled trials that were published after 2006, and that the participants were 17 years or older with nonspecific low back pain for at least 4 weeks. Participants were excluded from the study if there was evidence of hematologic disease, anticoagulant use, systemic disease, spinal pathology, cupping therapies in the previous 3 months, or severe, progressive motor weakness. The statistics used from the 3 discussed studies were independent t tests, ANCOVA, NNT, and the Wilcoxon rank sum test. The results given were then analyzed using p values and confident intervals.

4. Table 1: Results –Table of Demographics & Characteristics of included studies

Study	Type	# Pts	Age (yrs)	Inclusion Criteria	Exclusion Criteria	W/D	Interventions
Kim (2011)	RCT	32	20-60	Persistent nonspecific low back pain for at least 12 weeks	• Hematologic/ Systemic disease • Anticoagulant use • Cupping therapies in the previous 3 months • Previous therapies in the previous 2 weeks	3	• Wet cupping 3 times per week for 2 weeks • Treatment points bilaterally at BL23, BL24, BL25
Albedah (2015)	RCT	80	18-60	Persistent nonspecific low back pain for at least 12 weeks	• Hematologic/ Other chronic disease • Anticoagulant use • Wet cupping in last 3 months • Any therapy for PNSLBP in the previous 2 weeks	5	• Wet cupping 3 times a week for 2 weeks • Treatment points bilaterally at BL23, BL24, and BL25
Farhadi (2009)	RCT	98	17-68	Persistent, nonspecific low back pain for at least 4 weeks	• Spinal pathology • Severe, motor weakness, central disc prolapse, pending litigation • Bleeding disorders • Currently receiving wet cupping therapy	12	• First session (Day=0): Between the scapulas • Second session (Day=3): Sacrum area • Third session (Day=6): Calf area

OUTCOMES MEASURED

Each outcome measured was a POEM and was assessed in multiple ways. First, Farhadi et al measured improvement with the Present Pain Intensity Scale (PPI). Using this, patients rated their pain at the current time on a scale from 0 (no pain) to 5 (excruciating pain). This study also assessed the Medication Quantification Scale (MQS) Version III, which measures pain medication used in strength, dose, and quantity. It also assessed the Oswestry Pain Disability Index (ODI) scale, which measures pain specifically in the low back for 10 daily activities on a 0 to 5-point scale. All of these scales were measured at baseline and at 3 months.

Kim et al assessed the outcome of the study using the Numeric Rating Scale (NRS), which is a scale from 0 (no pain)-100 (extreme pain) for pain in the last week. They also assessed outcomes using the PPI scale as mentioned above, as well as the Oswestry Disability Questionnaire (ODQ), the same as the ODI scale, and the number of acetaminophen tablets used. Data was analyzed at baseline, primary end point (2 weeks) and follow up (4 weeks).

Lastly, AlBedah et al used the NRS, PPI, ODQ scales, and the number of acetaminophen tablets used. Not specified for the ODQ scale in the studies above, an answer of 0 would reflect "no pain", while 5 reflects "the most restrictions in daily activities". The data was analyzed at baseline, primary end point (2 weeks), and follow up (4 weeks).

RESULTS

Farhadi et al included 98 men and women between 17-68 years old. Out of these, 48 patients were randomly selected in a double- blind manner to undergo wet cupping treatment, while the other 50 received usual care treatment. In total, 7 participants were lost to follow up in the wet cupping group, while 5 were lost to follow up in the control group. The intention to treat principal, however, allowed the missing data from participants to be analyzed using "the mean of

nearby points" technique. The primary end point of analysis was 3 months. The populations in the intervention and control groups were similar in age, sex, duration of lumbar pain, and prior surgeries. The technique of wet cupping involved 5 controlled steps- primary sucking, scarification, bloodletting, removal, and dressing, and was the same for each patient as outlined in the article. For Phase 1 (day=0), the cups were applied between the two scapulas. In Phase 2 (day=3), the cups were applied to the sacrum region. The cups were then applied to the middle of the gastrocnemius muscles in Phase 3 (day=6). For the third phase, if the pain was unilateral, only the calf on the same side was treated. The control group received treatment and advice including activity modification, acetaminophen, NSAIDs, muscle relaxants, opioids, bed rest, spinal manipulation exercises, and encouragement to return to work.

Independent t tests were used to compare the mean difference between control and the intervention group post intervention, which was statistically significant on all three scales used in the study ($p<0.01$). The mean difference between the two groups was 2.2 on the PPI scale, 15.0 on the ODI scale, and 6.6 on the MQS scale post intervention, as shown on Table 2. In addition, the control group reported almost no change in back pain with the treatment and advice they received.

Table 2: Mean difference, Farhadi et al [1]

	Control	Intervention	Mean Difference; [95% CI]	*p*
PPI Post	2.8	0.7	2.2; [1.7-2.6]	<0.01
ODI Post	30.6	15.6	15.0;[11.2-18.8]	
MQS Post	9.7	3.2	6.6; [3.6-9.5]	

Kim et al included 32 men and women between 20 and 60 years old. Participants were randomized in to either the treatment or control group, with a respective ratio of 2:1. In total, 2 were lost to follow up in the intervention group, while 1 was lost to follow up in the control group. The intention- to- treat principal allowed all missing data to be analyzed through the last-

observation-carried-forward method. There were no significant differences between the two groups in baseline characteristics. Those who were allocated to the intervention group underwent wet cupping treatment 3 times a week for 2 weeks. In this study, skilled practitioners applied the cups bilaterally at BL23, BL24, and BL25. Each session, the two most painful areas to palpation were treated. In the case where there was no tenderness, the bilateral BL35 was used. Both the wet cupping and the control group received a brochure on exercise, including stretching and strengthening techniques and general advice for low back pain. They were allowed up to 500 mg of acetaminophen, but were prohibited from other medications or physical therapy for 4 weeks. The outcome variables were measured using the analysis of covariance (ANCOVA) for the NRS and PPI scales, and the Wilcoxon rank sum test for the ODQ scale. The mean change from baseline to the primary end point was -16.0 in the wet cupping group and -9.1 in the control group. From baseline to follow up, the mean change was -18.2 in the wet cupping group and -9.1 in the control group. The results showed that there was not a statistically significant difference from baseline to primary end point (p=0.37) or baseline to follow up (p=0.15) on the NRS scale between the two groups, as shown on Table 3.

Table 3: Change in NRS mean from baseline, Kim et al [3]

	Wet Cupping	Control	*p*
NRS Baseline	58.1	52.73	
NRS Primary End Point	42.1	43.63	
NRS Follow Up	39.9	43.63	
Change in Mean from Baseline to Primary End Point (2 weeks); [95% CI]	-16.0; [-24.4 to -7.7]	-9.1; [-18.1 to 0.1]	0.37
Change in Mean from Baseline to Follow up (4 weeks); [95% CI]	-18.2; [-26.0 to -10.4]	-9.1; [-17.4 to-0.8]	0.15

The changes from baseline to primary end point did show a statistically significant difference between the wet cupping and control groups on the PPI scale for both primary end

point and follow up ($p<0.01$). The mean change for the wet cupping group vs. the control group was -1.2 and -0.2 at primary end point, and -1.3 and -0.4 at the follow up, respectively.

Table 4: Change in PPI mean from baseline, Kim et al [3]

	Wet Cupping	Control	*p*
PPI Baseline	2.43	1.91	<0.01
PPI Primary End Point	1.23	1.71	
PPI Primary Follow Up	1.13	1.51	
Change in Mean from Baseline to Primary End Point (2 weeks); [95% CI]	-1.2; [-1.6 to 0.8]	-0.2; [-0.8 to 0.4]	
Change in Mean from Baseline to Follow up (4 weeks); [95% CI]	-1.3 [-1.7 to -0.8]	-0.4 [-1.0 to 0.3]	

The change in mean from baseline to primary end point on the ODQ scale also showed no statistically significant difference between the intervention and control group at both primary end point and follow up ($p>0.05$). The change in the wet cupping vs. the control group was -5.6 and -1.8 at primary end point, and -7.3 and -4.9 at follow up, respectively.

Table 5: Change in ODQ mean from baseline, Kim et al [3]

	Wet Cupping	Control	*p*
ODQ Baseline	47.9	48.0	P>0.05
ODQ Primary End Point	42.3	46.2	
ODQ Primary Follow Up	40.6	43.1	
Change in Mean from Baseline to Primary End Point (2 weeks); [95% CI]	-5.6; [-8.9 to -2.3]	-1.8; [-5.8 to 2.2]	
Change in Mean from Baseline to Follow up (4 weeks); [95% CI]	-7.3 [-10.9 to -3.7]	-4.9 [-10.8 to 1.0]	

Albedah et al included 80 participants, both male and female between the ages of 18 and 60 years old. In total, 3 participants in the intervention group and 2 participants in the control group were lost to follow up, however because the intention to treat concept was used, the last-observation-carried-forward method allowed for all participants' data to be analyzed. All baseline characteristics for both groups were similar. Patients that were selected to be in the

intervention group received wet cupping therapy 3 times a week for 2 weeks. The details of the procedure paralleled those described in Kim et al and the same points of analysis were used. The control group received no wet cupping treatment, and other than 500 mg of acetaminophen tablets per day, both groups were prohibited from medications, other forms of therapy, and physical therapy. There was also no advice for strengthening or stretching exercises. The outcome variables were analyzed using analysis of covariance (ANCOVA) and Wilcoxon rank-sum test. On all three scales, the difference in scores between the intervention and control group at both primary end point and follow up were statistically significant, p=0.0001, as displayed on Table 6. The NRS scores for the intervention vs. the control group were 29.2 and 57.9 at primary end point and 24.4 and 56.3 at follow up, respectively. The ODQ score for the wet cupping group vs. the control group was 19.6 and 35.4 at two weeks, and 15.2 and 35.9 at 4 weeks, respectively. The PPI scores for the wet cupping group vs. the control group was 1.17 and 2.3 at two weeks and 0.98 and 2.3 at 4 weeks, respectively. The NRS and ODQ scales had an ABI of 0.750 and 0.575, respectively. For these two scales, NNT=2, meaning that the treatment effect was large. The PPI scale did not give results to determine the NNT.

Table 6: Mean Scores at Primary End Point and Follow Up, ABI, NNT Albedah et al [2]

	Scores of 3 Scales		ABI	NNT	P value
	Wet Cupping	Control			
NRS day 14 (95% CI)	29.2 (24.6,33.8)	57.9 (53.3,62.6)	0.750	2	0.0001
NRS day 28 (95% CI)	24.4 (19.7-29.1)	56.3 (51.6-60.9)			
ODQ day 14 (95% CI)	19.6 (16.5-22.7)	35.4 (32.3-38.5)	0.575	2	
ODQ day 28 (95% CI)	15.2 (11.6-18.8)	35.9 (32.3-39.5)			
PPI day 14 (95% CI)	1.17 (0.96-1.4)	2.3 (2.1-2.7)			
PPI day 28 (95% CI)	0.98 (0.7-1.2)	2.3(2.1-2.6)			

DISCUSSION

Low back pain is a very common complaint experienced by adults and is often refractory to Western medicine and treatments. In Farhadi et al and Albedah et al, all scales measured

suggested that wet cupping may be an effective treatment for the reduction of low back pain. The results were more inconclusive in Kim et al, however, all three studies showed a reduction in low back pain in at least one of the outcomes measured. The articles discussed assessed specifically nonspecific low back pain, however another pilot study by Arslan et al showed promising results of wet cupping therapy in neck and shoulder pain as well.[8] In addition, wet cupping has also been used in diagnosed conditions that can cause back pain such as fibromyalgia, cervical spondylosis, and disc herniation.[9] This technique has also been used for a wide range of conditions such as hypertension, rheumatoid arthritis, headaches and migraines, skin conditions such as vitiligo and herpes zoster, and pain associated with dysmenorrhea, trigeminal neuralgia, osteoarthritis, gout, and carpal tunnel.[9]

The cost of wet cupping may be a barrier to treatment for those suffering from low back pain. In most cases, insurance companies will not cover cupping therapy because it is considered alternative medicine.[10] The cost of this therapy varies between the number and length of sessions as well as where it is done, but can be anywhere from $25 to $150 per session.[10] The most common adverse effect from wet cupping is scarring, but most side effects are mild to moderate in severity and can be prevented by proper hygiene, following infection control guidelines, and using well-trained professionals.[11] In Farhadi et al, 3 patients experienced fainting during the intervention, while there were no adverse events in Kim et al or Albedah et al.[1,2,3] Wet cupping is contraindicated in serious conditions such as cardiac failure, renal failure, diseases pertaining to the liver, and hemorrhagic disease.[12]

There were multiple limitations of all three studies that must be considered when determining the efficacy of wet cupping on the reduction of low back pain. For one, there was no placebo effect in any of the studies to blind the patients of knowing which treatment they were

receiving or to reduce bias. In addition, the success of all three studies was based on subjective data, leaving the possibility of the scores being based on previous opinions or experiences of wet cupping. Also, the longest period of time to determine efficacy was in Farhadi et al and was only 3 months. It is possible that the results in Kim et al may have been more conclusive given a longer follow up period. The rapport between the participants and therapists should also be considered, as positive or negative interactions could skew the results of the study. Kim et al had additional limitations that the other studies did not have, such as the small sample size. Also in this study, both groups were given exercises and stretching advice, which could explain the non-significant changes on the NRS and ODQ scale from baseline to post intervention.

CONCLUSION

The results of these studies suggest that wet cupping may be an effective treatment in the reduction of persistent nonspecific low back pain in adults. Despite the promising data in Farhadi et al and Albedah et al, the conflicting results in Kim et al make it difficult to verify or rebut the hypothesis. Additional research attempting to reduce some of these limitations should be conducted. One way to eliminate the bias of simply favoring the intervention would be to compare wet cupping to other forms of controlled intervention, including both holistic and/or medical treatments. Trials assessing wet cupping as an additional form of therapy to other treatment modalities for low back pain may also further support its efficacy. Upon its further development, the use of sham cupping[13] may be able to provide a placebo and allow future studies to be blinded. Further studies are warranted not only to continue to work towards eradicating these limiting factors, but also to analyze how often wet cupping should be performed and how this may affect the length of analgesia for those with persistent nonspecific low back pain.

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